

# Studies on sensory evaluation and shelf-life of herbal softy ice cream

KAVITA GHODEKAR, R.R. SHELKE, P.A. KAHATE AND S.T. INGLE

The present investigation was conducted to study the sensory and microbial changes occurred in herbal softy ice cream during storage at deep freeze temperature condition ( $-18\pm 1^{\circ}\text{C}$ ). Herbal softy ice cream was prepared by blending 4 per cent Ginger juice and different levels of Turmeric powder 0, 0.2, 0.4, 0.6 and 0.8 per cent *i.e.* in treatment  $T_1$ ,  $T_2$ ,  $T_3$ ,  $T_4$  and  $T_5$ , respectively Herbal softy ice cream was poured into plastic containers and then stored at deep refrigeration temperature to detect keeping quality of herbal softy ice cream. On the basis of sensory evaluation herbal softy ice cream prepared from blending of 4 per cent Ginger juice and 0.4 per cent Turmeric powder ( $T_3$ ) was found superior and accepted extremely by the panel of judges. On the basis of data obtained in present investigation during storage of sensory evaluation of herbal softy ice cream prepared from blending of 4 per cent Ginger juice and different levels of Turmeric powder, it was found that ice cream is accepted only up to 25<sup>th</sup> day of storage under deep freeze condition. Then after on the basis of flavour, taste and overall acceptability it was rejected by the panel of judges, in all 4 per cent Ginger juice and 0.4 per cent Turmeric powder blending was found superior. Further during microbial studies it was recorded that the standard plate count, yeast and mould count and coli form count was increased during storage. But softy ice cream prepared from 4 per cent Ginger juice and 0.4 per cent Turmeric powder blending was found superior for microbial quality, might be due to antibacterial values of turmeric powder.

**Key Words :** Herbal, Ginger, Turmeric, Ice cream, Sensory evaluation, Keeping quality, Standard plate count, Yeast and mould count, Coli form count

**How to cite this article :** Ghodekar, Kavita, Shelke, R.R., Kahate, P.A. and Ingle, S.T. (2016). Studies on sensory evaluation and shelf-life of herbal softy ice cream. *Food Sci. Res. J.*, 7(1): 21-26.

## INTRODUCTION

Dairying in India is diversified and agriculture based stepping stone towards socio-economic progress. The interdependence of Dairy and Food Industries is known since ancient times. This is due to the fact that no single food provides all the nutrients in the right quality for good health. It has been an established fact that the use

of improper food perhaps the root cause of every disease. Still, despite good nutritional and medicinal significance, some spices based milk delicacies remain confined to the domestic kitchen segment. This has the potential to alleviate the persistent malnutrition and unemployment problem in India. Vegetables and spices have probably more important nutritive and medicinal value than any other group of foods for Indians. Additionally vegetable add appetizing, colour, texture and flavour to the daily food and dairy products.

Ice cream is the major dairy product which is one of the favorite food items in large segments of the population. It is a nutritionally enriched frozen dairy product consumed by all age groups particularly children

### MEMBERS OF RESEARCH FORUM

#### Author for correspondence :

**R.R. SHELKE**, Department of Animal Husbandry and Dairy Science, College of Agriculture, Dr. Panjabrao Deshmukh Krishi Vidhyapeeth, AKOKA (M.S.) INDIA  
Email : [rpskv@gmail.com](mailto:rpskv@gmail.com)

#### Associate Authors' :

**KAVITA GHODEKAR, P.A. KAHATE AND S.T. INGLE**, Department of Animal Husbandry and Dairy Science, Dr. Panjabrao Deshmukh Krishi Vidhyapeeth, AKOKA (M.S.) INDIA

mostly during summer (Sharif *et al.*, 2005). Ice cream is highly palatable and nutritious food. One serving of a good Ice cream at average composition (100 g) supplies approximately 200 calories, 4 g protein, 0.13 g calcium, 0.105 g of phosphorus, 0.1 mg iron, 490 IU Vit A, 0.38 mg thiamine and 0.24 mg riboflavin (Bhandari, 2001). It is the product liked invariability by one and all popular throughout the world. The annual growth rate of Ice cream is 10-15 per cent (Chennegowda, 2002 and Singh *et al.*, 2003).

Ginger and Turmeric has been used as a spice and medicine in India and China since ancient time. In India Turmeric is being used from Vedic period and is called 'Maha Aushidhi' (meaning great medicine). According to Karkhele (2003) ginger ice cream was prepared with different levels of ginger juice *i.e.* 1, 2, 3, 4 and 5 per cent w/w, respectively in ice cream and 0.15 per cent glycerol monosterate and recorded that a natural herb ginger increase the aroma, taste and appetite with the variation in properties of ice cream within a close range, which ultimately did not give bad effect on body, texture and sensory quality of ice cream up to 4 per cent ginger juice incorporation. Turmeric (*Curcuma longa* L.) is known as traditional drugs that can cure several diseases such as dyslipidemia and diabetes. Many studies on individual usages of Turmeric have been done previously. Preclinical study showed that combination of both Turmeric and garlic substances gave a better result compared to their individual usage (Sukandar *et al.*, 2010).

Considering the importance of herbal ice-cream present investigation was planned and undertaken with major objectives to assess the sensory evaluation and studied the microbial changes of herbal softy ice cream during storage.

## METHODOLOGY

The present investigation was undertaken during 2014-2015 in the Department of Animal Husbandry and Dairy Science and Department of Plant Pathology, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra.

All ice cream samples were prepared as per the method given by De and Ray (1982). During first step acceptable level of Ginger juice was evaluated first (as 0%, 2%, 4%, 6%, 8% blends) by sensory evaluation of softy ice cream and it was found that 4 per cent ginger

juice blended ice cream was superior, accordingly 4 per cent level of ginger juice blend was used as base for further studies of turmeric powder blends. During second step acceptable level of Ginger juice blend (4%) was used as base to evaluated the level of Turmeric powder (0.0%, 0.2%, 0.4%, 0.6% and 0.8% blends as T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub>, respectively) by sensory evaluation in softy ice cream as shown in treatment details. Samples of Ice cream were stored under deep freeze refrigeration temperature condition (-18±1°C).

Sensory evaluation of Herbal softy ice cream was carried out on the basis of 9 point Hedonic scale as given by Nelson and Trout (1964). For standard plate count and yeast and moulds count method prescribed by IS: 1479 (Part III) (1962) was followed. Total coli form count was expressed as the number of organism or colony forming units per gram (cfu/g) of ice cream sample as per IS:2802-1964. The data obtained in respect to sensory evaluation and microbial quality during storage was statistically analyzed by Completely Randomized Design (CRD) described by Amale (1980).

## OBSERVATIONS AND ASSESSMENT

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

### Effect on score for overall acceptability of herbal softy ice cream :

Data is obtained as treatment wise and with in treatment during storage scores obtained on 9 point hedonic scale for sensory evaluation in respect to overall acceptability of ice cream prepared by blending 4 per cent Ginger juice and different levels of Turmeric powder were tabulated in Table 1.

Data revealed from Table 1 that, on the day of ice cream preparation (0 day) the mean overall acceptability score were recorded as 8.25, 8.29, 8.68, 8.20 and 7.28 for ice cream prepared under treatments T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub>, respectively. The highest score was obtained by treatment T<sub>3</sub> *i.e.* 0.4 per cent level of turmeric powder and then decreased simultaneously for T<sub>3</sub> while the lowest score was recorded by treatment T<sub>5</sub>. The highest scores were recorded on the day of preparation of herbal softy ice cream.

On the 5<sup>th</sup> day of storage mean overall acceptability score of were recorded as 7.95, 7.99, 8.38, 7.90 and 6.98,

on the 10<sup>th</sup> day as 7.75, 7.79, 8.18, 7.70 and 6.78, on the 15<sup>th</sup> day as 7.35, 7.39, 7.78, 7.30 and 6.38, on the 20<sup>th</sup> day as 6.85, 6.89, 7.28, 6.80 and 5.88 and On the 25<sup>th</sup> day of storage the mean score of overall acceptability were recorded as 6.35, 6.39, 6.78, 6.30 and 5.38 for ice cream prepared under treatments T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub>, respectively. On the 30<sup>th</sup> day of storage control as well as prepared by blending 4 per cent Ginger juice and different levels of Turmeric powder was rejected on the basis of overall acceptability by panel of judges.

From these observations it was determined that during storage the score for overall acceptability were decreased day by day and ice cream was acceptable up to 25<sup>th</sup> day of preparation on the basis of overall acceptability.

The results obtained in this study were in agreement with the results reported by Abdullah *et al.* (2003) who observed that the score for overall acceptability decreased steadily from initial score. Karkhele (2003) and Suneeta Pinto *et al.* (2006) reported overall acceptability score in ice cream prepared with 4 per cent ginger juice was higher than rest of treatments. These observation supports

the present trend of results. Dere (2012) observed 0.6 per cent Turmeric level best for overall acceptability of Ice-cream.

#### Microbial changes occurred in herbal softy ice cream during storage :

The ice cream sample of treatments stored at deep refrigeration temperature showed variation in microbial qualities *viz.*, standard plate count, yeast and mould count and coli form count. Observations recorded in respect to microbial quality of herbal softy ice cream prepared by blending 4 per cent Ginger juice and different levels of Turmeric powder were tabulated were statistically analyzed, tabulated, presented and discussed in the following paragraphs.

#### Effect on standard plate count of herbal softy ice cream during storage :

Observations recorded in respect to standard plate count during storage were tabulated and presented in Table 2.

Data revealed from Table 2 that, on the day of ice

**Table 1 : Effect of incorporation of 4 per cent Ginger juice and different levels of Turmeric powder on overall acceptability of ice cream (Max. score 9) during storage (-18 ± 1°C)**

Treatments	Scores recorded during storage on 9 point hedonic scale (at day) Mean of 4 replications						
	0	5	10	15	20	25	30
T <sub>1</sub>	8.25	7.95	7.75	7.35	6.85	6.35	5.85
T <sub>2</sub>	8.29	7.99	7.79	7.39	6.89	6.39	5.89
T <sub>3</sub>	8.68	8.38	8.18	7.78	7.28	6.78	6.28
T <sub>4</sub>	8.20	7.90	7.70	7.30	6.80	6.30	5.80
T <sub>5</sub>	7.28	6.98	6.78	6.38	5.88	5.38	4.88
'F' test	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
S.E. ±	0.02	0.02	0.02	0.02	0.02	0.02	0.02
C.D. (P=0.05)	0.06	0.05	0.05	0.06	0.06	0.06	0.06

**Table 2 : Effect of incorporation of 4 per cent Ginger juice and different levels of Turmeric powder on standard plate count of ice cream during storage (-18 ± 1°C)**

Treatments	Observations recorded during storage (at day) (x 10 <sup>3</sup> cfu/g) Mean of 4 replications						
	0	5	10	15	20	25	30
T <sub>1</sub>	5.10	5.98	7.83	9.95	12.63	13.45	14.52
T <sub>2</sub>	4.30	4.62	6.33	7.13	7.89	8.50	9.88
T <sub>3</sub>	4.13	4.31	5.08	6.45	7.81	8.23	8.92
T <sub>4</sub>	3.98	4.12	4.78	5.22	6.13	7.43	7.85
T <sub>5</sub>	3.82	4.05	4.63	5.18	5.95	6.32	6.78
'F' test	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.	Sig.
S.E. ±	0.02	0.03	0.02	0.02	0.03	0.03	0.03
C.D. (P=0.05)	0.07	0.09	0.06	0.06	0.08	0.09	0.09

cream preparation (0 day) standard plate count was highest, it was decreased with increase in rate if addition of different levels of Turmeric powder in 4 per cent Ginger juice blended softy ice cream. It was observed that turmeric powder control the growth of micro-organism. *i.e.* 5.10, 4.30, 4.13, 3.98 and 3.82 ( $\times 10^3$  cfu/g) for ice cream prepared under treatments T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub>, respectively. The standard plate count was gradually decreased from treatment T<sub>1</sub> to T<sub>5</sub>. The highest number of colonies was found in treatment T<sub>1</sub>.

On the 5<sup>th</sup> day of storage mean standard plate count was recorded as 5.98, 4.62, 4.31, 4.12 and 4.05 ( $\times 10^3$  cfu/g), On the 10<sup>th</sup> day as 7.83, 6.33, 5.08, 4.78 and 4.63 ( $\times 10^3$  cfu/g), On the 15<sup>th</sup> day as 9.95, 7.13, 6.45, 5.22 and 5.18 ( $\times 10^3$  cfu/g), On the 20<sup>th</sup> day as 12.63, 7.89, 7.81, 6.13 and 5.95 ( $\times 10^3$  cfu/g) and on the 25<sup>th</sup> day of storage mean standard plate count was recorded as 13.45, 8.50, 8.23, 7.43 and 6.32 ( $\times 10^3$  cfu/g) for ice cream prepared under treatments T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub>, respectively. The standard plate count was also increased during storage as compared to 20<sup>th</sup> day of preparation of

ice cream control as well as prepared by blending 4 per cent Ginger juice and different levels of Turmeric powder. On the 30<sup>th</sup> day of storage mean standard plate count was recorded as 14.52, 9.88, 8.92, 7.85 and 6.78 ( $\times 10^3$  cfu/g) for ice cream prepared under treatments T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub>, respectively.

From these observations it was determined that during storage the standard plate count was increased day by day. But during processing and storage hygienic conditions were maintained properly. Hence, score was found in normal range. Karwasra and Kapoor (2000) observed that average percentage of the samples which ISI standards for standard plate count were 6.25 which quality of market samples of ice cream sold in Hisar city. Manoharan and Ramasamy (2013) reported that increased level of inclusion of (herbal). Aloe vera ice cream with natural colour beetroot for strawberry flavour in different artificial sweetners reduced the standard plate count which supports the present results. David (2014) also observed that standard plate count was significantly decreases due to increase in rate of addition of ginger

**Table 3 : Effect of incorporation of 4 per cent Ginger juice and different levels of Turmeric powder on yeast and mould count of ice cream during storage (-18 ± 1°C)**

Treatments	Observations recorded during storage (at day) Mean of 4 replications ( $\times 10^2$ cfu/g )						
	0	5	10	15	20	25	30
T <sub>1</sub>	0.00	0.00	0.00	0.50	1.00	1.50	2.00
T <sub>2</sub>	0.00	0.00	0.00	0.00	1.00	1.25	1.50
T <sub>3</sub>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T <sub>4</sub>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T <sub>5</sub>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
'F' test	NS	NS	NS	Sig.	Sig.	Sig.	Sig.
S.E.±	0.00	0.00	0.00	0.003	0.004	0.005	0.006
C.D. (P=0.05)	0.00	0.00	0.00	0.009	0.012	0.012	0.019

NS=Non-significant

**Table 4 : Effect of incorporation of 4 per cent Ginger juice and different levels of Turmeric powder on coli form count of ice cream during storage (-18 ± 1°C)**

Treatments	Observations recorded during storage (at day) Mean of 4 replications ( $\times 10^2$ cfu/g )						
	0	5	10	15	20	25	30
T <sub>1</sub>	0.00	0.00	0.00	1.00	1.75	3.80	4.75
T <sub>2</sub>	0.00	0.00	0.00	0.50	1.50	2.50	4.50
T <sub>3</sub>	0.00	0.00	0.00	0.00	0.00	1.00	2.00
T <sub>4</sub>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T <sub>5</sub>	0.00	0.00	0.00	0.00	0.00	0.00	0.00
'F' test	NS	NS	NS	Sig.	Sig.	Sig.	Sig.
S.E.±	0.00	0.00	0.00	0.004	0.01	0.02	0.02
C.D. (P=0.05)	0.00	0.00	0.00	0.012	0.02	0.07	0.06

NS=Non-significant

juice.

### Effect on yeast and mould count of herbal softy ice cream during storage :

Observations recorded in respect to yeast and mould count during storage were tabulated and presented in Table 3.

Data revealed from Table 3 that, on the day of ice cream preparation (0, 5, 10 days) was all the treatments did not have any yeast and mould count in rate if addition of different levels of Turmeric powder in 4 per cent Ginger juice blended softy ice cream. It was observed that turmeric powder control the growth of micro-organisms.

On the 15<sup>th</sup> day of storage mean yeast and mould count was recorded as 0.50, 0.00, 0.00, 0.00 and 0.00 ( $\times 10^2$  cfu/g), On the 20<sup>th</sup> day as 1.00, 1.00, 0.00, 0.00 and 0.00 ( $\times 10^2$  cfu/g), On the 25<sup>th</sup> day as 1.50, 1.25, 0.00, 0.00 and 0.00 ( $\times 10^2$  cfu/g) and On the 30<sup>th</sup> day of storage mean yeast and mould count was recorded as 2.00, 1.50, 0.00, 0.00 and 0.00 ( $\times 10^2$  cfu/g) for ice cream prepared under treatments T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub>, respectively. As per PFA(1976), standard counts for yeast and mould were within range except control and T<sub>2</sub>, These differences may be due to hygienic condition as well as levels of turmeric powder and ginger juice incorporated in ice cream. Doraisamy (2009) reported that, the mean yeast and mould count were  $0.65 \times 10^2 \pm 0.26$ ,  $1.56 \times 10^3 \pm 0.48$  and  $41.66 \times 10^3 \pm 8.33$  which obtained microbial quality of ice cream sold in retail markets of Salem in South India .

### Effect on coli form count of herbal softy ice cream during storage :

Observations recorded in respect to coli form count during storage were tabulated and presented in Table 4.

Data revealed from Table 4 that, on the day of ice cream preparation (0, 5, 10 days) was all the treatments did not has any coliform count in rate if addition of different levels of Turmeric powder in 4 per cent Ginger juice blended softy ice cream. It was observed that turmeric powder control the growth of micro-organisms.

On the 15<sup>th</sup> day of storage mean coliform count was recorded as 1.00, 0.50, 0.00, 0.00 and 0.00 ( $\times 10^2$  cfu/g), On the 20<sup>th</sup> as 1.75, 1.50, 0.00, 0.00 and 0.00 ( $\times 10^2$  cfu/g), on the 25<sup>th</sup> day as 3.80, 2.50, 1.00, 0.00 and 0.00 ( $\times 10^2$  cfu/g) and on the 30<sup>th</sup> day of storage mean coliform

count was recorded as 4.75, 4.50, 2.00, 0.00 and 0.00 ( $\times 10^2$  cfu/g) for ice cream prepared under treatments T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub> and T<sub>5</sub>, respectively. From these observations it was determined that during storage the coliform count were increased day by day. But during processing and storage hygienic conditions were maintained properly. Hence, score was found in normal range. In treatment T<sub>1</sub> and T<sub>2</sub> counts were found, this may be due to mishandling during investigation.

David (2014) observed coli form count of herbal ice cream by addition of Ginger juice. All samples did not has any coli form. Karwasra and Kapoor (2000) observed that average percentage of the samples which ISI standards for coli form count were 59.37 which quality of market samples of ice cream sold in Hisar city.

### Conclusion :

The data obtained from present investigation indicates that on the basis of sensory evaluation herbal softy ice cream prepared from blending of 4 per cent Ginger juice and 0.4 per cent Turmeric powder (T<sub>3</sub>) was found superior and accepted extremely by the panel of judges. During storage sensory evaluation of herbal softy ice cream prepared from blending of 4 per cent Ginger juice and different levels of Turmeric powder, it was found that ice cream is accepted only up to 25<sup>th</sup> day of storage under deep freeze condition ( $-18 \pm 1^\circ\text{C}$ ). Then after on the basis of flavour, taste and overall acceptability it was rejected by the panel of judges, in all 4 per cent Ginger juice and 0.4 per cent Turmeric powder blending was found superior. It was further recorded that the standard plate count, yeast and mould count and coliform count was increased during storage. But softy ice cream prepared from 4 per cent Ginger juice and 0.4 per cent Turmeric powder blending was found superior for microbial quality, might be due to antibacterial values of turmeric powder.

### LITERATURE CITED

- Abdullah, M., Saleem-ur-Rehman, Zubair, H., Saeed, H.M., Kousar, S. and Shahid, M. (2003). Effect of skim milk in soymilk blend on the quality of ice cream. *Pakistan J. Nutr.*, 2(5) : 305-311.
- Amale, J.R. (1980). Study on soft serve ice cream blended with orange Juice. M.Sc. Thesis, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, M.S. (INDIA).

- Aman (1969).** *Turmeric, Medicinal secretes of your food.* Published by Secretary, Indo -American Hospital, NR Mohalla, Mysore India. pp 605.
- Bhandari, Vivek (2001).** *Ice cream Manufacture and Technology, 2001.* Tata McGraw Hill Publishing Company Ltd. pp. 2,61,111 115, 192-194, 220, 239.
- Chennegowda, H. (2002).** Liquid milk marketing opportunities and treats. *Indian Dairyman*, **54**(2) : 99-102.
- David (2014).** Development of herbal ice-cream by addition of ginger juice. *Trends Biosciences*, **7**(23) : 3855-3857.
- De, S. and Ray, H. (1982).** Cited from requirements of dairy processing methods. 5<sup>th</sup> Short Course, NDRI, Karnal, pp 23-24.
- Dere, V.D. (2012).** Effect of different levels of Turmeric on the quality of Ice-cream. M.Sc. (Ag.) Thesis. Dr. Panjabrao Deshmukh Krishi Vidhyapeeth, Akola, M.S. (INDIA).
- Doraisamy, K.A. and Elango, A. (2008).** Microbial Quality Of Ice Cream Sold In Retail. Markets of Salem in South India. *Egyptian J. Dairy Sci.*, **37** : 113-116.
- IS-1479, Part II, 1961. Methods of test for dairy industry. Indian Standard Institute, Manak Bhavan, New Delhi.
- IS-1981. *Hand book of food Analysis*, SP- 18 Part XI (Dairy Product) Bureau of Indian Standard Manak Bhavan 9, Bahadur Shah Zafar Marg, New Delhi (INDIA).
- IS-2802-1964. Bureau of Indian Standard Manak Bhavan 9, Bahadur Shah Zafar Marg, New Delhi (INDIA).
- Karkhele, P.D. (2003).** Studies of some freezing and thermal properties of ginger ice Cream. M.Tech. Thesis , IGKV. Raipur, C.G. (INDIA).
- Karwasra, R.K., Srivastava and Kapoor, C.M. (2000).** Quality of market samples of ice cream sold in Hisar city. *J. Dairying, Foods & Home Sci.*, **19**(1) : 50-53.
- Manoharan, A.P. and Ramasamy, D. (2013).** Physico-chemical, microbial and sensory analysis of Aloe vera (pulp) ice cream with natural identical vanilla flavour in different artificial sweeteners. *Indian J. Fundamental & Appl. Life Sci.*, **3**(2) : 106-113.
- Nelson, J.A. and Trout, G.M. (1964).** *Judging dairy product.* 4<sup>th</sup> Edn. IVEA, Olsen Pub. Co. , Wilwauke, pp 357.
- PFA (1976). Prevention of Food Adulteration Rules, 1955 (As amended upto Aug. 9, 1995) Dairy India, 1987.
- Sharif, N., Ghanghesh, K.S., Gnan, Y.A.S. and Rahouma, A. (2005).** Bacteriological quality of ice cream in Tripoli-Libya. *Food Cont.*, **17** : 637- 641.
- Singh, P.K., Singh, J. and Pandey, R.K. (2003).** Consumer acceptance of Soft serve ice cream. Nutritional seminar on value added dairy products Dec. 18 (2005).
- Suneeta Pinto, Rathour, A.K., Jana, A.H., Prajapati, J.P. and Solanky, M.J. (2006).** Ginger shreds as flavouring in ice cream at Anand Agriculture University, Anand (Guj.). *Natural Product Radiance*, **5**(1) : 15-18.

Received : 14.10.2015; Revised: 05.02.2016; Accepted : 19.02.2016