

The Complete Technology Book on Flavoured Ice Cream

Author: NIIR Board of Consultants & Engineers

Format: Paperback

ISBN: 817833013X

Code: NI184

Pages: 448

Price: Rs. 975.00 US\$ 100.00

Publisher: Asia Pacific Business Press Inc.

Usually ships within **5** days

Ice Cream is a favourite food of millions around the world. It is a frozen mixture of a combination of component of milk, sweeteners, stabilizers, emulsifiers and flavours. Ice cream is a palatable, nutritious and relatively inexpensive food. No other food enjoys so much popularity and has as attractive a form and appeal as ice cream. 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. Milk fat is of major importance in ice cream. It contributes rich flavor to the ice cream, is a good carrier for added flavor compounds and promotes desirable tactual qualities. Stabilizers are used to prevent the formation of objectionable large ice crystals in ice cream. Emulsifiers are used to produce ice cream with smoother body and texture, to impart dryness and to improve whipping ability of the mix. Flavour is considered the most important characteristics of ice cream. It has two characteristics; type and intensity. Classification of ice cream may be based on commercial terms commonly agreed upon or on regulatory composition requirements or flavor labeling standards. Commercially ice cream is classified as plain ice cream, chocolate, fruit, nut, frozen custard, confection, bisque, puddings, mousse, variegated ice cream, Neapolitan, ice milk, lacto, novelties, frappe etc. The basic step of production in manufacturing ice cream are composing the mix, pasteurization, homogenization, cooling, ageing, flavouring, freezing, packaging, hardening, storage, loading out products and cleaning of equipments. Ice cream can be mass produced and thus is widely available in developed parts of the world. Ice cream can be purchased in large cartons from supermarkets and grocery stores, in smaller quantities from ice cream shops, convenience stores, and milk bars, and in individual servings from small carts or vans at public events. Ice cream is expected to continue to expand robustly in India as purchasing power increases and as manufacturers invest in expanding the availability of ice cream in small stores.

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, flavour and 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 etc.

It is a comprehensive book which covers all the aspects of manufacturing of ice cream in various flavours. The book is meant for entrepreneurs, technocrats, professionals, researchers, dairy technologists etc.

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
Hydroxypropy 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

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

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
Resistane to Deep Freezing
Leak Proofness
Paper Board
Thickness
Wax Content
Stiffness
Ink
Wax Quality
Adesive
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
AOAC 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

MOLDED NOVELTIES

EXTRUDED NOVELTIES

15. ICE CREAM SHELF-LIFE

Temperature Fluctuations and Ice Recrystalliation

The Role of Stabilizers

Maintaining Shelf-Life

16. ICE CREAM INGREDIENTS

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 COMPOSITION Formulation Considerations
 Economy Brands
 Standard Brands
 Premium Brands
 Super-premium Brands
 Suggested Mixes
24 AUTOMATIC ICE CREAM BAKING MACHINE AGC-SERIES
 Features
 ACG 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
 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
DIRECTORY SECTION

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.

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

Sun, 17 Feb 2019 08:09:05 +0530