The Pharma Innovation Journal 2022; SP-11(11): 1708-1710

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277-7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; SP-11(11): 1708-1710

www.thepharmajournal.com
Received: 13-09-2022
Accepted: 16-10-2022

PS Markam
College of Agriculture & Research Station, IGKV, Raipur, Chhattisgarh, India

Deo Shankar
College of Agriculture & Research Station, IGKV, Raipur, Chhattisgarh, India

Pradeep Kumar Ganjeer
College of Agriculture & Research Station, IGKV, Raipur, Chhattisgarh, India

Homendra Siwana
College of Agriculture & Research Station, IGKV, Raipur, Chhattisgarh, India

Anshumala Kujur
College of Agriculture & Research Station, IGKV, Raipur, Chhattisgarh, India

Corresponding Author:
PS Markam
College of Agriculture & Research Station, IGKV, Raipur, Chhattisgarh, India

Study on standardization of recipe for custard apple ice-cream

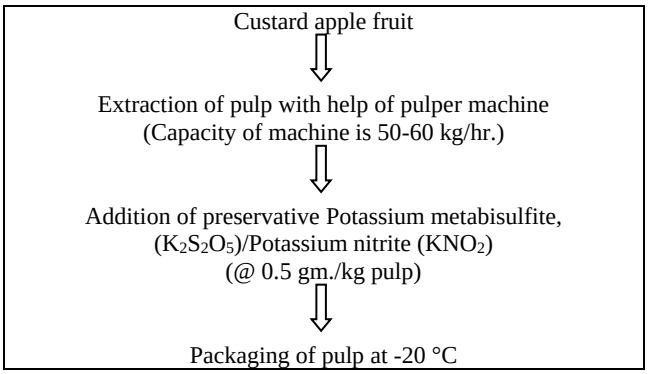
PS Markam, Deo Shankar, Pradeep Kumar Ganjeer, Homendra Siwana and Anshumala Kujur

Abstract
An experiment was conducted at College of Agriculture & Research Station, Singarbhat, Kanker (Chhattisgarh) during the year 2022 to study sensory properties of custard apple pulp ice cream. The experiment was designed in Completely Randomized Design (CRD) with three replications. Ice cream was analyzed for sensory attributes like flavour, texture, taste and overall acceptability. The result clearly indicated that the mean score was recorded to T_3 (8.65) for overall acceptability. In organoleptic evaluation, the highest score of flavour (7.60), texture (8.47), taste (8.22) and overall acceptability (8.65) were recorded in the ice cream with T_3 (100% Pulp + 50% Whipping cream + 20% Condensed milk + 5% Sugar + 5% Milk powder). On the basis of result it was concluded that T_3 was best for the preparation of custard apple ice-cream. In economic analysis of ice-cream the maximum net profit was obtained in T_1 (Rs. 278.8). Similarly Benefit–cost ratio was found highest in T_1 (1.534).

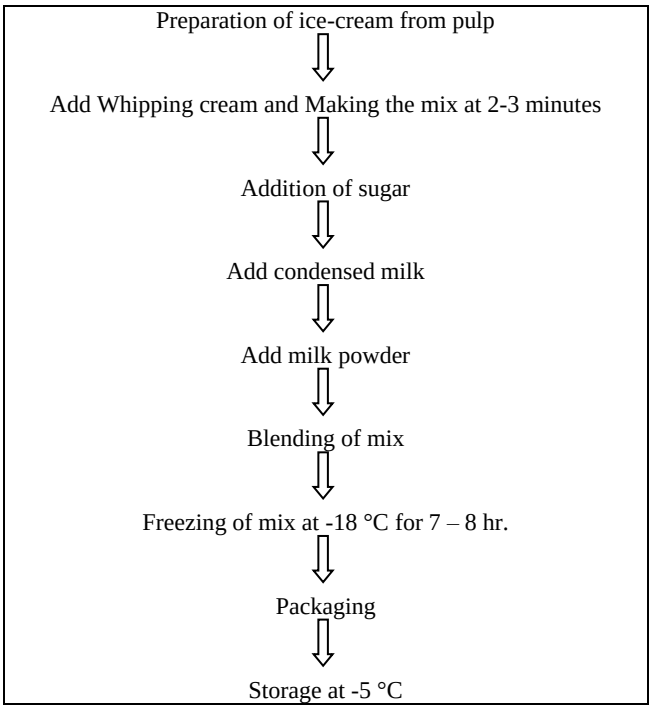
Keywords: Custard apple, ice-cream, sensory evaluation, benefit-cost ratio

Introduction
Custard Apple (*Anona squamosa* L.) is a well-known fruit for its nutritional composition as well as for its medicinal properties. This fruit is commonly known as custard apple, sugar apple, sweet soup, sour soup (Bakane *et al*., 2016) [2]. It is native to Tropical America. Of the 40 genera of the Annonaceae family, genus *Annona* has 120 species, 6 of them having pomological significance. In India, custard apple is grown in Maharashtra, Gujarat, Andhra Pradesh, Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Bihar, Assam, Rajasthan, Orissa and Tamil Nadu (Markam *et al*., 2012) [10]. The pulp may be consumed raw or transformed into various food products. The taste of pulp is aromatic sweet, with custard like flavor. It has great potential for value addition through processing (Kotecha *et al*., 2000) [8]. In India area and production of custard apple was 46 thousand ha. and 401 thousand MT, respectively in 2017-18 (Indian Horticulture Database 2018) [6]. In Chhattisgarh during 2021-22 area and production was 9.54 thousand ha. and 53.01 thousand MT, respectively (Directorate Horticulture & Farm Forestry, Chhattisgarh). Area of custard apple was maximum in Kanker district i.e. 1.54 thousand ha whereas it was third largest producer i.e. 6.44 thousand MT among all district of Chhattisgarh. Average percent of pulp, peel and seeds of custard apple fruits were 40.38%, 48.62% and 10.30% respectively (Bakane *et al.*, 2015) [1].
This fruit contains moisture (70.5%), carbohydrates (23.5%), proteins (1.6%), fat (0.4%), mineral matter (0.9%), iron (1.0%), calcium (0.2%), phosphorus (0.04%) and energy value 104 Kcal/100g of the edible portion, sugar (0.05-4.5%), fibre (0.05-4.5%), ash (0.4-0.8%), lipid (0.3-0.6%), ascorbic acid (10-300 mg), Niacin (0.8 mg), vitamin E (0.6 mg), vitamin B6 (0-0.2 mg) and vitamin A (0-6 IU) (Gopalan *et al*., 2004) [4] and (Leung and Flores, 1961; Janick and Paul, 2006) [9, 7]. The custard apple fruit is mostly used as a dessert fruit because of its delicious taste and nutritive value. The purpose of this study was to find out the taste texture flavour and overall acceptability of custard apple ice-cream.

Materials and Methods
The present investigation was carried out in the Horticulture laboratory, College of Agriculture & Research Station, Singarbhat, Kanker. Fully ripened custard apple fruits was obtain from custard apple orchard at college and used for preparation of custard apple ice-cream. Pulp of custard apple extracted by electric operated pulper machine and packing done through vacuum packing machine. Preparation procedure of custard apple pulp ice-cream given on flow chart.



Flow chart 1: Pulp extraction procedure



Flow chart 2: Preparation Procedure of custard apple ice-cream

Treatments

T_1	-	100% Pulp + 50% Whipping cream + 20% Condensed milk + 0% Sugar + 5% Milk powder
T_2	-	100% Pulp + 50% Whipping cream + 20% Condensed milk + 2.5% Sugar + 5% Milk powder
T_3	-	100% Pulp + 50% Whipping cream + 20% Condensed milk + 5% Sugar + 5% Milk powder
T_4	-	100% Pulp + 50% Whipping cream + 20% Condensed milk + 7.5% Sugar + 5% Milk powder
T_5	-	100% Pulp + 50% Whipping cream + 20% Condensed milk + 10% Sugar + 5% Milk powder
T_6	-	100% Pulp + 50% Whipping cream + 20% Condensed milk + 12.5% Sugar + 5% Milk powder
T_7	-	100% Pulp + 50% Whipping cream + 20% Condensed milk + 15% Sugar + 5% Milk powder
T_8	-	100% Pulp + 50% Whipping cream + 20% Condensed milk + 17.5% Sugar + 5% Milk powder
T_9	-	100% Pulp + 50% Whipping cream + 20% Condensed milk + 20% Sugar + 5% Milk powder
T_{10}	-	100% Pulp + 50% Whipping cream + 20% Condensed milk + 22.5% Sugar + 5% Milk powder

Sensory evaluation of ice-cream: The custard apple ice-cream were evaluated in three replication by a panel of 15 judges consisting staff of college using an hedonic scale in accordance with the method described by Gupta (1976) [5].

Statistical analysis of data: The experiment was laid out in completely randomized design (CRD) with 10 treatment and three replications and experimental data was analyzed using the method of Panse and Sukhatme (1967) [11]. In all three replications were taken.

Result and Discussion

Organoleptic score of custard apple ice-cream

The organoleptic score of custard apple ice-cream was recorded at just after preparation for different parameters like flavour, sweetness, texture, and overall acceptability in horticulture laboratory. Keeping these various attributes of Custard Apple Ice-Cream, the results are presented in Table 2.

Flavour: It was Observed that average flavour score was highest in T_3 (7.6) for custard apple ice-cream followed by T_1 (6.5) rated equally in between like Slight to moderately. T_2 (6.33) and T_4 (6.30) rated equally in between neither liked nor disliked to liked slightly.

Texture: It was recorded from result that the texture of ice-cream ranged from 5.47 (T_{10}) to 8.47 (T_3). The highest score was found in T_3 (8.47) followed by T_1 (7.47) and both were rated in between liked moderately to liked very much. The result indicates that medium proportion of sugar in comparison to custard apple pulp was found better in improving the texture of custard apple ice-cream.

Overall accessibility: The mean score for overall acceptability was found to be maximum for treatment T_3 (8.65) followed by T_2 (8.41) and T_1 (8.11) and minimum score was observed in T_{10} (6.31). The treatment T_3 (100% Pulp + 50% Whipping cream + 20% Condensed milk + 5% Sugar + 5% Milk Powder) was most accepted by judges then the other treatment combination.

Table 2: Sensory evaluation of custard apple ice-cream

Treatment	Flavour	Texture	Taste	Overall Acceptability
T_1	6.57	7.47	8.06	8.11
T_2	6.33	6.97	7.97	8.41
T_3	7.60	8.47	8.22	8.65
T_4	6.30	6.90	6.96	7.66
T_5	5.83	6.03	6.86	7.65
T_6	6.20	6.75	6.53	7.55
T_7	4.70	6.20	6.50	7.14
T_8	5.00	5.50	6.22	7.35
T_9	4.00	5.60	5.43	6.71
T_{10}	3.90	5.47	4.57	6.31
C.D.	1.21	1.211	1.146	1.107
SE(m)	0.407	0.408	0.386	0.373
SE(d)	0.576	0.576	0.545	0.527
C.V.	12.505	10.804	10.021	8.547

Production Economics of Custard Apple Ice-cream

Production economics of custard apple ice-cream is presented in table 3. The total expenditure was highest in T_{10} (Rs.530.2/ kg.) and lowest in T_1 (Rs. 521.2 /kg.). The gross returns were same in all treatment i.e. Rs. 800 /Kg. The maximum net profit was obtain in T_1 (Rs. 278.8 /kg) followed by T_2 (Rs.277.8 /kg) and T_3 (Rs.276.8/ kg.) respectively. Benefit-cost ratio was highest in T_1 (1.534) and lowest in T_{10} (1.511). The cost benefit shows that there was less difference among all the treatments. This is due to raw material is available locally.

Table 3: Production Economics of Custard Apple Ice-cream

Treatments	Total Expenditure (Rs. /Kg)	Gross Returns (Rs. /kg)	Net Profit (Rs. /kg)	B:C Ratio
T_1	521.2	800	278.8	1.534
T_2	522.2	800	277.8	1.531
T_3	523.2	800	276.8	1.531
T_4	524.2	800	275.8	1.529
T_5	525.2	800	274.8	1.526
T_6	526.2	800	273.8	1.523
T_7	527.2	800	272.8	1.520
T_8	528.2	800	271.8	1.517
T_9	529.2	800	270.8	1.514
T_{10}	530.2	800	269.8	1.511

Conclusion

The study concluded that based on the sensory parameter evaluation custard apple ice-cream with T_3 (100% Pulp + 50% Whipping cream + 20% Condensed milk + 5% Sugar + 5% Milk powder) resulted in most acceptable ice-cream and rank between liked moderately (LM) to liked very much (LVM). In economics analysis of custard apple the highest benefit and cost ratio was found in T_1 (1.534) and lowest was found in T_{10} (1.511). The total expenditure was found highest in T_{10} (Rs. 530.2 /Kg.). The gross returns estimated per kg basis were same in all treatment i.e. Rs.800/ kg. The maximum net profit was obtained in T_1 (Rs. 278.8 /Kg.). Similarly benefit-cost ratio was found highest in T_1 (1.534). Overall cost benefit was found well in all treatment, this was due to raw material is available locally.

References

1. Bakane PH, Borkar PA, Gajabe MH, Khakare MM. Physical properties of custard apple fruit (*Annona Squamosa* L.). International Journal of Agricultural Science and Research. 2015;5(4):343-552.
2. Bakane PH, Khakare MM, Gajabe MH, Khedkar MB. Standardization of Process for Custard Apple Milk Shake. International Journal of Environment, Agriculture and Biotechnology. 2016;1(4):708-712.
3. Directorate Horticulture and Farm Forestry, Chhattisgarh (Department of Agriculture, Government of Chhattisgarh) www.agriportal.cg.nic.in.
4. Gopalan C, Rama Sastri, Balasubramanian. Nutritive value of Indian foods, National Institute of Nutrition, Indian Council of Medical Research, Hyderabad; c1978.
5. Gupta SA. Sensory evaluation of food. Indian Dairyman. 1976;28(7):293-295.
6. Indian Horticulture Database, 2018. http://nhb.gov.in.
7. Janick J, Paul RE. The Encyclopaedia of Fruit and Nuts. Cambridge University Press, Cambridge; c2006. p. 954.
8. Kotecha PM, Adsule RN, Kadam SS. Processing of custard apple: Preparation of ready to serve beverage and wine, India Food Packer. 2000;49(5):5-10.
9. Leung WT, Flores M. Food composition. Tables for use in Latin America, National Institute of Health, Bethesda, Md.; c1961.
10. Markam R, Singh V. Studies on microbial and sensory quality of custard apple RTS beverage. The Asian Journal of Horticulture. 2012;7(2):460-464.
11. Panse VG, Sukhatme PV. Statistical Methods for Agriculture Workers. (4th Edition) ICAR, New Delhi; c1967.