

The Complete Technology Book on Cocoa, Chocolate, Ice cream and other Milk Products

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Cocoa, Chocolate and Ice Cream are the products which has a good nutritious value and relatively inexpensive food. Cocoa butter is used in chocolate and to cover other confectionery products. Now a day chocolate and ice cream are gaining good popularity among the society all over the world. Chocolate is a key ingredient in many foods such as milk shakes, candy bars, ice creams etc. It is ranked as one of the most favorite flavors in the world. Despite its popularity, most people do not know the unique origins of this popular treat. Chocolate is a product that requires complex procedures to produce. The process involves harvesting coca, refining coca to cocoa beans, and shipping the cocoa beans to the manufacturing factory for cleaning, coating and grinding. These cocoa beans will then be imported or exported to other countries and be transformed into different type of chocolate products. Ice cream is a frozen dessert usually made from dairy products, such as milk and cream, and often combined with fruits or other ingredients and flavors. The meaning of ice cream varies from one country to another like frozen custard, frozen yogurt, sorbet, and gelato and so on. The ice cream industry has traditionally grown at a healthy rate of 12% per annum. India is the second largest milk producing country. Milk products like butter, curd, ghee, etc have become an essential part of our food and are consumed in good quantity every day. In spite of the huge demand that exists for such milk based items conventional methods are employed for producing these items. The growth in cocoa, chocolate, Ice cream and other milk product industry has been primarily due to strengthening of distribution network and cold chain infrastructure.

Some of the fundamentals of the book are cocoa bean production, sources of cocoa bean supplies, refining for production of chocolate masses for different uses, shipment of cocoa beans, cocoa processes , cocoa for drinking, instant cocoas, drinking chocolates manufacturing cocoa, cocoa butter & replacement fats , coatings and cocoa , chocolate manufacture, chocolate bars and covered confectionery , chocolate molding, determination of fat in cocoa and chocolate products, determination of cooling curve of cocoa butter and similar fats, the manufacture of dairy products, ice cream manufacture, energy value and nutrients of ice cream etc.

The present book contain formulae, processes and other relevant details related to manufacture of cocoa products, chocolates, ice cream and other milk products. An attempt has been made to bring in to focus the significant aspect of cocoa products, dairy products manufacturing. It is hoped that the subject matter contain and its presentation will be very helpful to new entrepreneurs, professionals, institutions, technocrats and students etc.

1. COCOA BEAN PRODUCTION

Introduction

Botanical types

The preparation of cocoa beans

Fermentation

Drying

The cut test

Sources of cocoa bean supplies

Shipment of cocoa beans

Infestation of cocoa

Microbiology of cocoa

2. COCOA MASS, COCOA POWDER, COCOA BUTTER

Introduction

Cocoa mass

Cocoa powder

Cocoa butter

Quality control

3. PARTICLE SIZE REDUCTION

Introduction

Current types of particle size reduction process

Grinding cocoa nib into cocoa mass

Refining of chocolate masses

The roll refiner

Refining for production of chocolate masses for different uses

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Raw Bean Cleaning

Roasting

The NARS Process

Micronizer

Roasting of Nib

Sterilization

Alkalization

Cocoa Liquor Treatment

Winnowing (Cracking & Fanning)

Winnowing Machines

Large nib:

Small nib:

Nib dust (fine nib)

Shell dust, small shell, cyclone dust

Large shell

NIB GRINDING, COCOA LIQUOR, HEAT TREATMENT

Ball or Bead Mills

PROCESSING OF COCOA LIQUOR

Flavour Development Processes

(The following is a summary of the methods used.)

Simple Heating of Thin Films

Thin Film Roasting and Air Scrubbing

Thin Film Roasting with Vacuum

General Comments

ALKALIZATION

Alkalization of Nibs

Alkalization of Liquor

Drying, Roasting, Pressing, and Grinding

Alkalization of Cocoa Cake

Alkalization of Whole Beans

Water Treatment

LIQUOR PRESSING

Temperature of the Liquor

Moisture Content

Degree of Roast/Protein Coagulation

Homogenizing

Particle Size

Pressures

EXPELLER PRESSING

COCOA GRINDING

Cocoa Fineness

COCOA FOR DRINKING, INSTANT COCOAS, DRINKING CHOCOLATES MANUFACTURING

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Drinking Cocoa

Instant Cocoa

Drinking Chocolate

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Cocoa Composition and Specifications

Contamination and Adulteration of Cocoa Powder

5. Cocoa Butter & Replacement Fats

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Prime Pressed Cocoa Butter

ExpellerPressed Cocoa Butter

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New Sources of Supply Natural Variations

Supercooling, Cooling Curves

Crystallization, Polymorphism

Hardness, Penetration

Contraction

Solvent Extraction of Cocoa Butter

Refining of SolventExtracted Fat

Deodorization of Cocoa Butter

COCOABUTTER REPLACEMENT FATS

Equivalent Fats (CBE)

Substitute Fats (CBS)

Other Fats Associated with Cocoa Butter

Allied Fats

6. EMULSIFIERS IN CHOCOLATE CONFECTIONERY

7. COATINGS AND COCOA

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Soya Lecithin

Other Vegetable Lecithins

Fractionated and Modified Vegetable Lecithins

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SYNTHETIC PHOSPHOLIPIDS AND MODIFIED VEGETABLE LECITHINS

Toxicity Checks on YN

Viscosity

Other Physical Effects of Lecithin Addition

Other Surface Active Compounds

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VISCOMETERS

Simple Viscometers

Rotational Viscometers

The Gardner Mobilometer

USE OF LECITHIN IN CHOCOLATE, COCOA POWDER, CHOCOLATE DRINKS

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Cocoa and Drinking Chocolate Powders

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Sugar and Other Sweeteners

Cocoa Butter

Milk Products

Emulsifiers

Other Fats

FLAVOUR

REWORK

CHOCOLATE PROCESSES

Preparation of Ingredients

Mixing

Refining

Milk Chocolate Processes

Conching

Other Conches and Chocolate Making Systems

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Chocolate Tempering

Compound Coatings

Measurement of Degree of Temper

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The Westal SCB Process

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Enrober Coolers

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Who Controls Quality?

How Should Quality Control Be Organized?

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The Supplier

PROCESS CONTROL

InLine Process Control

FINISHED PRODUCT INSPECTION

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Incidence of Sampling Taste Checks

Weight Control

Shelf Life Keeping Limits and Keeping Tests

Microbiological Quality Control

Food poisoning

Factory Hygiene and Sanitation

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Methods of Determination

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Metriscope

Method of Determination

Microscopes

Sieving Methods for Determining Particle Size

Elutriation (Sedimentation) Methods

Particle Sizing by Laser Beam

The Coulter Counter

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Rapid Methods using Trichlorethylene Extraction

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Determination of Cooling Curve of Cocoa Butter and Similar Fats

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The Melting Point of Fats

Determination of Fusion, Slip and Clear points

Determination

Softening Point of Fats

Barnicoat Method

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Foam Test Modified Bickerman Method

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RELATIVE HUMIDITY

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Calculation of A/W/ERH

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Refractometers

1. Traditional Method

2. Standardized Method

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Packaging and Storage

Keeping Quality

Increasing Keeping Quality

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1. Whole Milk Dahi

2. Skimmed Milk Dahi

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3. Traditional Process

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CURD (DAHI)

DEFINITION

CLASSIFICATION

FOOD AND NUTRITIVE VALUE

COMPOSITION

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SWEET SOUR DAHI

1. Traditional Method

2. Standardized Method

SWEETENED DAHI

Market Quality

Packaging and Storage

Keeping Quality

Increasing Keeping Quality

Dahi Powder

1. Whole Milk Dahi

2. Skimmed Milk Dahi

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Drying

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ENERGY VALUE AND NUTRIENTS

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Relative Sweetness

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Nonnutritive Sweeteners

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Preparing Chocolate Syrup

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PROCEDURES AND RECIPES

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About NIIR

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