

# Modern Technology on Food Preservation (2nd Edition)

**Author:-** NPCS Board

**Format:** paperback

**Code:** NI88

**Pages:** 528

**Price: Rs.1275US\$ 125**

**Publisher:** NIIR PROJECT CONSULTANCY SERVICES

Usually ships within **5** days

Food Preservation has become an integral part of the food processing industry. There are various methods of food preservation; drying, canning, freezing, food processing etc. Food processing is one the method of food preservation which is the set of methods and techniques used to transform raw ingredients into food or to transform food into other forms for consumption by humans or animals either in the home or by the food processing industry. Canning is one of the various methods of food preservation in which the food is processed and then sealed in an airtight container. This process prevents microorganisms from entering and proliferating inside. Dehydration is the process of removing water or moisture from a food product. Food dehydration is safe because water is removed from the food. 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. Benefits of food processing include toxin removal, preservation, easing marketing and distribution tasks, and increasing food consistency. In addition, it increases seasonal availability of many foods, enables transportation of delicate perishable foods across long distances and makes many kinds of foods safe to eat by deactivating spoilage and pathogenic micro organisms. Nanotechnology exhibits great potential for the food industry. New methods for processing nanostructures are being developed having novel properties that were not previously possible. As such, due to the recent up gradation of preservation techniques, the preservation industry is also growing almost at the same rate as the food industry which is about 10 to 12% per year. The purpose of this book is to present the elements of the technology of food preservation. It deals with the products prepared from various fruits and vegetables commercially. Relevant information on enzymes, colours, additives, flavours, adulteration, etc., has been given. This book also contains photographs of equipments and machineries used in food preservation. This book will be very useful for new entrepreneurs, food technologists, industrialists, libraries etc.

## 1. Introduction of Food Technology

Source of Man's Food

Impact of Science and Technology

## 2. Acceptable Food to Eat

Nature's Seal of Quality

Food Flavors

Food Colors

Our Senses Can Fail Us

Excessive Heating Impairs Foods,

Moderate Heating May Improve Foods  
Food Spoilage  
Must Deter Natural Processes  
Safe Food for Man  
Food Poisoning  
Food Intoxications  
Food Infections  
Sanitation and Health

### 3. The Refrigerated Storage of Perishable

Commodities  
Temperature of Objects  
Temperature Measurements  
Metabolism a Function of Temperature  
Energy Deficit of Ice  
Creating Energy Deficits Mechanically  
Keeping Fresh Foods Edible  
Animals Foods  
Plant Food  
Temperature of Cold Storage Rooms  
Humidity of Storage Chamber  
Heat Evolved by Living Tissues  
Specific Heat of Foods  
Calculation of Refrigeration Load  
Cold Injury of Fruits and Vegetables  
Ammonia Injury to Refrigerated Fruits and Vegetables  
Waxing Foods to Prevent Shrinkage  
Effect of Cold Storage on Quality  
Preserving Foods in a Micro-Environment  
Packaging Materials Tests Which May Be Performed  
Formed Container Tests  
Disorders of Stored Foods

### 4. Principles of Food freezing

Development of a Frozen Food Industry  
The Freezing Point of Foods  
Per Cent Water Frozen vs. Temperature of Food  
and Its Quality  
Size of Ice Crystals Formed  
Volume Changes During Freezing  
Refrigeration Requirements in Freezing Foods  
Establishing the Refrigeration Requirements to  
Freeze Food  
Freezing in Air  
Freezing by Indirect Contact with Refrigerants  
Direct Immersion Freezing  
Freezerburn  
Packaging requirements for Frozen Foods  
Influence of Freezing on Micro-organisms  
Influence of Freezing on Proteins  
Influence of Freezing on Enzymes  
Influence of Freezing on Fats  
Influence of Freezing on Vitamins

Influence of Freezing on Parasites  
Thawing Damage to Frozen Foods

## 5. Principles of 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  
Air-The Drying Medium  
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  
Influence of Drying on Micro-organisms  
Influence of Drying on Enzyme Activity  
Influence of Drying on Pigments in Foods  
Dehydration of Fruits  
Dehydration of Vegetables  
Dehydration of Meat  
Dehydration of Fish  
Dehydration of Milk  
Dehydration of Eggs  
Packing of Dehydrated Foods  
Influence of Drying on Food Acceptance

## 6. Principles of Food Preservation by Canning

The Art of "Appertizing"  
Temperature vs. Pressure of Boiling Water  
Spoilage of Food Caused by Micro-organisms  
Evolution of Containers for Canning  
Important Food Groups  
Micro-organisms Associated with the Food Groups  
Sources of Spoilage Organisms  
Heat Resistance of Micro-organisms  
Important in Canning  
Factors Influencing the Heat Resistance of Spores  
Influence of Food Ingredients on Heat Resistance of Spores  
Heat Resistance of Enzymes in Food  
Heat Penetration into Food Containers and Contents  
General Method for Calculating the Process Time for Canned Foods  
Inoculated Pack Studies  
Adequacy of Heat Processes  
Spoilage of Canned Foods  
Microbial Spoilage  
Failure of Glass Containers  
Surface Markings on Broken Glass

Vacuum-pressure Relations in Canning Process  
Storage of Canned Foods  
External Corrosion of Cans  
Coding the Pack  
Influence of Canning on the Quality of Food  
Colour  
Flavor and Texture  
Protein  
Fat and Oil  
Carbohydrates  
Vitamins  
Misconceptions Relating to Canned Foods  
Improvements in Canning Technology

7. Principles of Food Preservation by Fermentation  
and Pickling  
Life with Micro-organisms  
Fermentation of Carbohydrates  
Industrially Important Organisms in Food  
Preservation  
Order of Fermentation  
Types of Fermentations of Sugar  
Fermentation Controls  
Sources of Salt  
Wine and Beer  
Salted-Fermented Foods  
Deterioration of Fermented and Pickled Products  
Nutritional Value of Pickled Products  
Future Trends

8. Preservation of Food as Sugar Concentrates  
Concentrated but moist  
High solids high acid foods  
Jelly  
Jam  
Fruit Butter  
Marmalade  
Pectin and gel formation  
Invert Sugar  
Jelly Making  
Other Fruit Preserves  
Candied and Glacé Fruits  
Maraschino Cherries  
Sweetened Condensed Milk  
Future Trends

9. Preservation of Foods with Chemical  
additives  
Introduction  
Definition of Chemical Additive  
Importance of Chemical Additives  
Legitimate Uses in Food Processing  
Undesirable Uses of Additives

Safety of a Food Additive  
Functional Chemical Additive Applications  
Historical Significance  
Specific Uses of Chemical Additives  
Additives Permitted and Prohibited in the  
United States  
Chemical and Use  
Food Regulation and Compliance  
Miller Pesticide Amendment of 1954  
1958 Food Additives Amendment  
1960 Color Additives Amendment  
Chemical Preservatives  
Preservatives (Antimycotics)  
Specified Uses and Amounts  
Preservatives (general)  
Specified Use  
Microbial Antagonists  
Antibiotics  
Quality Improving Agents  
Other Chemical Additives  
Artificial Flavoring  
Artificial Coloring  
Other Agents  
Chemical Additives and the Future

10. Preservation of Food with Ionizing Radiations  
A Place for Radiation Stabilized Foods  
Discovery of Radioactivity  
Alpha, Beta and Gamma Radiations  
Dosimetry  
Dose Distribution  
Induced Radio-Activity in Treated Food  
Mode of Action of Ionizing Radiations  
Radiation Effects on Micro-organisms  
Radiation Effects on Proteins  
Radiation Effects on Enzyme Systems  
Effects of Radiation on Amino Acids  
Effects of Radiation on Vitamins  
Radiation Effects on Carbohydrates  
Radiation Effects on Lipids  
Radiation Effect on Pigments  
Radiation Effect on Parasites and Insects  
Packaging of Radiation Stabilized Foods  
General Methods for establishing Radiation  
Stabilization Process for Foods  
The Food Product-Micro-organism Destruction  
Dose Requirements for the Radiation Sterilization  
of Foods  
Technological aspects of the Radiation Pasteurization  
of Foods  
Radiation Resistant Organisms  
Factors Influencing the Survival of Micro-organisms  
from a Radiation Process

The Influence of the Type of Radiation on the Inactivation of Micro-organisms  
The Influence of Dose Rate on the Inactivation of Micro-organisms  
The Influence of Environmental Conditions on the Survival of Micro-organisms from a Radiation Process  
Combination Processes  
Conditions after Irradiation Affecting Survival and Recovery of Micro-Organisms  
The Food Product-Enzyme Destruction  
Process for Radiation Sprout Inhibited White Potatoes  
Process for Insect De-infestation of White Flour by Irradiation  
The Process for Food Stabilization  
Process-Heat Inactivation of Enzymes plus Radiation Destruction of Micro-organisms  
Process and Product Specifications  
Process for Radiation-Pasteurized Plant Tissues (Fruits)  
Process for Radiation-Pasteurized Animal Flesh (Sliced Bacon)  
Process for Radiation-Sterilized Meat (Chicken), Fish and Vegetables  
Non-Heat Method for Controlling Enzymes in Meat  
Design of Radiation Processing Food Plants  
Wholesomeness of Radiation Stabilized Foods  
Some Public Health aspects of the Microbiology of Irradiated Foods  
Acceptability of Radiation Stabilized Foods  
Quality Control with Radiation Stabilized Foods  
Ionizing Radiations as a Unit Operation in the Food Industry

## 11. Preservation of Semi-moist Foods

Introduction  
Canned white bread  
Storage stability  
Sponge and Dough  
Filling and Proofing  
Processing  
Finished Product  
Fungistatic and fungicidal agents  
Sorbic acid  
Polyethylene  
Semi-moist Pet Foods  
Process for Semi-moist Pet Foods  
Marbled, Textured Product  
Water Activity  
Production of Semi-moist Products Growing  
Semi-moist Human Foods  
Coarse Ground Beef and Beef Cubes  
Other Products being developed

## 12. Principles and Preservation of Bakery

Products

Introduction

Principles of Baking

Dough

Influence of Flour Proteins

Flour Improvers

Other Components of Flour

Yeast Raised Dough Products

Heat Generated During Mixing Doughs

Heat of Hydration

Cooling Requirements

Continuous Bread Making Process

Typical Formulations for Yeast Raised

Bakery Products

Baking Schedules

Baking Reactions

Chemically Leavened Bakery Products

Leavening Acids

Baking Powders

Elements of Cookie Technology

Cookie Flour

Sugar

Shortening

Eggs

Ammonia

Water

Baking Acids

Soda

Miscellaneous Ingredients

Mixing and Baking

Quality Cookie Chart

Elements of Cake Technology

General Rules for Formulating Cakes

Cake Formulations

Principles of Processing Cakes

Baking

Refrigerated Doughs

Preservation of Bakery Products

Fresh Bakery Products

Freezing of Bakery Products

Packaging

Storage Life of Frozen Bread

Cookies and Cakes

Nutrient Losses in Bakery Products

Packaged Fresh Bread

Packaged Fresh Cookies, Crackers, Bakery Goods,

Cake Mixes

The Future

## 13. Storage Stability of Preserved Foods

Introduction

Relationships of Product Qualities and Storage conditions  
Objective Tests of Quality of Stored Foods  
Objective Odor Measurements  
Mechanical Texturemeter  
Long-term Storage of Preserved Foods  
Temperature of Storage  
Nutrients  
Containers for Long-Term Storage  
Storage Costs  
Storage Stability of Selected Frozen Foods  
Result  
The Future

#### 14. Food Preservation Using Ozone

Introduction

- Physicochemical Properties of Ozone
- Use of Ozone in Storage and Packing Facilities
- Extension of Storage Life with Ozone
- Ozonation to Sanitize packing Line Process Water
- The Commercial Production of Ozone
- Importance of Ozone in Fishing Industry
- Future Perspectives

#### 15. Food Preservation by Smoking Process

Introduction

- Types of Smoking
- The Difference between Curing and Smoking
- Meat Curing and Smoking
- Types of Smokers

#### 16. Thermal Food Preservation

Introduction

- Effect of Preservation Temperatures
- Effect of Processing on Nutrients in Foods
- Thermal Preservation Methods

#### 17. Machinery & Equipments (Photographs)

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.

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](mailto:npcs.india@gmail.com) **Website:** [NIIR.org](http://NIIR.org)

Thu, 01 May 2025 10:30:16 +0000