

**How to Start**

**Fruits and Vegetables  
Processing Industry**

# Introduction

**Fruits and vegetables, which are among the perishable commodities, important ingredients in the human dietaries. Due to their high nutritive value they make significant nutritional contribution to human well-being. They are the cheaper and better source, the protective foods. If they can be supplied in fresh or preserved form throughout the year for human consumption, the national picture will improve greatly.**



**The vast production base offers India tremendous opportunities for export. During 2014-15, India exported fruits and vegetables worth Rs. 7474.14 crores which comprised of fruits worth Rs. 2771.32 crores and vegetables worth Rs. 4702.78 crores. Mangoes, Walnuts, Grapes, Bananas, Pomegranates account for larger portion of fruits exported from the country while Onions, Okra, Bitter Gourd, Green Chilles, Mushrooms and Potatoes contribute largely to the vegetable export basket. The major destinations for Indian fruits and vegetables are UAE, Bangladesh, Malaysia, UK, Netherland, Pakistan, Saudi Arabia, Sri Lanka and Nepal.**

**In developing countries agriculture is the mainstay of the economy. As such, it should be no surprise that agricultural industries and related activities can account for a considerable proportion of their output. Of the various types of activities that can be termed as agriculturally based, fruit and vegetable processing are among the most important. Therefore, fruit and vegetable processing has been engaging the attention of planners and policy makers as it can contribute to the economic development of rural population.**



**The utilization of resources both material and human is one of the ways of improving the economic status of family.**

**Fruit & vegetable processing is driven by growing consumer demand for healthy and fresh products that are easily available and require minimal preparation time. Processing of fruits & vegetables increases their shelf-life.**



**Since they are traded on a large scale, processing ensures that market demand of fruits & vegetables with standard quality is met.**

**Some of the fundamentals of the book are preservation of pineapple, mango and papaya chunks by hurdle technology, effect of boiling on beta-carotene content of forest green leafy vegetables consumed by tribals of south India, process development for production of pure apple juice in natural colour of choice, physical refining of rice bran and soybean oils, anti nutrients and protein digestibility of fababeans**

and ricebean as affected by soaking, dehulling and germination, quality changes in banana (musa acuminata) wines on adding pectolase and passion fruit, essential oil composition of fresh and osmotically dehydrated galgal peels, development of cold grinding process, packaging and storage of cumin powder, bakery products and confections, etc.

This book deals completely on the basic principles & methodology of fruits, vegetables, corn & oilseed processing & its preservation. This will be very resourceful to readers especially to technocrats, engineers, upcoming entrepreneurs, scientists, food technologists etc.

# Table of Contents

**Chapter 1 : Preservation of Pineapple, Mango and Papaya Chunks by Hurdle Technology**

**Chapter 2 : Process Development for Production of Pure Apple Juice in Natural Colour of Choice**

**Chapter 3 : Anthocyanins from Indian Varieties of Grapes**

**Chapter 4 : Processing Effect on Colour and Vitamins of Green Leafy Vegetables**

**Chapter 5 : Dissipation of Alphametherin Residues in/on Brinjal and Tomato During Storage and Processing Conditions**

**Chapter 6 : Effect of Boiling on Beta-carotene Content of Forest Green Leafy Vegetables Consumed by Tribals of South India**



**Chapter 7 : Physical and Functional Properties of Mucilages from Yellow Mustard (*Sinapis alba* L.) and Different Varieties of Fenugreek (*Trigonella foenum-graecum* L.) Seeds**

**Chapter 8 : Quality Parameters of Selected Mango Cultivars**

**Chapter 9 : Effect of Stage of Apple Pomace Collection and the Treatment on the Physico-chemical and Sensory Qualities of Pomace Papad (Fruit cloth)**

**Chapter 10 : Physical Refining of Rice Bran and Soybean Oils**

**Chapter 11 : Physico-chemical Status of Major Milk Constituents and Minerals at Various Stages of Shrikhand Preparation**

**Chapter 12 : Studies on the Development of Instant 'Dahi Bhalla'-An Indian Traditional Snack Preparation**

**Chapter 13 : Quality Characteristics of Freeze Dried Indian White Squid (*Loligo duvauceli* Orbigny)**

**Chapter 14 : Antinutrients and Protein Digestibility of Fababean and Ricebean as Affected by Soaking, Dehulling and Germination**

**Chapter 15 : Nutritional Evaluation of Sorghum Flour on Supplementation with Whey Proteins**

**Chapter 16 : Nutritional Evaluation of Soy Fortified Biscuits**

**Chapter 17 : Functional Properties of Defatted Cashew Kernel Flour**

**Chapter 18 : Glucoamylase Production by Aspergillus Niger in Solid State Fermentation with Paddy Husk as Support**

**Chapter 19 : Effect of Storage on Physico-chemical & Nutritional Characteristics of Carrot-Beetroot and Carrot-Black Carrot Juice**

**Chapter 20 : Osmotic Dehydration Characteristics of Button Mushrooms**

**Chapter 21 : Quality Changes in Banana (*Musa acuminata*) Wines on Adding Pectolase and Passion Fruit**

**Chapter 22 : Concentration of Clarified Orange Juice by Reverse Osmosis**

**Chapter 23 : Studies on the Volatiles of Cardamom (*Elleteria cardamomum*)**

**Chapter 24 : Effect of Level of Juice Extraction on Physico-chemical Characteristics and Bitterness of Heat Processed Kinnow Juice**

**Chapter 25 : Nutritive Value of Malted Flours of Finger Millet Genotypes and Their Use in the Preparation of Burfi**

**Chapter 26 : Effect of Storage on Rice Yield Recovery**

**Chapter 27 : Studies on the Processing and Evaluation of Instant Idli Mixes**

**Chapter 28 : Vermicelli Noodles and Their Quality Assessment**

**Chapter 29 : Composition and Functional Properties**

**Chapter 30 : Biscuit Making Quality of Advance Lines of Wheat in India**

**Chapter 31 : Effect of Incorporation of Defatted Soyflour on the Quality of Sweet Biscuits**

**Chapter 32 : Effect of Supplementation of Processed Maize Germ Cake on Nutritional Quality of Maize**

**Chapter 33 : Studies on the Stability of Some Edible Oils and Their Blends During Storage**

**Chapter 34 : Reversed-Phase HPLC of Methyl Esters of Fatty Acids in Soybean Oil**

**Chapter 35 : Functional Properties and Nutritive Composition of Maize (zea mays) as Affected by Heat Treatments**

**Chapter 36 : Effect of Non-enzymatic Browning on Quality of Lime Juice**

**Chapter 37 : Essential Oil Composition of Fresh and Osmotically Dehydrated Galgal Peels**

**Chapter 38 : Solar Drying of Coriander and Methi Leaves**

**Chapte 39 : Supercritical Co2 Extraction of Sesame Oil from Raw Seeds**

**Chapter 40 : Studies on Juice Extraction of Aonla (*Emblica officinalis* Gaertn.) cv. 'Chakaiya'**

**Chapter 41 : Anti-nutritional and Flatulence Factors at Various Stages of Vegetative Growth of Fenugreek (*Trigonella Foenum Graecum* L.) Leaves**

**Chapter 42 : Processing and Quality Evaluation of Banana (*Musa acuminata*) Cheese**

**Chapter 43 : Effect of Primary Processing on Microbial Load of Cauliflower and Fenugreek**



**Chapter 44 Utilisation of Peel in Plantain Wine Production**

**Chapter 45 : Optimization of Processing Conditions for Cottage Scale Production of Hurum**

**Chapter 46 : Sugarcane Juice Concentrate Preparation, Preservation and Storage**

**Chapter 47 : Nutritive Value of Dehydrated Green Leafy Vegetable Powders**

**Chapter 48 : Optimization of Process Parameters for Absorption of Milk by Makhana**

**Chapter 49 : Development of Nutritious Supplementary Biscuits from Greengram Dhal**

**Chapter 50 : Vitamin A Fortification of Cottage Cheese**

**Chapter 51 : Biochemical Composition of Cashew (*Anacardium occidentale* L.) Kernel Testa**

**Chapter 52 : Microbiological Quality of Milk, Vegetables and Fruit Juices**

**Chapter 53 : Bacteriological Examination of Pasteurized Milk and Milk Products, Sold in Harare, Zimbabwe**

**Chapter 54 : Effect of Different Thermal Treatments on Vitamin C and Microbial Sterility of Canned Drumstick (*Moringa oleifera*)**

**Chapter 55 : Solar Tunnel Drying of Red Chillis (*Capsicum annum* L.)**

**Chapter 56 : Studies on Nitrogen Extractability of Defatted Sunflower Meal**

**Chapter 57 : Development of Cold Grinding Process, Packaging and Storage of Cumin Powder**

**Chapter 58 : Determination of Residual Hexane and Microbiological Status in De-oiled Soybean Meal**

**Chapter 59 : Oilgosaccharide Levels of Processed Redgram (*Cajanus cajan* L.)**

**Chapter 60 : Impact of Drying on Quality of Betel Leaf (*Piper betle* L.)**

**Chapter 61 : Chemical Composition, Anti-nutritional Factors and Shelf-life of Oyster Mushroom (*Pleurotus ostreatus*)**

**Chapter 62 : Effect of Milk Protein Modification on Physico-chemical Changes During Ripening of Cheddar Cheese**

**Chapter 63 : Simple Tests for Differentiating Raw-Old and New and Steamed Rice in a Mixture**

**Chapter 64 : Effect of Chhana and Paneer Whey on the Manufacturing Time and Loaf Volume of Bread**

**Chapter 65 : Glucose Lowering Effects of Pre-cooked Instant Preparations Containing Alfalfa Seeds in Non-insulin Dependent Diabetic Subjects**

**Chapter 66 : Modelling of Visual Shelf-life of Pearl Millet (*Pennisetum glaucum*) Dough (Fura)**

**Chapter 67 : Effect of Blanching on Pickled Bitter Gourd (Momordica charantia)**

**Chapter 68 : Testing of A Convection Type Cylindrical Dryer for Production of Instant Soy dosa Mix**

**Chapter 69 : Antinutrient Profile and Chemical Composition of Custard Powder Produced in Nigeria**

**Chapter 70 : Evaluation of Performance of Shea Fat as a Shortening in Breading**

**Chapter 71 : Microbiological and Biochemical Changes During Fermentation of Kanji**

**Chapter 72 : Bakery Products and Confections Chapter 73 : Adverse Reactions to Food Additives and Colours**

**Chapter 74 : Inhibitory Action of Cinnamon on Listeria Monocytogenes in Meat and Cheese**

**Chapter 75 : Competitive Growth of Aeromonas Hydrophila in Meat**

**Chapter 76 Preliminary Physico-chemical and Microbial Evaluation of an Exudate from a Neem Tree (Azadirachta Indica Juss.) in Mysore, South India**



**Niir Project Consultancy Services (NPCS)**  
**can provide Process Technology Book on**  
**Fruits, Vegetables, Corn and Oilseeds**  
**Processing**

**See more**

<http://goo.gl/gFNPDe>

<http://goo.gl/l5n3xG>

<http://goo.gl/aaoiKd>

<http://goo.gl/Vikm7s>

*Visit us at*

[www.entrepreneurindia.co](http://www.entrepreneurindia.co)



***Take a look at NIIR PROJECT CONSULTANCY  
SERVICES on #StreetView***

**<https://goo.gl/VstWkd>**

*Locate us on  
Google Maps*

<https://goo.gl/maps/BKkUtq9gevT2>



# ***NIIR PROJECT CONSULTANCY SERVICES***

An ISO 9001:2008 Company



# Who are we?

- *One of the leading reliable names in industrial world for providing the most comprehensive technical consulting services*
- *We adopt a systematic approach to provide the strong fundamental support needed for the effective delivery of services to our Clients' in India & abroad*



# What do we offer?

- *Project Identification*
- *Detailed Project Reports/Pre-feasibility Reports*
- *Business Plan*
- *Industry Trends*
- *Market Research Reports*
- *Technology Books and Directory*
- *Databases on CD-ROM*
- *Laboratory Testing Services*
- *Turnkey Project Consultancy/Solutions*
- *Entrepreneur India (An Industrial Monthly Journal)*



# How are we different ?

- *We have two decades long experience in project consultancy and market research field*
- *We empower our customers with the prerequisite know-how to take sound business decisions*
- *We help catalyze business growth by providing distinctive and profound market analysis*
- *We serve a wide array of customers , from individual entrepreneurs to Corporations and Foreign Investors*
- *We use authentic & reliable sources to ensure business precision*



# Our Approach

Requirement collection

Thorough analysis of the project

Economic feasibility study of the Project

Market potential survey/research

Report Compilation



# Who do we serve?

- *Public-sector Companies*
- *Corporates*
- *Government Undertakings*
- *Individual Entrepreneurs*
- *NRI's*
- *Foreign Investors*
- *Non-profit Organizations, NBFC's*
- *Educational Institutions*
- *Embassies & Consulates*
- *Consultancies*
- *Industry / trade associations*

# Sectors We Cover

- *Ayurvedic And Herbal Medicines, Herbal Cosmetics*
- *Alcoholic And Non Alcoholic Beverages, Drinks*
- *Adhesives, Industrial Adhesive, Sealants, Glues, Gum & Resin*
- *Activated Carbon & Activated Charcoal*
- *Aluminium And Aluminium Extrusion Profiles & Sections,*
- *Bio-fertilizers And Biotechnology*
- *Breakfast Snacks And Cereal Food*
- *Bicycle Tyres & Tubes, Bicycle Parts, Bicycle Assembling*

## Sectors We Cover *Cont...*

- *Bamboo And Cane Based Projects*
- *Building Materials And Construction Projects*
- *Biodegradable & Bioplastic Based Projects*
- *Chemicals (Organic And Inorganic)*
- *Confectionery, Bakery/Baking And Other Food*
- *Cereal Processing*
- *Coconut And Coconut Based Products*
- *Cold Storage For Fruits & Vegetables*
- *Coal & Coal Byproduct*



- *Copper & Copper Based Projects*
- *Dairy/Milk Processing*
- *Disinfectants, Pesticides, Insecticides, Mosquito Repellents,*
- *Electrical, Electronic And Computer based Projects*
- *Essential Oils, Oils & Fats And Allied*
- *Engineering Goods*
- *Fibre Glass & Float Glass*
- *Fast Moving Consumer Goods*
- *Food, Bakery, Agro Processing*



- *Fruits & Vegetables Processing*
- *Ferro Alloys Based Projects*
- *Fertilizers & Biofertilizers*
- *Ginger & Ginger Based Projects*
- *Herbs And Medicinal Cultivation And Jatropha (Biofuel)*
- *Hotel & Hospitability Projects*
- *Hospital Based Projects*
- *Herbal Based Projects*
- *Inks, Stationery And Export Industries*

## Sectors We Cover *Cont...*

- *Infrastructure Projects*
- *Jute & Jute Based Products*
- *Leather And Leather Based Projects*
- *Leisure & Entertainment Based Projects*
- *Livestock Farming Of Birds & Animals*
- *Minerals And Minerals*
- *Maize Processing(Wet Milling) & Maize Based Projects*
- *Medical Plastics, Disposables Plastic Syringe, Blood Bags*
- *Organic Farming, Neem Products Etc.*

# Sectors We Cover *Cont...*

- *Paints, Pigments, Varnish & Lacquer*
- *Paper And Paper Board, Paper Recycling Projects*
- *Printing Inks*
- *Packaging Based Projects*
- *Perfumes, Cosmetics And Flavours*
- *Power Generation Based Projects & Renewable Energy Based Projects*
- *Pharmaceuticals And Drugs*
- *Plantations, Farming And Cultivations*
- *Plastic Film, Plastic Waste And Plastic Compounds*
- *Plastic, PVC, PET, HDPE, LDPE Etc.*

## Sectors We Cover *Cont...*

- *Potato And Potato Based Projects*
- *Printing And Packaging*
- *Real Estate, Leisure And Hospitality*
- *Rubber And Rubber Products*
- *Soaps And Detergents*
- *Stationary Products*
- *Spices And Snacks Food*
- *Steel & Steel Products*
- *Textile Auxiliary And Chemicals*

## Sectors We Cover *Cont...*

- *Township & Residential Complex*
- *Textiles And Readymade Garments*
- *Waste Management & Recycling*
- *Wood & Wood Products*
- *Water Industry(Packaged Drinking Water & Mineral Water)*
- *Wire & Cable*

## **Niir Project Consultancy Services**

**106-E, Kamla Nagar, New Delhi-110007, India.**

**Email: [npcs.ei@gmail.com](mailto:npcs.ei@gmail.com) , [info@entrepreneurindia.co](mailto:info@entrepreneurindia.co)**

**Tel: +91-11-23843955, 23845654, 23845886**

**Mobile: +91-9811043595**

**Fax: +91-11-23841561**

**Website :**

**[www.niir.org](http://www.niir.org)**

**[www.entrepreneurindia.co](http://www.entrepreneurindia.co)**

**Take a look at NIIR PROJECT CONSULTANCY SERVICES on #StreetView**

**<https://goo.gl/VstWkd>**

**[www.niir.org](http://www.niir.org)**

**[www.entrepreneurindia.co](http://www.entrepreneurindia.co)**



# Follow Us



➤ <https://www.linkedin.com/company/niir-project-consultancy-services>



➤ <https://www.facebook.com/NIIR.ORG>



➤ <https://www.youtube.com/user/NIIRproject>



➤ <https://plus.google.com/+EntrepreneurIndiaNewDelhi>



➤ [https://twitter.com/npcs\\_in](https://twitter.com/npcs_in)



➤ <https://www.pinterest.com/npcsindia/>

[www.niir.org](http://www.niir.org)

[www.entrepreneurindia.co](http://www.entrepreneurindia.co)





# THANK YOU!!!

For more information, visit us at:

[www.entrepreneurindia.co](http://www.entrepreneurindia.co)

