

The Complete Technology Book on Flavoured Ice Cream (2nd Revised Edition)- Manufacturing Process, Flavours, Formulations with Machinery Details

Author:- NPCS Board of Consultants & Engineers

Format: paperback

Code: NI184

Pages: 448

Price: Rs.1475US\$ 39.86

Publisher: NIIR PROJECT CONSULTANCY SERVICES

Usually ships within **5** days

Ice cream is a frozen-food, sweet in flavor and is consumed as a dessert all over the globe. Ice-cream comes in variety of flavors in which fruits, nuts and other ingredients can be added to enhance the nutritional value and organoleptic property of the product. It is stored in the freezing- temperature and contains mild preservatives. Ice Cream is a favourite food of millions around the world. Ice Cream is a palatable, nutritious and relatively inexpensive food. Ice Cream is composed of the mixture of food materials, such as milk products, sweetening materials, stabilizers, emulsifiers, flavours or egg products which are referred to as ingredients.

The rising demand for innovative flavors, formats and growing demand for impulsiveness to consume the product in developing countries is expected to drive the market growth. The increased demand for frozen desserts in the developed countries is supporting the sale of ice creams. The developing technologies have helped in enhancing and innovating new flavors in the ice creams which has also helped in fueling up the market share of the product. Ice Cream is among the largest supermarket food categories which is generating high revenue. The global ice cream industry is a prosperous industry and the positive growth momentum has attracted food giants to diversify and expand their product lines.

Some of the fundamentals of the book are composition of ice cream mixes, the role of the constituents, diet science and classification of ice cream, caloric content of ice cream and related products, milk fat content of ice cream, classification of ice cream and related products, artificially sweetened frozen dairy foods, ingredients of ice cream roles and properties, effect of sweetener on freezing point, influence on ice crystal size and texture, flavor, colour materials and preparation, ice cream mixer preparation, processing and mix calculations, the freezing process, the freezing point of ice cream mixes, ice cream handling, cleaning and sanitation, varieties, novelties and specials, molded cones, ice cream cone making, success story of natural ice cream, specifications of ice cream plant, process flow diagram, sample plant layout and photographs of machinery with supplier's contact details.

A total guide to manufacturing and entrepreneurial success in one of today's most lucrative food industries. This book is one-stop guide to one of the fastest growing sectors of the food industry, where opportunities abound for manufacturers, retailers, and entrepreneurs. This is the only complete handbook on the commercial production of ice cream. It serves up a feast of how-to information, from concept to purchasing equipment.

CONTENTS

1. ICE CREAM-HISTORY AND DEVELOPMENT

Historical Background

2. COMPOSITION OF ICE CREAM MIXES

Composition

The Role of the Constituents

Milk Fat

Milk Solid Not Fat (MSNF)

Sweetener Solids

Egg Yolk Solids

Stabilizers

Emulsifiers

Total Solids

Water and Air

Flavour

Importance of flavour

Colour

Optional ingredients

The Balanced Mix

Conditions That Limit the Balancing of a Mix

Mix Properties

Mix Stability

3. DIET-SCIENCE AND CLASSIFICATION OF ICE CREAM

Nutritional Value

Energy Value and Nutrients

Energy Content of Food

Caloric content of Ice Cream and related Products

Energy Content of Ice Cream and Related Products

Protein Content of Ice Cream

Milk Fat Content of ice cream

Milk Fat Content

Carbohydrates

Carbohydrates in Ice Cream

Minerals

Minerals in Ice Cream

Vitamins

Vitamins in Ice Cream

Palatability and Digestibility of Ice Cream

Classification of Ice Cream and Related Products

Commerical Grouping of Ice-Cream and

Related Products Plain Ice Cream

Chocolate

Fruit

Nut

Frozen Custard

Confection

Bisque

Puddings

Mousse

Variegated Ice Cream

Neapolitan

Ice Milk
Fruit Sherbet
Ice
Novelties
Frappe
Granite
Souffle
Frozen Yoghurt
Lacto
Fruit Salad
Fancy Moulded Ice Cream
This group includes
Mellorine-type Products
Artificially Sweetened Frozen Dairy Foods
Non Dairy Frozen Dessert
Labelling Requirement Grouping
Regulatory Type Classification

4. INGREDIENTS OF ICE CREAM-ROLES AND PROPERTIES

Sources of Milk Solids Not Fat
Milk
Milk Products used in Ice Cream Sources of Fat
Skim Milk
Butter Milk
Concentrated Skim Milk
Sweetened Condensed Milk
Skimmed Milk Powder
Special Commercial products
Whey Protein Concentrate
Mineral Salts
Unsalted Butter
Sweeteners
Sources of Sugar
Effect of Sweetener on Freezing point
Sucrose
Corn Sweeteners and Related Ingredients
Dextrose
Corn Syrup
Dried Corn Syrup
Invert Sugar
Honey
Other Sweeteners
Nonnutritive Sweeteners
Egg and Egg Products
Fat Replacers
Sugar Alcohols
Syrups
Stabilizers and Emulsifiers
Function of Stabilizers
Influence on Ice Crystal Size and Texture
Shape and Body Characteristics
Retention of Air
Role in Fat Destabilization

Control of Sandiness
Stabilizers
Casein
Sodium Alginate
Carrageenan
Guar Gum
Locust Bean Gum
Sodium Carboxy Methyl Cellulose (CMC)
Pectin
Agar-Agar
Xanthan Gum
Hydroxypropyl Methyl Cellulose
Other Gums
Starch
Stabilizer Blends
Emulsifiers
Type of Emulsifiers
Glycerides
Distilled Monoglyceride
Polysorbates
Polyglycerol Esters
Fruit Acid Esters
Ethoxylated Mono and Diglycerides
Egg Yolk Solids
Function of Emulsifiers
Whipping Ability and Overrun Control
Stiffness and Dryness
Secondary Effect of Emulsifiers
Selection of Stabilizer and Emulsifier
Processing the Cocoa Beans

5. FLAVOURS AND COLOURS-MATERIALS AND PREPARATION 69

Flavours for Frozen Desserts
Vanilla
Imitation Vanilla Flavourings
Consistency in Vanilla Quality
Vanilla Ice Cream
Chocolate and Cocoa
Chocolate Ice Cream
Freezing Characteristics
Chocolate Confections
Fruits in Frozen Desserts
Fresh Fruit
Candied and Glaced Fruits
Dried Fruits
Procedures and Recipes
Strawberry Ice Cream
Raspberry Ice Cream
Peach Ice Cream
Cherry Ice Cream
Ice Cream with Complex Flavours
Sugar Free

Nuts
Spices and Salt
Colour in Frozen Desserts
Flavouring Lowfat and Nonfat Ice Cream

6. ICE CREAM MIXER-PREPARATION PROCESSING AND MIX CALCULATIONS 85

Preparation of the Mix
Combining the Ingredients
Pasteurization of the Mix
Pasteurization Renders the Mix
There are two basic Methods of Pasteurization
Homogenizing the Mix
Physical Effect of Homogenization
Homogenizing Temperature
Location of Homogenizer
Pressure for Homogenization
Care of the Homogenizer
Cooling the Mix
Ageing the Mix
Making the Mix in a Vacuum pan
Forewarming
Concentrating the Dairy Products
Weighing the Concentrated Dairy Products
Adding Sugar and Stabilizer, and Pasteurizing
Flavouring Mixes
Cooling, Standardizing and Ageing
Packaging Mixes for Sale
Calculation of ice Cream Mixes
The Importance of Calculations
Mathematical processes Most Frequently Used
Methods of Calculating Mixes
Pearson Square Method
Arithmetical Method
Calculating Mixes with the Serum Point Method
Mix Decisions
Simple Mixes
Complex Mixes

7. THE FREEZING PROCESS

The Freezing Point of Solutions
The Freezing Point of Ice Cream Mixes
Prefreezing Tests
Freezing Operations
Changes that take Place during the Freezing Process
Refrigeration Needed to Freeze Ice Cream
Types of Freezers
The Continuous Freezer
The Refrigeration System
Operating the Continuous Freezer
Batch Freezer
Freezing Procedure for Batch Freezers

8. ICE CREAM HANDLING

Considering the Package

Requirements for Packaging

Paper

Substance of Paper

Stiffness

Ink

Wax

Adhesive

Wax Content

Odour and Taint

Toxicity

Resistance to Deep Freezing

Leak Proofness

Paper Board

Thickness

Wax Content

Stiffness

Ink

Wax Quality

Adhesive

Odour and Taint

Manufacturer's Joint

The Packaging Operation

Packaging for Direct Sale to Consumers

Economy in Packaging Operations

The Hardening Process

Factors Affecting Hardening Time

Types of Hardening Facilities

Rapid Hardening Systems

Handling, Storing and Shipping

Shipping with Dry Ice

Quality is the Goal

9. CLEANING AND SANITATION

Principles of Cleaning

Cleaning

Rinsing

Removal of Sediment

Removal of Fat

Removal of Proteins

Removal of Mineral Deposits

After Rinsing with Clean Water

Cleaning Agents

Alkalis

Acids

Water Chelating Agent

Emulsifiers and Wetting Agents

Protective Substances

Composite Cleaning Agents

Alkaline Composites

Sanitization of Equipment

Sanitary Environment

Hygienic Personnel
Test of the Finished Product
Hazard Analysis and Critical Control Points (HACCP)
HACCP Principles
Summary

10. DEFECTS AND GRADING OF ICE CREAM

Flavour Defects
Flavouring System
Sweetener System
Body and Texture Defects
Defects of Body
Defects of Texture
Colour
Package
Melting Quality
Defects of Melting Quality
Defects in Ice Cream, their Causes and Prevention
Evaluating Frozen Desserts
Scoring Methods
Ice Cream Clinics

11. VARIETIES, NOVELTIES AND SPECIALS

Plain Ice Cream
Formula
Variations
Vanilla
Strawberry
Rose
Coffee
Caramel
Mint
Candy Ice cream
Variations
Peppermint Stick
Butter Crunch
Peanut Brittle
Toffee
Mint Chips
Mithai Ice Cream (Gulabjamun)
Mithai Ice Cream (Rasogulla)
Mithai Ice Cream (Gajar Halwa)
Chocolate Ice Cream
Chocolate Malt
Chocolate Malt and Nuts
Chocolate Toffee
Chocolate Cool
Fruit Ice Cream
Variations
Banana
Pineapple
Apple
Orange
Orange Pineapple

Lemon
Grape
Custard Apple
Date
Sapota
Mango
Strawberry
Blueberry
Raspberry
Nut Ice Cream
Variations
Butterscotch
Almond Walnut
Almond Toffee
Peanut
Caramel Nut
Fruit and Nut
Coconut Pineapple
Tutti-Frutti
Banana Nut
Variegated or Rippled Ice Cream
Probiotic Ice-Cream
Manufacture of Prebiotic Ice-Cream
Labelling of Probiotic Foods
New Diet Science for Ice Cream
Sorbet and Ice Cream
Manufacturing Procedure
Ice Cream Mix
Sorbet
Freezing
Kulfi
Product Description
Technology
Innovations
Formulation of Kulfi
Optional Dairy Ingredients for Kulfi and Frozen Desserts
Sweet Fresh Cream and Fresh Milk
Frozen Cream
Fluid Whole and Skim Milk
Plain Condensed Skim Milk
Plain Condensed Whole Milk
Sweetened Condensed Whole or Skim Milk
Packaging
Physico-Chemical Aspects
Shelf Life
Decoration

12. ICE CREAM MICROBIOLOGY

Ice Cream as a Carrier Disease
The Bacterial Count of Ice Cream
Mix Ingredients as a Source of Bacteria
Dairy Products as a Source of Bacteria
Sugar as a Source of Bacteria

Stabilizers as a Source of Bacteria
Flavouring Materials as a Source of Bacteria
Strawberries, Raspberries or Black Berries
Peaches
Oranges and Lemons
Bananas and Mangoes
Dried Fruits
Fruit Juices
Nuts
Colours as a Source of Bacteria
Eggs as a Source of Bacteria
Destruction of Bacteria by Pasteurization
Recontamination of the Mix After Pasteurization
The Effect of Ageing on the Bacterial Count
The Effect of Freezing and Hardening on the Bacterial Count.
Bacteriological Standards for Ice Cream
Milk and Milk Products
Ice Cream Defined
Classification of Ice Creams and Related Frozen Foods
Composition of Commercial Ice Cream
The Ingredients Used in the Manufacture of Ice Cream
Quality of Dairy Products for Ice Cream
Sweeteners for Ice Cream
Ice-Cream Stabilizers
Flavouring Materials
Preparation of the Ice-Cream Mix
Technical Skill Necessary
Procedure in Calculating a Mix
Homogenizing the Mix
Ageing the Mix
Quality of Ice Cream
Ice-Cream defects
Body and Texture Defects
Colour Defects
Distribution of Ice Cream
Ice-Cream Making in the Home

13. METHODS OF LABORATORY TESTS

Judging Flavour and Aroma
Gerber Test for Fat in Milk and Cream
SNF and Total Solids in Milk by Lactometer
Analysis of Fat in ice Cream
Ether Extraction Test
Preparation of Sample
Procedure
Gerber Test
Apparatus and Reagents
Preparation of Sample
Procedure
Determination of Total Solids
Mojonnier Total Solids Test
Procedure

AQAC Official Method (AoAC International, 2000)
Determination of Acidity in Plain Ice Cream Mix
Determination of Free Fat in Ice Cream (Free Fat Estimate or FFE Value)
Apparatus and Reagents
Procedure
Calculation
Chromatographic Analysis
Stability to Heat Shock
Meltdown Test and Shape Retention
Farrall Homogenization Index
Measurement of Viscosity
Pipette Method
Borden Flow Meter Method
Brookfield Viscometer
Calculation
Test for Ammonia Leaks
Surface Tension
14. ICE CREAM NOVELTY IMPULSE PRODUCTS 255
Molded Novelties
Extruded Novelties
15. ICE CREAM SHELF-LIFE 259
Temperature Fluctuations and Ice Recrystalliation
The Role of Stabilizers
Maintaining Shelf-Life
16. ICE CREAM INGREDIENTS 263
Milkfat (or "Butterfat") /FAT
Milk solids-Not-Fat
Lactose Crystallization
Sweeteners
Stabilizers
Locust Bean Gum
Emulsifiers
Polysorbate 80

17. MIX CALCULATIONS FOR ICE CREAM AND FROZEN DAIRY DESSERTS

Problem 1
Solution
Problem 2
Solution
Problem 3
Problem 4
Problem 5
Problem 6
Problem 7 (Using Liquid Sweeteners)

18. STRUCTURE OF ICE CREAM

Colloidal Aspects of Structure
Ice Cream Meltdown
Structure from the Ice Crystals

19. THEORETICAL ASPECTS OF THE FREEZING PROCESS

The Process of Crystallization
Importance of Crystallization Rate
Importance of Temperature Fluctuations and
Re-Crystallization
Formation of the Glassy Phase in Frozen Foods
Formation of a Dilute Glass

20. ICE CREAM MANUFACTURE

Blending
Pasteurization
Homogenization
Ageing
Freezing and Hardening
Hardening

21. ICE CREAM FLAVOURS

Introduction
Vanilla
Chocolater and Cocoa
Fruit Ice Cream
Nuts in Ice Cream
Colour in Ice Cream

22. HOMEMADE ICE CREAM

Ingredients Used
Preparation of the Ice Cream Mix
Aging the Mix
Freezing the Mix
Regular Vanilla Ice Cream
Low Calorie Vanilla Ice Cream
Milk Substitute Vanilla Ice Cream
Hints for Making Good Ice Cream

23. ICE CREAM FORMULATIONS

Ice Cream Mix General Compositon
Formulation Considerations
Economy Brands
Standard Brands
Premium Brands
Super-premium Brands
Suggested Mixes

24. AUTOMATIC ICE CREAM BAKING MACHINE

AGC-SERIES
Features
AGC Series
Features
Gas Burners
Scraping Device
Cone Ejector
Stacking Device
Output Details
Baking Process

25. NEW PROCESSING TECHNOLOGY -NEW PREMIUM

3D ICE CREAM PRODUCTS

Enhanced Market Opportunities

Low Capital & Flexibility

26. SAMPLE ICE CREAM CONE DRAWING 331

Design for Cone Diameter 30-40 mm

Design for Cone Diameter 40-50 mm

Design for Cone Diameter 50-56 mm

Design for Sugar Conges

Design for Cups

27. MOLDED CONES & CUPS

Process & Machines

28. ICE CREAM CONE MAKING

Product & Its Application

Market

Raw Material Requirements

Manufacturing Process

Wafer Cone Machine

Technical Parameter

Wafer Cone/Cup Pictures for Reference, Other Size & Shape
can be Customized

29. SUCCESS STORY OF NATURAL ICE CREAM

About Natural Ice Cream

Four Ps of Naturals ice cream

Product

Price

Place

Promotion

Success and the Future

30. SPECIFICATIONS OF ICE CREAM PLANT

1. Pasteurising: 200 Ltr

2. Milk Pump with Filter

3. Homogeniser

4. Ice Cream Mix Phe

5. Cooling Tower

6. Ageing Vat

7. Flavour Tank

8. Continuous Freezer

9. Fruit Feeder

10. S.S. Piping for Ice Cream Mix Plant

11. Skid For Ice Cream Mix Plant

12. Control Panel

13. Hardner Tunnel Model

Equipments and Machinery for Ice Cream Plant
(200 LPH)

Technical Specification

31. PROCESS FLOW DIAGRAM

32. SAMPLE PLANT LAYOUT

33. PHOTOGRAPHS OF MACHINERY WITH SUPPLIER'S CONTACT DETAILS

About NIIR

NIIR PROJECT CONSULTANCY SERVICES (NPCS) is a reliable name in the industrial world for offering integrated technical consultancy services. NPCS is manned by engineers, planners, specialists, financial experts, economic analysts and design specialists with extensive experience in the related industries.

Our various services are: Detailed Project Report, Business Plan for Manufacturing Plant, Start-up Ideas, Business Ideas for Entrepreneurs, Start up Business Opportunities, entrepreneurship projects, Successful Business Plan, Industry Trends, Market Research, Manufacturing Process, Machinery, Raw Materials, project report, Cost and Revenue, Pre-feasibility study for Profitable Manufacturing Business, Project Identification, Project Feasibility and Market Study, Identification of Profitable Industrial Project Opportunities, Business Opportunities, Investment Opportunities for Most Profitable Business in India, Manufacturing Business Ideas, Preparation of Project Profile, Pre-Investment and Pre-Feasibility Study, Market Research Study, Preparation of Techno-Economic Feasibility Report, Identification and Section of Plant, Process, Equipment, General Guidance, Startup Help, Technical and Commercial Counseling for setting up new industrial project and Most Profitable Small Scale Business.

NPCS also publishes various process technology, technical, reference, self employment and startup books, directory, business and industry database, bankable detailed project report, market research report on various industries, small scale industry and profit making business. Besides being used by manufacturers, industrialists and entrepreneurs, our publications are also used by professionals including project engineers, information services bureau, consultants and project consultancy firms as one of the input in their research.

Our Detailed Project report aims at providing all the critical data required by any entrepreneur vying to venture into Project. While expanding a current business or while venturing into new business, entrepreneurs are often faced with the dilemma of zeroing in on a suitable product/line.

NIIR PROJECT CONSULTANCY SERVICES, 106-E, Kamla Nagar, New Delhi-110007, India.
Email: npcs.india@gmail.com **Website:** NIIR.org

Fri, 09 May 2025 05:32:05 +0000