

Chemical quality of Plane Ice-cream marketed in Agra City

AJEET KUMAR, M.L. BHASKAR, BHIMSEN, REJESH KUMAR PAL¹, M.V. SHAH² AND UPENDRA SINGH³

Dept. of A.H. Dairying, R.B.S. College, Bichpuri, Agra.

Abstract

A study was carried out during the year 2013-14 in the department of A.H. & Dairying, R.B.S. College, Bichpuri, Agra to assess the chemical quality of Plane Ice-cream collected from various sources as cream bell, Madhu ice-cream and dairy fun in Agra city and compared with BIS specifications. It was found that all plane ice-cream samples collected from different sources did not meet the BIS specifications in chemical attributes of quality. However, the samples from cream bell were superior in all respect of quality to other samples.

Key words: Ice-cream, Markets, Fat, Sucrose and Ash.

Introduction

Besides ability and experience of the researcher, the development of processed food also requires a proper understanding of the major phenomena that dictate the interactions among different ingredients to achieve the desired characteristics of the final product (Silva Junior et al. 2011). Ice-cream is the frozen product obtained from cow or buffalo milk or a combination there of or from cream and/or other milk product. With or without the addition of cane sugar, dextrose, liquid glucose and dried liquid glucose, eggs, fruits, fruit juices, preferred fruits, nuts, chocolate, edible flavors and permitted food colours, it may contain permitted stabilizers and emulsifiers, not exceeding 0.5% by weight. The mixture shall be suitably heated before freezing the product shall contain not less than 10% milk fat, 3.5% protein and 36.0 percent total solids except that when any of the aforesaid preparation contains fruits or nuts or both, the content of milk fat shall not be less than 8.0% by weight.

The composition of Ice-cream varies depending on the market requirement and processing conditions. Although the quality of final product depends largely on processing and freezing parameters, the ingredients also play an important role. Ice cream as an industry in India and considered as luxury food item which is not made in very large quantity. In the year 1986-87, only 0.7 percent of total milk production (43.9 million tons) was consumed for ice-cream making whereas the consumption of milk ice-cream making in united

states was 9 percent of the total milk production.

The nutritious food must contain protein, fat, sugar, minerals such as calcium, phosphorus and other salt and vitamins, necessary for normal growth only few exceptions. These nutrients are found in sufficient quantity in milk and also in ice-cream. Ice-cream contain 3-4 times as such fat and about 12-16 percent more protein than those milk. Ice-cream is a palatable nutrition healthful and relatively inexpensive food.

The chemical quality of ice-cream in India is deplorably poor, therefore the study of fundamentals facts about all enormous losses from economic, health and nutrition aspects is very essential. In the light of above facts the present study entitled Physico-chemical quality of ice-cream was conducted to record the quality of ice-cream sold by standard manufactured cream bell, Madhu and Dairy fun of different market of Agra city was carried out in the deptt. of A.H. & Dairying, R.B.S. College, Bichpuri, Agra.

Materials and Methods

The sample of ice-cream without colour were collected from standard and ordinary plants of 3 different shops i.e. Cream-bell, Madhu and Dairy fun of Agra city. The sample of 100 gm size cups were collected. The cups was randomly selected and carried to the laboratory. The sample was stored in the freezing chamber of the refrigerator till taken up for analysis. The sensory quality of ice-cream was examined by a panel of judges drawn from the deptt. of A.H. & Dairying using 100 point score card. The chemical analysis of samples was done in terms of Acidity, Fat, Protein, Sucrose, Ash and Total solids by the methods cited by ISI:1165(1967), ISI:4079(1967) and A.O.A.C (1970). Investigation was replicated forth times and

¹ Dept. of A.H. & Dairying, T.D.P.G. College, Jounpur (UP).

² Dept. of A.H. & Dairying, B.R.D. College, Deoria

³ Deptt. of A.H. & Dairying, Survardaya Mahavidhyalaya, Chaumuha, Mathura

the data thus obtained were subjected to statistical analysis and tested at 5% and 1% level of significance.

Results and Discussion

The perusal of data in Table 1 reveals that the acidity content of ice-cream samples collected from cream bell, Madhu and dairy fun were found to be 0.22 ± 0.001 , 0.24 ± 0.002 and $0.25\pm 0.001\%$, respectively. The sample of ice-cream from various factories meets the BIS standards in their acidity content. The statistical analysis revealed that the difference in acidity content among the market samples was insignificant. However, the samples of ice-cream collected from various sources had higher acidity as compared.

The fat content of ice cream sample collected from cream bell, Madhu and dairy fun were found to be 8.92 ± 0.46 , 8.44 ± 0.39 and 7.94 ± 0.33 percent, respectively. The sample of ice-cream from various factories did not meets BIS requirements. The BIS had laid down 10.00 percent minimum fat content in ice-cream. The results of present study on fat content of ice-cream samples from various sources were quite low with that of above authors. The difference in fat

2.74 ± 0.01 percent that recorded in samples from Madhu and dairy fun. The higher ash content in the product could be due to mixing of foreign materials during manufacturing of the product. The overall market samples were differ significantly ($p\leq 0.01$) each other. The total solids content of Ice-cream collected from cream bell, Madhu and dairy fun were found to be 34.94 ± 0.99 , 35.18 ± 1.21 and 34.73 ± 1.18 percent, respectively. However, the difference in total solid content was insignificant and lower than BIS requirements. The BIS specification have laid down minimum 36% total solid content in ice-cream.

The results of present investigation revealed that all the brands of Ice-cream did not meet BIS requirements for chemical quality. However, the sample of cream bell was good as compared to Madhu and dairy fun. The good quality ice-cream can be produced by maintaining hygienic conditions during production, packaging, storage and transportation and sale of the product.

References

A.O.A.C.(1970), Official Methods of Analysis

Table 1: Chemical composition of Plane Ice-Cream Marketed in Agra City

S.No.	Dairy/Brand	Acidity (%)	Fat (%)	Protein (%)	Sucrose (%)	Ash (%)	T.S. (%)
1.	Cream Bell	0.22 ± 0.001	8.92 ± 0.46	5.06 ± 0.11	18.93 ± 1.03	2.03 ± 0.01	34.94 ± 0.99
2.	Madhu	0.24 ± 0.002	8.44 ± 0.39	4.62 ± 0.08	19.91 ± 0.88	2.21 ± 0.01	35.18 ± 1.21
3.	Dairy Fun	0.25 ± 0.001	7.94 ± 0.33	4.49 ± 0.14	19.56 ± 0.93	2.74 ± 0.01	34.73 ± 1.18
4.	BIS (she)	0.25	10.00	-	15.00	-	36.00
	Overall average	0.23 ± 0.001	8.43 ± 0.38	4.72 ± 0.11	19.37 ± 0.94	2.43 ± 0.01	34.95 ± 1.12
	Test of significance	1.233 ^{NS}	5.206 ⁺⁺	4.683 ⁺⁺	8.372 ⁺⁺	6.312 ⁺⁺	1.173 ^{NS}

Note : NS = Non-significant

++ = Significant $p\leq 0.01$

content of Ice-cream from different sources was significant at $p\leq 0.01$. The protein content in Ice-cream samples collected from cream bell, Madhu and dairy fun were found to be 5.06 ± 0.11 , 4.62 ± 0.08 and $4.49\pm 0.14\%$, respectively. The protein content of Ice-cream collected from different sources differ significantly. The protein content in present investigation should higher percentage than reported by person et.al 1985 and Keller et.al 2007. The sucrose content of Ice-Cream samples collected from cream bell, Madhu and dairy fun were found to be $18.93\pm 0.1.03$, 19.91 ± 0.88 and $19.56\pm 0.93\%$, respectively. The samples collected from different markets were also differing significantly. All the above market sample of ice-cream contain higher percentage of sucrose than BIS requirement. It is due to achieve more profit and increasing amount of products because sucrose have low cost than other ingredients. The ash content 2.03 ± 0.01 percent was recorded in samples from cream bell which was lower than 2.21 ± 0.01 and

Association of official Agricultural chemists.11Ed. Washington, D.C.

I.S.I. (1967). IS:1165 specification for milk power (whole and skim). Indian Standards Institution, Manak Bhawan, New Delhi-1.

I.S.I. (1967). IS:4079. Specification for canned rasgolla. Indian Standards Institution, Manak Bhawan, New Delhi-1.

Keller, J.J. Steinmen, M.L. and Wentzel, B.S.(2007). Quality of south Africa ice-cream, cited from Dairy Sci. abstract 70(1) :412.

Persons, J.G Dyhing, S.T., Caler, D.S.K., Spurgeon, K.R. and Seas, S.W.(1985). Acceptability of ice-cream made with processed whey's and sodium caseinate J. of Dairy Sci. 68 (1) : 10.

Silva Junior, Elieste\ Da and Suzana Caetano Da Silva Lannes (2011). Effect of different sweetner blends and fat type on Ice-cream properties. J. food science and technology 31 (1): 211-14.