

Development of Probiotic Pineapple Ice cream and Smoothie

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ABSTRACT

Ice cream is a frozen dairy product made by suitable blending and processing of cream and other milk product, together with sugar and flavour, with or without stabilizer or colour, and with incorporation of air during freezing process. Probiotics are the microorganisms that have claimed to have health benefits when consumed in specific amount. Kefir is a natural probiotic. It has frequently claimed to be against variety of disease. The aim of the work was to obtain ice cream which contains Probiotic i.e. viable microorganisms, using Kefir as a source of probiotic bacteria. As kefir ice cream developed was not accepted because of the use of fermented milk, so the present study was conducted to enhance the sensory acceptability and to determine the nutritional content of ice cream. The probiotic kefir ice cream was evaluated organoleptically using hedonic scale method. It provides 10.15 g of protein, 23.95 g of carbohydrates, 8.8 mg of Vitamin C and 27 mg of calcium

Keywords: - Ice cream, Probiotic, Kefir, Organoleptic response, Dairy product, Pineapple

INTRODUCTION

Ice cream is a frozen dairy product made from cream or butter fat milk, sugar and flavouring agents. Ice cream is frequently considered as a “fun food”, which was undeserving consideration and even was considered as a “junk food”. Ice cream is relatively well balanced, wholesome, easily digestible and delicious food. It is because ice cream is a nutritious element of diet that is frequently used as meal component for hospital patient. Probiotics can be defined as live microorganisms (Bacteria or Yeast) that can bring health benefits to humans or animals, usually the maintenance and/or improvement of the intestinal environment. Several generic health advantages are attributed to probiotics, including anti-mutagenic and anti-carcinogenic effect, immune system stimulation (immune modulation), anti-infection properties, Serum Cholesterol reduction and nutritional enhancement. Various studies have shown that probiotic cultures can better maintain their stability at appropriate level in frozen food product. Kefir is a product of fermentation of milk with kefir grain and mother culture is prepared from grain. It contains complex mixture of both bacteria (including species of *Lactobacilli*, *Lactococci*, *Leuconostocs*, *Acetobacter*) and Yeast (both Lactose fermenting and Non-Lactose fermenting). Kefir contain Vitamin, Minerals and essential amino acid that helps the body with healing and also contain easily digestible complete protein. Regular kefir consumption can help to relieve all intestinal disorders, promote bowel movement Reduce flatulence and create a healthier digestive system. High nutritional values and health benefits of kefir are numerous; therefore, it is recommended to consumed by premature infants, young children, pregnant and nursing women, patients and old people. Pineapple (*Ananas comosus*, Bromeliaceae) is a wonderful tropical fruit having exceptional juiciness, vibrant tropical flavour and immense health benefits. Pineapple contains considerable calcium, potassium, fibres, and vitamin C. It is low in fat and cholesterol. Vitamin C is the body's primary water-soluble antioxidant, against free radicals that attack and damage normal cells. It is also a good source of vitamin B1, vitamin B6, copper and dietary fibre. It is a digestive aid and a natural Anti-Inflammatory fruit

Stabilizers are used to prevent the formation of objectionable large ice crystal in ice cream. They have water holding capacity, in addition they prevent ice crystal formation during storage, give uniformity of product, give desired resistance to melting and improve handling properties. In this product development CMC (E-466) is used in 0.1-0.2% as it provides chewiness and imparts body to ice cream, Xanthan Gum (E-415) a bacterial exopolysaccharide obtained by the growth of *Xanthomonas campestris* in culture. Its blend with guar gum or locust bean gum which makes an effective stabilizer for ice cream, ice milk, sherbet and water ice. Guar gum (E-412) is extracted from the seeds of a tropical legumes, *Cyamopsis tetragonoloba*, called Guar. It effectively decreases the undesirable effect of heat shock in ice cream it readily disperses and did not cause excessive viscosity in the mix.

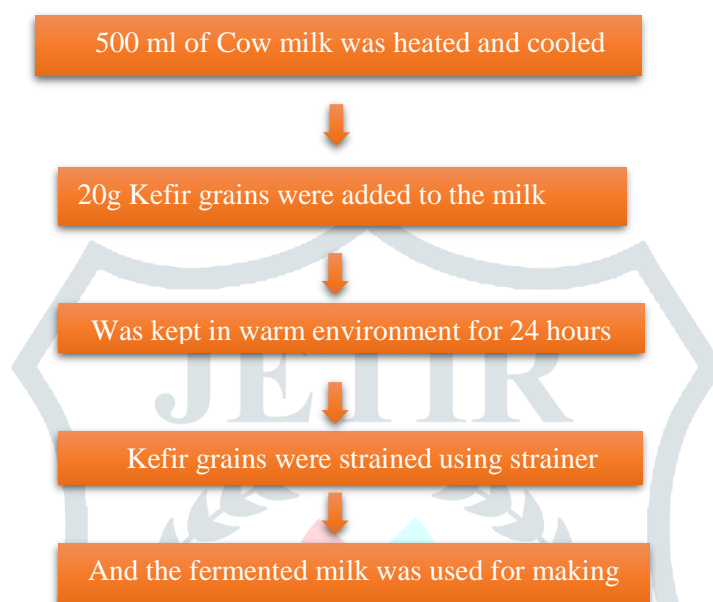
MATERIAL

- 1) Whole cow milk/ buffalo milk
- 2) GMS (Glycerol Monostearate) powder
- 3) CMC (Carboxy Methyl Cellulose) powder
- 4) Sugar
- 5) Fresh cream

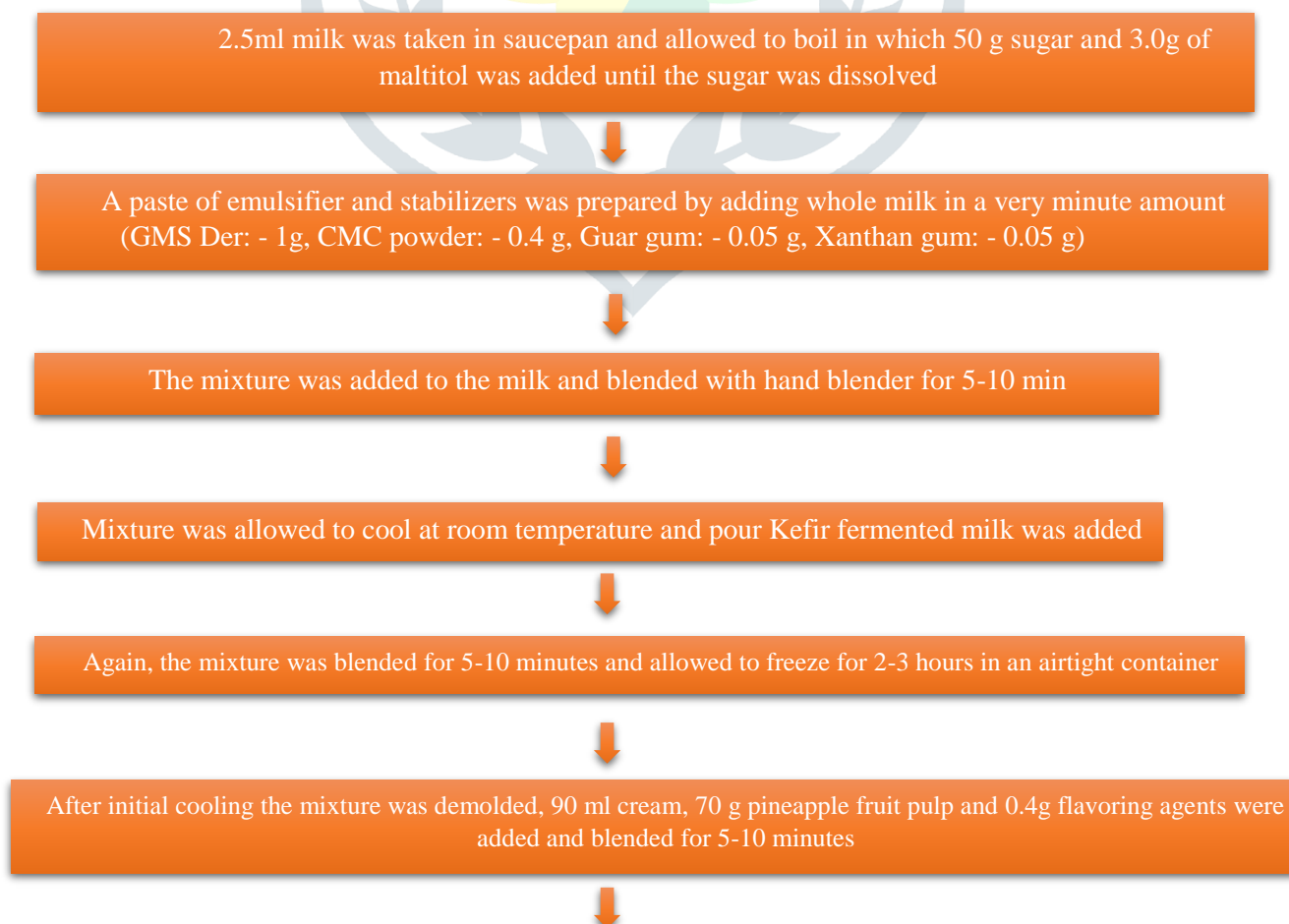
- 6) Kefir fermented milk
- 7) Guar gum
- 8) Xanthan gum
- 9) Maltitol
- 10) Pineapple Flavor powder
- 11) Pineapple pulp

METHOD OF PREPARATION

A) Kefir milk: -



B) Ice Cream: -



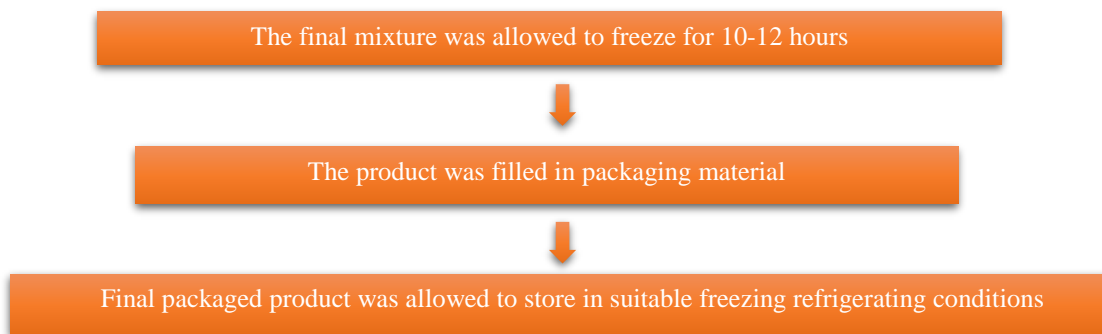


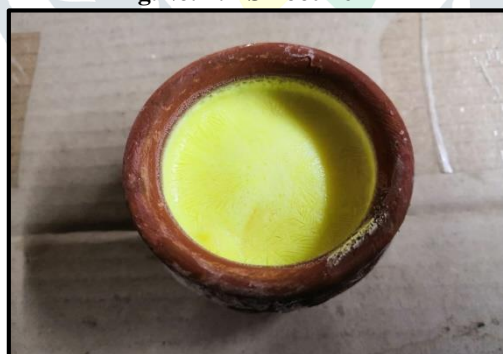
Fig.No. 1: - Ice cream



C) Smoothie: -

For smoothie, Same procedure was followed only refrigeration was allowed for 1-2 hours

Fig.No. 2: - Smoothie



NUTRITIONAL CONTENT

As per new norms of FDA and FSSAI, it is mandatory to have nutritional value analysis displayed on food container. Hence same was carried out for Ice cream. The result for 100 gm sample is as follows

Table No.1: - Nutritional content

Sr.no	Nutrients	Values
1	Moisture	64.08%
2	Ash	1.84%
3	Total fat	22.27%
4	Protein	10.15 g
5	Carbohydrate	23.95 g
6	Vitamin C	8.8 mg
7	Calcium	27 mg

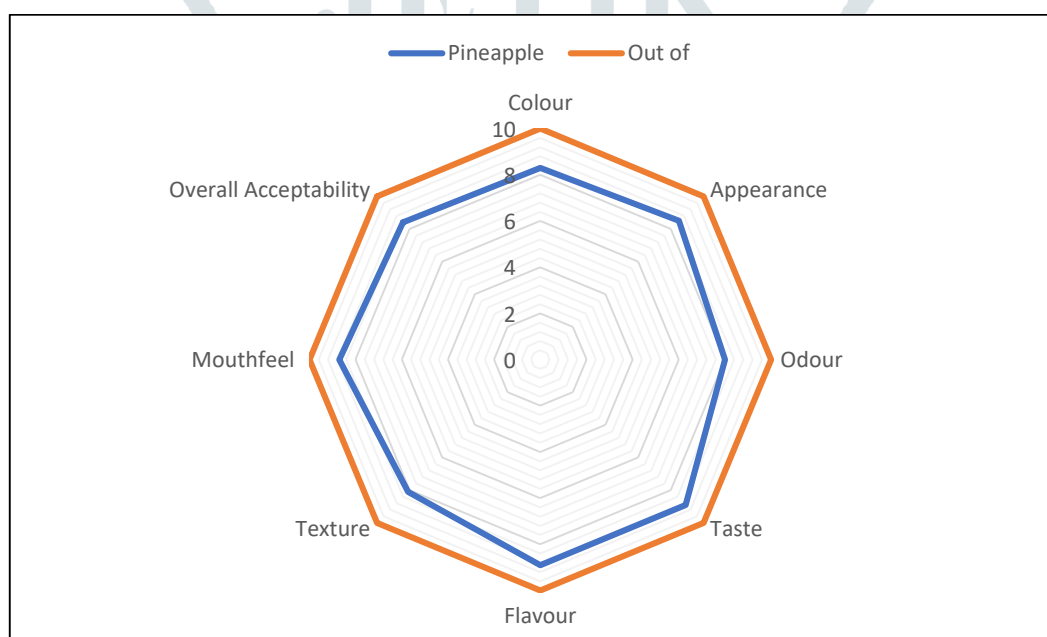
SENSORY EVALUATION

The sensory evaluation of different organoleptic characteristics i.e., colour, appearance, taste, texture, flavour, mouthfeel, and overall acceptability were carried out by semi trained panellists by method of hedonic scale with “10 as Like Extremely and 1 as Dislike extremely”. The average score was calculated for individual organoleptic properties. Sensory evaluation is carried out by 20 evaluators for various quality attributes on following scale

Table No.2: - Observation Table For SAB

Attribute	Rating Score
Color	8.3
Odour	8.5
Appearance	8.0
Taste	8.9
Flavor	8.9
Texture	8.1
Mouthfeel	8.7
Overall Acceptability	8.41

Fig.No. 3: - Radar chart for Ice cream and Smothiee



SHELF LIFE STUDIES

The shelf life study was started from the second day of making of the product. Ice cream was stored under refrigerated condition for 4 weeks in its packaging material. The product was observed at frequent intervals for any change in appropriate color, odour, texture, taste and moisture. The observations are as follows:

Table No.3: - Observation and Result of shelf life studies

Day	Observation
Week 1	No change in color, odour, texture and taste
Week 2	No change in color, odour, texture and taste
Week 3	No change in color, odour, texture and taste
Week 4	No change in color, odour, texture and taste

Result: - The shelf life of Ice Cream can last up to 3weeks while storing in refrigerator.

EVALUATION OF MICROBIAL ANALYSIS

Determination of bacteria and moulds helps in the analysis of sample quality after the production, harvesting, manufacturing and storage practices. This is done by using Total Plate Count method, here Nutrient agar is used to enumerate bacteria, whereas Sabouraud's agar is used to enumerate fungus and moulds

Table No.4: - Observation Table For NA

Days	Dilution Used	Colony Count (cfu/ml)
Day 3	10^{-3}	1
	10^{-4}	3
	10^{-5}	0
Day 5	10^{-3}	0
	10^{-4}	0
	10^{-5}	0
Day 7	10^{-3}	0
	10^{-4}	1
	10^{-5}	2

Table No.5: - Observation Table For SAB

Days	Dilution Used	Colony Count (cfu/ml)
Day 3	10^{-3}	0
	10^{-4}	0
	10^{-5}	1
Day 5	10^{-3}	1
	10^{-4}	0
	10^{-5}	0
Day 7	10^{-3}	0
	10^{-4}	0
	10^{-5}	1

CONCLUSION

The nutritional product Probiotic Ice Cream was prepared by adding certain food additives and Its proximate analysis and organoleptic response was carried out in which the product showed great acceptance from panellists and also shelf life studies predicted that it can be stored for 30 days under certain prescribed conditions

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