

Handbook on Fruits, Vegetables & Food Processing with Canning & Preservation (3rd Edition)

Author: NPCS Board

Format: Paperback

ISBN: 9788178330839

Code: NI19

Pages: 688

Price: Rs. 1,475.00 **US\$** 150.00

Publisher: Asia Pacific Business Press Inc.

Usually ships within **5** days

Natural foods such as fruits and vegetables are among the most important foods of mankind as they are not only nutritive but are also indispensable for the maintenance of the health. India is the second largest producer of fruits and vegetables in the world. Fertile soils, a dry climate, clean water and abundant sunlight help the hard working farmers to produce a bountiful harvest. Although there are many similarities between fruits and vegetables, there is one important difference that affects the way that these two types of crop are processed like fruits are more acidic than vegetables. Food processing is the set of methods and techniques used to transform raw ingredients into food or to transform food into other forms for consumption. Food processing typically takes clean, harvested crops or butchered animal products and uses these to produce attractive, marketable and often long shelf-life food products. Canning is a method of preserving food in which the food is processed and sealed in an airtight container. Food preservation is the process of treating and handling food to stop or greatly slow down spoilage (loss of quality, edibility or nutritive value) caused or accelerated by micro organisms. One of the oldest methods of food preservation is by drying, which reduces water activity sufficiently to prevent or delay bacterial growth. Drying also reduces weight, making food more portable. Freezing is also one of the most commonly used processes commercially and domestically for preserving a very wide range of food including prepared food stuffs which would not have required freezing in their unprepared state. Fruits and vegetable processing in India is almost equally divided between the organized and unorganized sector, with the organized sector holding 48% of the share. The present book covers the processing techniques of various types of fruits, vegetables and other food products. This book also contains photographs of equipments and machineries used in fruits, vegetables and food processing along with canning and preservation. This book is an invaluable resource for new entrepreneurs, food technologists, industrialists etc.

Contents

1. Characteristics of the Food Industry

Components of the Food Industry

Allied Industries

Interrelated Operations

2. Food Quality Assurance

The Need

A Role for Government

Microbiological Standards
A Role for Industry
Design of Company QA Program
Objectives
Raw Material Quality Assurance
In-process Quality Assurance
Finished Product Quality Assurance

3. Quality Factors in Foods

Appearance Factors
Color and Gloss
Consistency
Textural Factors
Measuring Texture
Texture Changes
Flavor Factors
Additional Quality Factors
Quality Standards
Planned Quality Control
4. Preserve, Candied and Crystallized Fruits and Vegetables
Preserve
General considerations
Candied Fruits/Vegetables
Process
Glazed Fruits/Vegetables
Crystallized Fruits/Vegetables
Problems in Preparation of Preserves and Candied Fruits

5. Food Preservation by Fermentation

Life with Microorganisms
Fermentation of Carbohydrates
Industrially Important Organisms in Food Preservation
Order of Fermentation
Types of Fermentations of Sugar
Fermentation Controls
Wine
Preservation
Sterilization Filtration
Beer
Vinegar Fermentation
Principles of Vinegar Fermentation
Vinegar Making
Preparation of Yeast Starter
Alcoholic Fermentation
Acetic Fermentation
Cheese
Kinds of Cheese
Cottage Cheese
Swiss Cheese
Blue Cheeses

6. Chemical Preservation of Foods

What Are Food Additives?

- Importance of Chemical Additives
- Legitimate Uses in Food Processing
- Undesirable Uses of Additives
- Safety of a Food Additives
- Functional Chemical Additive Applications
- Specific Uses of Chemical Additives
- Additives Permitted and Prohibited in the United States
- Chemical Preservatives
- Microbial Antagonists
- Sorbic Acid
- Antibiotics
- Quality Improving Agents
- Other Chemical Additives
- Artificial Flavoring
- Artificial Coloring

7. Cold Preservation and Processing

- Distinction Between Refrigeration and Freezing
- Refrigeration and Cool Storage
- Requirements of Refrigerated Storage
- Controlled low Temperature
- Air Circulation and Humidity
- Modification of Gas Atmospheres
- Changes in Food During Refrigerated Storage
- Freezing and Frozen Storage
- Initial Freezing Point
- Freezing Curve
- Changes During Freezing
- Choice of Final Temperature
- Food Composition
- Noncompositional Influences
- Freezing Methods
- Air Freezing
- Packaging Considerations
- Some Additional Developments

8. Heat Preservation and Processing

- Sterilization
- Commercially Sterile
- Pasteurization
- Blanching
- Selecting Heat Treatments
- Heat Resistance of Microorganisms
- Thermal Death Curves
- Margin of Safety
- Heat Transfer
- Conduction and Convection Heating
- Cold Point in Food Masses
- Determining Process Time and Process Lethality
- Protective Effects of Food Constituents
- Different Temperature-Time Combinations
- Heating Before or After Packaging

9. Food Pickling and Curing

Pickled Fruits and Vegetables

Use of Salt Stock

Sour Pickles, Sweet Pickles, Processed Dill Pickles

Sauerkraut

Olives

Fermented And Pickled Products

Deterioration

Nutritional Value

Bloater Damage Control

Controlled Fermentations in Commercial Brining Tanks

Brine Recovery

Defect Reduction

The Principles of Fish Salting

The Influence of the Composition of Salt

Commercial Methods of Salting Fish

Brine-salting

Dry-salting

Comparative Efficiency of Brine-salting and Dry-salting

Some-curing Processes

Cold-smoking (Heavy Salt Cure)

Smoked Salmon

Hard-smoked Salmon

Meat Curing and Smoking

Pickled Meats

Salt

Sugar and Corn Syrup Solids

Nitrite and/or Nitrate

Nitrosamines

Phosphates

Sodium Erythorbate

Cured Meat Color

Role of Nitrite and/or Nitrate in Meat Color

Sausages and Table-ready Meats

Dry Sausage Manufacture

Processing

Fermentation

10. Food Preservation by Drying

Drying-A Natural Process

Dehydration-Artificial Drying

Dehydration vs. Sun Drying

Why Dried Foods?

Dehydration Permits Food Preservation

Humidity-Water Vapor Content of Air

RH-The drying Medium

Types of Driers

Adiabatic Driers

Heat Transfer through a Solid Surface

Criteria of Success in Dehydrated Foods

Freeze-Dehydration (Freeze Drying)

Triple Point of Water

Temperature Changes in Meat Freeze-dehydration

Influence of Dehydration on Nutritive Value of Food

Dehydration of Fruits

Dehydration of Vegetables

Dehydration of Animal Products

Dehydration of Fish

Dehydration of Milk

Dehydration of Eggs

Packaging of Dehydrated Foods

11. Food Preservation by Canning 1

Temperature vs. Pressure

Heat Resistance of Microorganisms Important in Canning

Factors Influencing the Heat Resistance of Spores

Heat Resistance of Enzymes in Food

Heat Penetration into Food Containers and Content

Storage of Canned Foods

External Corrosion of Cans

Coding the Pack

Influence of Canning on the Quality of Food

Color

Flavour and Texture

Protein

Improvements in Canning Technology

Retort Pouches

Testing a Good Seal

Hazard Analysis

12. Pickles

Preservation with Salt

Preservation with Vinegar

Preservation with Oil

Preservation with Mixture of Salt, Oil, Spices and Vinegar

Problems in pickle making

13. Chutneys and Sauces/Ketchups

Chutneys

Recipes for chutneys

Sweet mango chutney

Apple chutney

Plum chutney

Wood apple chutney

Apricot chutney

Papaya chutney

Tomato chutney

Aonla chutney

Sauces (Ketchups)

Recipes for sauces (ketchups)

Tomato sauce

Apple sauce

Plum sauce

Papaya sauce

Mushroom sauce

Aonla sauce

Problem in the preparation of sauces/ketchups

14. Mushroom Processing

Dehydration

Preparation of ketchup

Preservation with salt and acetic acid

Pickling

Canning

Mushroom poisoning

15. Tomato Processing

16. Jam, Jelly and Marmalade

Jam

Problems in jam production

Jelly

Important considerations in jelly making

Pectin

Acid

Sugar

Judging of end-point

Marmalade

After pectin extraction

17. Freezing of Fruits and Vegetables

Preparation of fruits/vegetables for freezing

Methods of freezing

Sharp freezing (Slow freezing)

Quick freezing

By direct immersion

Advantages

Disadvantages

By indirect contact with refrigerant

By air blast

Cryogenic freezing

Dhydro-freezing

Freeze-drying

Changes during freezing and storage for frozen products

Freezing process for fruits and vegetables

18. Vinegar

Types of vinegar

Steps involved in vinegar production

Outline Scheme of Vinegar Production

Preparation of vinegar

Slow process

Orleans slow process

Quick process (Generator or German process)

Precautions

Problems in vinegar production

19. Drying and Dehydration of Fruits and Vegetables

Advantages of dehydration over sun-drying

Spoilage of dried products
Reconstitution test for dried/dehydrated products
Reconstitution test

20. The Canning Process

Cans
Types of Cans
Square and Pullman Base
Pear Shaped
Round Sanitary
Drawn Aluminum
Oblong
Can Materials
Retorts
Nonagitating Retorts
Continuous Agitating Retorts
Hydrostatic Retorts
Establishment of Retort Schedule
Pasteurized Canned Products
Closing
Pasteurizing Cook
Cooling
Storage and Shelf Life
Aseptic Canning

21. Food Freezing

Development of a Frozen Food Industry
The Freezing Point of Foods
Percentage Water Frozen vs. Temperature of Food and
Its Quality
Size of Ice Crystals Formed
Volume Changes During Freezing
Refrigeration Requirements in Freezing Foods
Freezing in Air
Freezing by Indirect Contact with Refrigerants
Direct Immersion Freezing
Packaging Requirements for Frozen Foods
Influence of Freezing on Microorganisms
Influence of Freezing on Proteins
Influence of Freezing on Enzymes
Influence of Freezing on Fats
Influence of Freezing on Vitamins
Freezing of Bakery Products
Packaging
Storage Life of Frozen Bread
Cookies and Cakes
Frozen Dairy Foods
The Ice Cream Industry
Basic Ingredients
Manufacture of Ice Cream
The Mix
Pasteurization
Homogenization

- Cooling
- Freezing
- Hardening
- Hazard Analysis
- Hazard Categories

22. Cookie and Cracker Production Technology

- Ingredients Handling
- Mixing
- Dough Relaxation and Fermentation
- Dough Machining and Forming
- Dough Relaxing
- Cutting Stage
- Scrap Return
- Salter or Sugar Sprinkling
- Rotary Molding
- Extruder-Dough Formers
- Wire Cut
- Rout Press
- The Fruit Bar Coextruder
- Baking
- Direct-Fired Ovens, Gas Fired
- Convection (Indirect) Ovens
- Post Conditioning
- Secondary Processes
- Icings
- Enrobing
- Sandwiched Cookies and Crackers
- Biscuit Packaging

23. Snack Foods

- Introduction
- Popcorn
- Four Types of Popcorn
- Mechanism of Popping
- Quality factors
- Processing
- Formulated Puffed Snacks
- Ingredients
- Other Grain Products
- Expandable Ingredients
- Frying Fats
- Antioxidants
- Sweeteners
- Other Ingredients
- Extruders and Extruding
- Types of Extruders
- Snacks that Are Cooked and Formed
- Drying

24. Breakfast Cereals

- Introduction
- Present Status

Processing of Hot-serve Cereals
Wheat Cereals
Corn Cereals
Oat Cereals
Processing Ready-to-Eat Breakfast Cereals
Flakes
General Considerations
Corn Flakes
Wheat flakes
Bran Flakes
Shreds
Shredded Wheat Biscuits
Puffed Cereals
General Considerations
Oven-puffed Rice
Puffing by Extrusion
Sugar-coated Products
Ovens

25. Canned Meat Formulations

Corned Beef Hash
Federal Meat Inspection Regulations
Preparation
Meat
Potatoes
Onions
Canning
Beef Stew
Federal Meat Inspection Regulations
Preparation
Meat
Potatoes
Carrots
Onions
Preparation
Canning
Chili Con Carne
Federal Meat Inspection Regulations
Preparation
Canning
Vienna Sausages
Federal Meat Inspection Regulations
Preparation
Canning
Meat Balls with Gravy
Federal Meat Inspection Regulations
Preparation
Canning
Sliced Dried Beef
Federal Meat Inspection Regulations
Preparation
Drying and Smoking
Canning

Luncheon Meat
Federal Meat Inspection Regulations
Preparation
Canning
Processing
Sterile
Pasteurized
Potted Meat
Federal Meat Inspection Regulations
Preparation
Canning
Canned Hams-Pasteurized and Sterile
Federal Meat Inspection Regulations
Preparation
Smoking
Canning
Filling and Pressing
Closing
Processing
Pasteurized
Sterile
Plastic Packaged Hams
Preparation
Packaging
Processing

26. Cured or Smoked Meats

Hams
Classification of Ham
Internal Temperature
Added Substance
Presence of Bone
Commercial Ham Manufacture
Curing
Smoking/Cooking
Cooked Ham
Baked Ham
Preparation
Country Ham
Preparation
Westphalian Ham
Preparation
Scotch Ham
Prosciutti Ham
Preparation
Honey Cured Hams
Preparation
Bacon
Canadian Bacon
Wiltshire Bacon
Beef Bacon
Jowl Bacon
Fat Backs and Heavy Bellies

Smoked Pork Loin
Picnic
Shoulder Butt
Corned Beef
Smoked Fresh Meat
Dried Beef
Procedure
Smoked and Cured Lamb
Smoked Tongue
Pickled Pigs Feet

27. Sausage Formulations

Ground Sausages

Instructions

Instructions

Instructions

Instructions

Instructions

Instructions

Semidry or Summer Sausages

Instructions

Instructions

Instructions

Instructions

Dry Sausages

Instructions

Instructions

Instructions

Emulsion-Type Sausages

Instructions

Instructions

Instructions

Instructions

Instructions

Instructions

Instructions

Instructions

Liver Sausage and Braunschweiger

Instructions

Instructions

Instructions

Speciality Items

Instructions

Instructions

Instructions

Instructions

Instructions

Instructions

Instructions

Instructions

Instructions

Instructions

Mortadella
Linguica (Portuguese Sausage)

Instructions
Instructions

28. Processing of Rice

Introduction

Quality of Rice

Milling of Rice

Small-scale Milling

Modern Conventional Milling

Abrasive Milling of Rice

Lye-peeling

Extractive Milling

Rice Flour

Further Processing of Rice

Boiling and Steaming

Parboiling

Quick-cooking Rice

Shelf-stable Cooked Rice

Rice Cakes

Rice Milk

29. Creaming, Emulsions, and Emulsifiers

Emulsifier and Emulsions

Classification

Hydrophilic-Lipophilic Balance (HLB)

Oil-in-Water Emulsions

Type of Emulsifier used in Cookies and Crackers

Phosphatides and Lecithin

Synthetic Emulsifiers

Function of Emulsifiers in Cookies and Crackers

Eggs

Emulsifier

Mixing Operation in Cookie and Cracker Doughs

Mixing Operation

Creaming Method

Two-stage Method

Three-stage Method

Baking Cookies and Crackers

Emulsion Stability

Viscosity

To Lower Viscosity

To Increase Viscosity

Elevated Temperature

Inversion Phase

Phase Equilibria

Batter Aeration

30. Principles of Food Packaging

Introduction

Functions of Food Packaging

Requirements For Effective Food Packaging

Types of Containers

Primary, Secondary, and Tertiary

Form-Fill-Seal Packaging
Hermetic Closure
Food-Packaging Materials and Forms
Metal
Metal Cans
Can Construction
Can Corrosion
Can Sizing
Glass
Glass Containers
Paper, Paperboard, and Fiberboard
Plastics
Laminates
Retortable Pouches and Trays
Edible Films
Wood and Cloth Materials
Package Testing
High Barrier Plastic Bottles
Aseptic Packaging in Composite Cartons
Military Food Packaging

Directory Section
Suppliers of the Plant and Machinery
Addresses of Packaging Machinery
Suppliers of Raw Material Suppliers

Machinery & Equipments (Photographs)

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

