

# **The Complete Technology Book on Processing, Dehydration, Canning, Preservation of Fruits & Vegetables (Processed Food Industries) 5th Revised Edition**

**Author:-** NIIR Board of Consultants & Engineers

**Format:** paperback

**Code:** NI65

**Pages:** 472

**Price: Rs.1950US\$ 150**

**Publisher:** NIIR PROJECT CONSULTANCY SERVICES

Usually ships within **5** days

"The Complete Technology Book on Processing, Dehydration, Canning, Preservation of Fruits & Vegetables (Processed Food Industries)" is a comprehensive resource for professionals, students, entrepreneur, startups and hobbyists interested in the field of food & vegetables processing and preservation. This book provides an in-depth look at the various methods and technologies used in the preservation of fruits and vegetables, ensuring their longevity and enhancing food security. It covers a broad spectrum of topics, from general procedures for fruit and vegetable preservation to specific techniques like chemical preservation, fermentation, and canning.

The book begins with an overview of the importance of food preservation and the role it plays in reducing waste, improving food availability, and maintaining the nutritional value of food. It then delves into general procedures for preserving fruits and vegetables, offering insights into the selection, preparation, and pre-treatment processes necessary for successful preservation.

Chemical preservation of foods is covered extensively, providing readers with knowledge on the additives and preservatives that inhibit the growth of microorganisms and prevent spoilage. Fermentation as a method of preservation is another key topic. The book explores the science of food preservation by fermentation, detailing the processes involved in creating fermented beverages and foods. Canning fruits and the preparation of syrups and brines for canning are thoroughly explained, showcasing the techniques for sealing in freshness and flavor. The book provides step-by-step instructions for canning various fruits, ensuring readers can safely and effectively preserve their produce. The fruit beverages, fermented beverages, jams, jellies, and marmalades is discussed in book. These sections offer recipes, tips, and tricks for creating high-quality products.

A significant portion of the book is dedicated to tomato products, chutneys, sauces, and pickles, illustrating the diverse ways in which tomatoes and other vegetables can be processed and preserved. The book provides practical guidance on creating a variety of tomato-based products, as well as flavorful chutneys, sauces, and pickles. The factory layouts, machinery, equipment and photographs with suppliers contact details are also given.

Finally, the book covers the preparation of vegetables for processing, including cleaning,

cutting, and blanching as well as the production of vegetable juices, sauces, and soups.

"The Complete Technology Book on Processing, Dehydration, Canning, Preservation of Fruits & Vegetables" is a valuable resource for anyone looking to delve into the world of food preservation. It combines scientific principles with practical advice, making it an essential guide for those in the processed food industries, as well as home preservers seeking to enhance their skills and knowledge.

1. Introduction 1.1 Understanding the Process 1.2 Benefits of Fruit and Vegetable Processing 1.3 Freezing 1.3.1 Freezing Equipment 1.3.2 Methods of Freezing 1.4 Dehydration 1.4.1 Equipments Used for Dehydration 1.5 Canning 1.5.1 Requirements 1.5.2 Equipments Required for Canning 1.5.3 Specifications 1.6 Process of Canning 1.6.1 Selection of Fruits and Vegetables 1.6.2 Grading 1.6.3 Washing 1.6.4 Peeling 1.6.5 Cutting 1.6.6 Blanching 1.6.7 Cooling 1.6.8 Filling 1.6.9 Exhausting 1.6.10 Sealing 1.6.11 Processing 1.6.12 Cooling 1.6.13 Storage 1.7 Why to Start Fruits and Vegetables Processing Business? 2. How to Start a Fruit and Vegetable Processing Business 2.1 Conduct Market Research 2.2 Create a Business Plan 2.3 Legal Requirements and Licenses 2.4 Secure a Location and Equipment 2.5 Source Raw Materials 2.6 Production Process 2.7 Branding and Marketing 2.8 Distribution 2.9 Financial Management 2.10 Continuous Improvement 3. Plant Layout Description of Fruit and Vegetable Processing Unit 3.1 Reception and Pre-processing Area 3.2 Primary Processing Area 3.3 Secondary Processing Area 3.4 Packaging and Warehousing Area 3.5 Quality Control Lab 3.6 Utility and Support Areas 3.7 Cold Chain Facilities 3.8 Layout Considerations 4. General Procedures for Fruit and Vegetable Preservation 4.1 Fresh Storage 4.2 Preservation by Reduction of Water Content: Drying/ Dehydration and Concentration 4.2.1 Water and Water Activity (aw) in Foods 4.3 Preservation by Drying /Dehydration 4.4 Heat and Mass Transfer 4.5 Drying Techniques 4.6 Fruit and Vegetable Natural Drying-Sun and Solar Drying 4.7 Use of Preservatives 4.8 Osmotic Dehydration 4.9 Sun Drying 4.10 Shade Drying 4.11 Identification of Suitable Designs of Solar Dryers for Different Applications 4.12 Construction of Solar Dryers 4.13 Construction Methods and Materials 4.14 Technical Criteria 4.14.1 Socio-Economic Criteria 4.14.2 Summary 4.14.3 Sun/Solar Drying Tray 4.14.4 Dryers 4.14.5 Preservation by Concentration 4.14.6 Aspects of Preservation by Concentration 4.14.7 Reduced Weight and Volume by Concentration 4.14.8 Methods of Concentration 4.14.9 Changes from Concentration 4.14.10 Chemical Preservation 4.14.11 Other Acidulants 4.14.12 Commonly Used Lipophilic Acid Food Preservatives 4.14.13 Gaseous Chemical Food Preservatives 4.14.14 chlorine 4.14.15 General Rules for Chemical Preservation 4.14.16 Factors which Determine/Influence the Action of Chemical Food Preservatives 4.14.17 Miscellaneous Factors 4.15 Preservation of Vegetables by Acidification 4.15.1 Natural Acidification 4.15.2 Factors Influencing the Texture of Fermented Vegetables 4.15.3 Preservation with Sugar 4.15.4 Heat Preservation / Heat Processing 4.15.5 Determining Heat Treatment/Thermal Processing Steps 4.15.6 Technological Principles of Pasteurization 4.15.7 Thermopenetration 4.16 Food Irradiation 4.16.1 Introduction 4.16.2 Applications 5. Chemical Preservation of Foods 5.1 What are Food Additives? 5.1.1 Importance of Chemical Additives 5.1.2 Legitimate Uses in Food Processing 5.1.3 Undesirable Uses of Additives 5.1.4 Safety of Food Additive 5.2 Functional Chemical Additive Applications 5.2.1 Historical Significance 5.2.2 Specific Uses of Chemical Additives 5.2.3 Additives Permitted and Prohibited in the United States 5.3 Chemical Preservatives 5.3.1 Microbial Antagonists 5.3.2 Antibiotics 5.4 Other Chemical Additives 5.4.1 Artificial flavoring 5.4.2 Artificial Coloring 5.4.3 Other Agents 5.5 Chemical Additives and the Future 6. Food Preservation by Fermentation 6.1 Life with Microorganisms 6.2 Fermentation of Carbohydrates 6.2.1 Industrially Important Organisms in Food Preservation 6.2.2 Order of Fermentation 6.2.3 Types of Fermentations of Sugar 6.2.4 Fermentation Controls 6.3 Wine 6.3.1 Preservation 6.3.2 Sterilization Filtration 6.4 Beer 6.4.1 Cold Pasteurization 6.5 Vinegar Fermentation 6.5.1 Principles of Vinegar Fermentation 6.6 Vinegar Making 6.6.1 Preparation of Yeast Starter 6.6.2 Alcoholic Fermentation 6.6.3 Acetic Fermentation 6.7 Cheese 6.7.1 Kinds of Cheese 6.8

Hazard Analysis in Cheeses 6.8.1 Mycotoxins and Cheese 7. Canning Fruits 7.1 Apple 7.2 Apricot 7.3 Banana 7.4 Black berries 7.5 Cherries 7.6 Fig 7.7 Grape 7.8 Grape Fruit 7.9 Greengage 7.10 Guava 7.11 Jack-Fruit 7.12 Litchi 7.13 Loquat 7.14 Mango 7.15 Orange 7.16 Papaya 7.17 Peach 7.18 Pear 7.19 Pineapple 7.20 Plum 7.21 Berry Fruits 8. Syrups and Brines for Canning 8.1 Sugar Syrups 8.1.1 Preparation 8.1.2 Testing Syrup Strength 8.1.3 Temperature Corrections 8.1.4 Syrup Calculations 8.2 Brines 9. Fruit Beverages 9.1 Squashes and Cordials 9.1.1 Orange Squash 9.1.2 Grape Fruit Squash 9.1.3 Lemon Squash 9.1.4 Lime Squash 9.1.5 Lime Juice Cordial 9.1.6 Citrus Fruit Barley Waters 9.1.7 Jack Fruit Nectar 9.1.8 Jaman Squash or Syrup 9.1.9 Mango Squash 9.1.10 Passion Fruit Squash 9.1.11 Peach Squash 9.1.12 Phalsa Squash 9.1.13 Pineapple Squash 9.1.14 Plum Squash 9.1.15 Water Melon Squash 9.1.16 Other Fruit Squashes 9.2 Juices 9.2.1 Apple Juice 9.2.2 Cashew Apple Juice 9.2.3 Citrus Juices 9.2.4 Grape juice 9.2.5 Pineapple Juice 9.2.6 Pomegranate Juice 9.3 Syrups 9.4 Carbonated Beverages 9.5 Fruit Juice Concentrates 9.5.1 Tamarind Juice Concentrate 10. Fermented Beverages 10.1 Grape Wine 10.2 Fermentation 10.3 Packing 10.4 Champagne 10.5 Port 10.6 Muscat 10.7 Tokay 10.8 Sherry 10.9 Cider 10.10 Perry 10.11 Orange Wine 10.12 Berry Wines 11. Jams, Jellies and Marmalades 11.1 Jams 11.1.1 Fresh Fruits 11.1.2 Frozen Fruits 11.1.3 Fruits Preserved by Heat Treatment 11.1.4 Sulphitation for Storing 11.1.5 Preparing the fruit for Jam-making 11.1.6 Addition of Sugar 11.1.7 Addition of Acid, Colour and Flavour 11.1.8 Boiling under Vacuum 11.1.9 End Point 11.1.10 Storage 11.2 Controlled Manufacture 11.2.1 Soluble Solids 11.2.2 Total Soluble Solids 11.2.3 Insoluble Solids 11.3 Jellies 11.3.1 Fruits for Jelly 11.3.2 Selection of Fruits 11.3.3 Preparation of Fruits 11.3.4 Extraction of Pectin 11.3.5 Straining and Clarification 11.3.6 Pectin requirement 11.4 Theory of Jelly Formation 11.4.1 Fibril Theory 11.4.2 Spencer's Theory 11.4.3 Olsen's Theory 11.4.4 Hinton's Theory 11.4.5 Strength of Pectin Jellies 11.5 Test 11.5.1 Temperature of Gelation 11.5.2 Gelation Time 11.5.3 Role of Acid 11.5.4 Controlling the pH of Jellies 11.5.5 Role of Salts 11.5.6 Role of Sugar 11.5.7 Quantity of Sugar to be Added 11.5.8 Kinds of Sugar Used 11.5.9 How to Add Sugar 11.5.10 Inversion of Sugars 11.5.11 Cooking of Jelly 11.5.12 Determination by Thermometer 11.5.13 Determination by Sheetting or Ladle Test 11.5.14 Determination by Weighing 11.5.15 Foaming 11.5.16 Packing 11.5.17 Sealing and Sterilization 11.5.18 Failure of Jellies to Set 11.5.19 Cloudy or Foggy Jellies 11.5.20 Formation of Crystals 11.5.21 Syneresis or 'Weeping' 11.6 Some Typical Jams and Jellies 11.6.1 Jams 11.6.2 Jellies 11.6.3 Jam-Like Products 11.7 Marmalades 11.7.1 Jelly Marmalades 11.7.2 Selection of Fruit 11.7.3 Preparing the Fruit 11.7.4 Boiling for Extraction of Pectin 11.7.5 Cleaning of Pectin Extract 11.7.6 Preparation of Shreds of Peel 11.7.7 Flavouring 11.7.8 Canning and Sterilization 11.7.9 Darkening 11.8 Jam Marmalade 12. Tomato Products 12.1 Tomato Juice 12.1.1 Washing and Trimming 12.1.2 Crushing 12.1.3 Pulping 12.1.4 Extraction of Juice 12.1.5 Total Solids 12.1.6 Common Salt and Sugar 12.1.7 Packing 12.1.8 Analysis of Juice 12.2 Tomato Puree 12.2.1 Preparation 12.2.2 Pulp Concentration 12.2.3 Pulp Consistency 12.2.4 The End Point 12.2.5 Packing 12.3 Tomato Paste 12.4 Tomato Cocktail 12.4.1 Quality of Ingredients 12.4.2 Pasteurization 12.5 Tomato Ketchup 12.5.1 Raw Material 12.5.2 Juice Extraction 12.5.3 Juice Standardisation 12.5.4 Recipes 12.5.5 Addition of Ingredients 12.5.6 Thickening Agents 12.5.7 Cooking and Concentration 12.5.8 Bottling 12.5.9 Pasteurization 12.6 Chilli Sauce 12.6.1 Preparation 12.7 Tomato Sauce 12.8 Tomato Soup 12.8.1 Preparation 12.8.2 Sterilization 12.9 Microbiology 13. Chutneys, Sauces and Pickles 13.1 Chutneys 13.1.1 Cooking Process 13.1.2 Bottling 13.1.3 Equipment 13.1.4 Recipes 13.1.5 Apple Chutney 13.1.6 Apricot Chutney 13.1.7 Bamboo Chutney 13.1.8 Mango Chutney 13.1.9 Sweet Mango Chutney 13.1.10 Sliced Mango Chutney 13.1.11 Peach Chutney 13.1.12 Plum Chutney 13.1.13 Tomato Chutney 13.2 Thin Sauces 13.2.1 Soya Sauce 13.2.2 Worcestershire Sauce 13.2.3 Mushroom Ketchup (Sauce) 13.2.4 Walnut Ketchup (Sauce) 13.3 Thick Sauces 13.3.1 Apple Sauce 13.3.2 Tomato Sauce 13.3.3 Fruit Sauces 13.4 Soups and Soup Mixes 13.5 Pickles 13.5.1 Problems in Pickling 13.5.2 Action of Preservatives 13.5.3 Raw Materials 13.5.4 Colouring and Hardening Agents 13.5.5 Equipment 13.5.6 Weighing Scales 13.5.7 Measures for Liquids 13.5.8 Cooking Utensils 13.6 Pickling Process 13.6.1 Dry Salting 13.7 Fermentation in Brine 13.7.1 Brine Preparation

13.7.2 Keeping Quality 13.7.3 Packing Methods 13.7.4 Causes of Spoilage 13.8 Various Pickles  
 13.8.1 Apple Pickle 13.8.2 Cabbage Pickle 13.8.3 Beetroot Pickle 13.8.4 Cucumber Pickle  
 13.8.5 With Vinegar 13.8.6 Sweet Variety 13.8.7 Jack Fruit Pickle 13.8.8 Onion Pickle 13.8.9  
 Walnut Pickle 13.9 Oil Pickles 13.9.1 Bamboo Pickle 13.9.2 Cauliflower Pickle 13.9.3 Jack Fruit  
 Pickle 13.9.4 Lime Pickle (Lime Chilli Pickle) 13.9.5 Mango Pickle 13.9.6 Turnip Pickle 14.  
 Vegetables Preparation for Processing 14.1 Basic Steps in Preprocessing 14.2 Preprocessing  
 of Tomatoes 14.2.1 Field Processing 14.2.2 Washing in Lye 14.2.3 Peeling 14.3 Blanching  
 14.3.1 Testing for the Adequacy of Blanching 14.4 Irradiation of Vegetables 14.5 Removing  
 Potatoes from Storage to Processing 14.6 Peeling 14.6.1 Dry - Caustic Peeling 14.6.2 Flame  
 Peeling 14.6.3 Peeling Sweet Potatoes 14.6.4 High Pressure Steam Peeling 15. Vegetables  
 Juices, Sauces and Soups 15.1 Vegetable Juices 15.1.1 General Preparation Procedure 15.2  
 Rhubarb Juices and Beverages 15.3 Juices from Sauerkraut and Other Fermented Vegetables  
 15.4 Low- Acid Vegetable Juices 15.4.1 Tomato Juice 15.5 Tomato Juice Blends 15.6  
 Concentrated Tomato Juice 15.7 Composition, Color, and Texture of Tomato Juice Products  
 15.8 Vegetable Sauces 15.8.1 Canned Sauces 15.9 Dried Sauce Mixes 15.10 Vegetables in  
 Soups 15.10.1 Stock 15.11 Canned Soups Containing Vegetable Pulps, Emulsions, and  
 Powders 15.11.1 Canned Soups Containing Cut Vegetables 15.11.2 Processing Equipment and  
 Heat Processes for Canned Soups 15.11.3 Dry Soup Mixtures 15.11.4 Frozen Soups 16. BIS  
 Standards 17. Factory Layout and Process Flow Chart & Diagram 18. Photographs of Plant and  
 Machinery with Suppliers Contact Details • Tunnel Dryer • Vegetable Fruits Washing Machine •  
 Pulveriser Machine • Fruit and Vegetable Sorting Grading Line • Fruit Destoner • Can  
 Seamer/Filler Machine • Fruit Core Removing Machine • Three Tier Conveyor • Cooling  
 Conveyor • The Fruit Hammer Crusher • Juice Processing Plant • Fruits and Vegetables Food  
 Dryer Dehydrator Machine • Vegetable Cutter • Polisher • Fermentation Tank • Pulper Cum  
 Finisher • Tray Dryer • Pulp Filling Machine • Peeling Machine • Vegetable Blanching Machine  
 • Juice Sterilizer Machine, Pastueriser • Fruit and Vegetable Juice Tanks • Canning Processing  
 Plant • Tomato Processing Plant • Pickle Mixing Machine • Pickle Filling Machine • Jam  
 Preparation Lines • Wine Making Machine

## 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 10:15:19 +0000