

# **The Complete Book on Ginger Cultivation and Manufacture of Value Added Ginger Products (Ginger Storage, Ginger Oil, Ginger Powder, Ginger Paste, Ginger Beer, Instant Ginger Powder Drink and Dry Ginger from Green Ginger)**

**Author:** NPCS Board of Consultants & Engineers

**Format:** Paperback

**ISBN:** 9789381039854

**Code:** NI308

**Pages:** 352

**Price:** Rs. 1,575.00 **US\$** 150.00

**Publisher:** NIIR PROJECT CONSULTANCY SERVICES

Usually ships within **5** days

Ginger is the common name for *Zingiber officinale*, which was originally cultivated in China and now equally spread around the world. Ginger is a herb but is often known as a spice, with a strong distinct flavor that can increase the production of saliva. The part that is used as spice on the plant itself is the rhizomes or ginger root. This ginger root is traditionally used with sweet foods in Western cuisine being included in popular recipes such as ginger ale, gingerbread, ginger biscuits and ginger cake. It is also used in many countries as a medicinal ingredient which many believe in. Historically, ginger has a long tradition of being very effective in alleviating symptoms of gastrointestinal distress. In herbal medicine, ginger is regarded as an excellent carminative and intestinal spasmolytic. Modern scientific research has revealed that ginger possesses numerous therapeutic properties including antioxidant effects, an ability to inhibit the formation of inflammatory compounds, and direct anti-inflammatory effects.

India is the leading producer of ginger oil and dominates the ginger oil market with almost half shares out of total market. China is also known for ginger production and trade of ginger oil. Asia Pacific mainly exports ginger oil to North America and European markets.

Increasing number of health conscious consumers, and their demands for natural oils and extracts based products is the major factor driving growth for essential oils and in turn ginger oil market. Ginger is majorly used in spices and thus ginger oils and oleoresins are preferred to prepared dried spices as flavoring in food industry, because they are more stable, contamination free, cleaner and can be easily standardized by blending. Thus the growth of food industry and spices demand are another factors driving growth of ginger oil market. The growth of natural personal care products industry is another growth driver for ginger oil market.

The major content of the book are Ginger Cultivation, Farm and Forestry Production for Ginger, Diseases & Pest Management in Ginger, Medicinal Values of Ginger, Active Ingredients of Ginger, Pharmacological Activity of Ginger, Ginger Storage, Ginger Processing, Ginger Oleoresin, Ginger Oil, Ginger Beer, Ginger Powder, Ginger Paste, Instant Ginger Powder Drink, Ginger Candy, Dry Ginger from Green Ginger, Extraction of Ginger Oleoresin from Ginger-Root Using Co<sub>2</sub>, Production of Ginger Rhizome by Shoot-Tip Culture, Extraction of Essential Oils from Ginger Rhizome Using Steam Distillation Method, Packaging and

Labelling BIS Specifications, Good Manufacturing Practices, Sample Plant Layouts, Photographs of Machinery with Suppliers Contact Details.

This book will be a mile stone for its readers who are new to this sector, will also find useful for professionals, entrepreneurs, those studying and researching in this important area.

## Contents

### 1. INTRODUCTION

History and Origin of Ginger

Processing of Ginger

Peeling

Drying

Storage

Bleached Ginger

Transplanting Technology for Reduction of Seed

Cost

Technology

Manuring

Irrigation

Inter Cultivation

Inter Cropping and Crop Rotation

Uses of Ginger

Best Ways to Use Ginger

Bioactive Components of Ginger

Metabolism of Ginger

Properties

Applications of Ginger

Ginger Health Benefits

1. Stroke and Heart Disease

2. Indigestion and Nausea

3. Malabsorption

4. Compromised Immunity and Respiratory

Function

5. Bacterial Infections

Healing Properties

Cosmetic Uses of Ginger

Nutritional Value of Ginger

Nutrient Profile for Ginger

### 2. GINGER CULTIVATION

Climate and Soil

Soil for Ginger Farming

Varieties

Planting Season

Preparation of Land

Manures and Fertilisers

Mulching

Crop Nutrition

Nitrogen

Potassium

Phosphorus

Calcium  
Earthing up  
Growth Regulators  
Harvesting and Curing  
Production Technology  
Seed Size  
Seed Rate  
Seed Treatment  
Planting  
Spacing  
Depth of Planting  
Crop Rotation  
Storage of Seed Rhizomes  
Alternate Method of Ginger Production

### 3. FARM AND FORESTRY PRODUCTION FOR GINGER

Uses and Products  
Botanical Description  
Brief Botanical Description  
Distribution  
Environmental Preferences and Tolerances  
Climate  
Soils  
Growth and Development  
Agroforestry and Environmental Services  
Propagation and Planting  
Cultivation  
Special Horticultural Techniques  
Advantages and Disadvantages of Growing in Polycultures  
Pests and Diseases  
Susceptibility to Pests/Pathogens  
Preventing and Treating Problem Pests and Diseases  
Disadvantages of this Crop  
Potential for Invasiveness  
Commercial Production  
Postharvest Handling and Processing

### 4. DISEASES & PEST MANAGEMENT IN GINGER

Diseases

1. Soft Rot or Paheli: *Pythium Aphanidrematum*  
Management
2. Dry Rot: *Fusarium* and *Pratylenchus* Complex  
Management
3. Leaf Spot/Blight: *Phyllosticta Zingiberi*  
Management
4. Bacterial Wilt or Prem Rog: *Ralstonia Solanacearum*  
Management

Integrated Pest and Disease Management for Ginger

### 5. MEDICINAL VALUES OF GINGER

Active Compounds in Ginger  
Anti-Inflammatory & Anti-Oxidant

Nausea  
Digestion  
Cholesterol  
Cancer  
Anti-Bacterial  
Migraines  
Drug Interactions  
Malabsorption  
Bacterial Diarrhea  
Anticarcinogenic Activities of Ginger  
Therapeutic Health Benefits of Ginger  
Ginger as Growth Promoter  
Osteoarthritis  
Use of Ginger as a Traditional Medicine  
Role of Ginger and Its Constituents in Prevention  
and Treatment of Gastrointestinal Cancer  
Gastric Cancer  
Pancreatic Cancer  
Liver Cancer  
Colorectal Cancer  
Cholangiocarcinoma  
Clinical Studies of Ginger against GI Cancer  
Ayurveda Health Benefits of Ginger  
Trikatu for Weak Digestion  
Dry Ginger is Hot and Warms the Lungs and  
Dries Cold Phlegm  
Fresh Ginger Warms the Stomach and Promotes  
Digestion and Absorption  
Fresh Ginger to Disperse Cold, and to Treat  
Colds and Coughs  
Ginger Root Contraindicated in Pitta Elevation  
Ginger Root in Ayurvedic Churnas

## 6. ACTIVE INGREDIENTS OF GINGER

Introduction  
Chemical Structure of Active Constituents  
Mechanism of Action of Ginger in Diseases  
Management

## 7. PHARMACOLOGICAL ACTIVITY OF GINGER

Introduction  
Pharmacology  
Antiemetic Effects  
Anti-Inflammatory Effects  
Antioxidant Effects  
Cardiovascular Effects  
Gastrointestinal Effects  
Antitussive Effects  
Immunomodulatory Effects  
Lipid Effects  
Weight Loss Effects  
Antiarthritic Effect  
Antimicrobial Activities  
Radio Protective Activity  
Antigenotoxic Activity

Mutagenicity

## 8. GINGER STORAGE

Types of Ginger

Composition of Ginger

Ginger Storage Process

Controlled Temperature and Humidity Storage

## 9. GINGER PROCESSING

Introduction

Forms of Ginger

Processing Dried Ginger

Making Dried Ginger

Quality Assurance of Dried Ginger

Grading

Grinding

Packaging

Storage

Ginger Oil Distillation

Advantages of Ginger Dehydration

1. Enhance Ginger's Value

2. More Cost-Effective

3. Wide Application

Hot-Air Circulation Drying Technology

Process Flow Sheet

## 10. GINGER OLEORESIN

Uses

## 11. GINGER OIL

Introduction

Solubility

Chemical Composition

Uses and Application

Packing and Marking

Manufacturing Process

Preparation of Raw Material

Cleaning

Milling

Soaking

Loading or Charging

Bleaching of Ginger

Practice of Distillation

Steam Distillation

End of Distillation

Treatment of the Volatile Oil

Treatment of the Distillation Water

Manufacturing Process Flow Diagram

Rectification of Essential Oils

Problems Relating to Steam Distillation

Environment Pollution and Effluent Treatment

## 12. GINGER BEER

Ginger Beer

Root Beer

Ancient Root Beer Heritage

Best Ginger Beers

## 13. GINGER POWDER

Introduction  
Properties  
Uses of Ginger Powder  
Manufacturing Process of Ginger Powder  
Process Flow Sheet  
14. GINGER PASTE  
Properties of Ginger Paste  
Uses of Ginger Paste  
Chemical & Physical Specification of Ginger  
Manufacturing Process  
Process Flow Diagram  
15. INSTANT GINGER POWDER DRINK  
Introduction  
Etymology  
Chemistry  
Uses  
Culinary Use  
Ginger Acts as a Useful Food Preservative  
Regional Use  
Properties  
1. Citric Acid  
2. Measurement  
3. Sodium Benzoate  
Manufacturing Process  
16. GINGER CANDY 201  
Ginger Candy  
Flow Chart of Technology/Process  
17. DRY GINGER FROM GREEN GINGER  
Introduction  
History  
Uses and Application  
Composition of Dry Ginger  
Manufacturing Process  
Process of Manufacture  
Ginger not Divested of Cork  
Ginger Clivested of Cork  
Grinding  
Progress Flow Sheet  
18. EXTRACTION OF GINGER OLEORESIN  
FROM GINGER-ROOT USING CO<sub>2</sub>  
Environmental Significance  
Equipment Descriptions  
Necessary Information and Simulation Hints  
19. PRODUCTION OF GINGER RHIZOME BY  
SHOOT-TIP CULTURE  
Introduction  
Field Study  
Effect of Tissue Cultured Rhizomes of Ginger  
20. EXTRACTION OF ESSENTIAL OILS FROM  
GINGER RHIZOME USING STEAM  
DISTILLATION METHOD  
Overview of Ginger  
Physical Properties of Ginger

Usage of Ginger  
Usual Methods of Obtaining Ginger Essential Oil  
Steam Distillation  
Problem Statement  
Separation Processes  
(i) Absorption  
(ii) Distillation  
(iii) Liquid-Liquid Extraction  
(iv) Leaching  
(v) Membrane Processing  
(vi) Crystallization  
(vii) Adsorption  
(viii) Ion Exchange  
• Purification  
• Concentration  
• Fractionation  
Extraction  
Distillation

## 21. PACKAGING AND LABELLING

Functions of Packaging

## 22. BIS SPECIFICATIONS

## 23. GOOD MANUFACTURING PRACTICES

1. Storage of Raw Materials
2. Tempering/Thawing of Frozen Materials
3. Processing

Post-Processing Handling

- i) Facility Design
- ii) Sanitation
- iii) Employees

Material Handling

4. Storage of Finished Product
5. Loading and Shipping

Management of Hygiene Aspects

Environmental Monitoring

Temperature Monitoring

Design and Facilities

- i) Principles and Concepts of GMP
- ii) Establishment: Design and Facilities

Location

Equipment

Premises and Rooms

Equipment – Design

Equipment

Facilities

Control of Operations

- i) Control of Food Hazards
- ii) Key Aspects of Hygiene Control Systems
- iii) Incoming Raw Material Requirements
- iv) Packaging
- v) Water
- vi) Management and Supervision
- vii) Documentation and Records
- viii) Recall Procedures

Establishment: Maintenance and Sanitation

- i) Maintenance and Cleaning
- ii) Cleaning Procedures and Methods
- iii) Pest Control Systems
- iv) Waste Management
- v) Monitoring Effectiveness
- vi) Establishment : Personal Hygiene
- vii) Transportation
- viii) Product Information and Consumer Awareness
- ix) Training

#### 24. SAMPLE PLANT LAYOUTS

Agro Processing Workflow

#### 25. PHOTOGRAPHS OF MACHINERY WITH SUPPLIERS CONTACT DETAILS

Ginger Paste Making Machine

Ginger Slicer Machine

Ginger Washing and Peeling Machine

Paste Filling Machine

Steam Jacketted Vessel

Ribbon Blendor

Pulverizer

Bucket Elevator

Powder Dryer Machine

Boiler

Oil Storage Tank

Pneumatic Conveying System

Material Handling Conveyors

Air Compressor

R.O. Plant

Distillation Units

Fruit Pulper

Liquid Filling Machine

Drum Type Blancher

Fruit Mill

Spray Machine

Weighing Machine

Packaging Machine

Ginger Oil Extraction Machine

Ginger Slicer

Pollution Control Equipment

Reverse Osmosis System

Pump

Hammer Mill

Redler Conveyors

Oil Filter Machine

Blending Tanks

Sealing Machine

Carton Packaging Machine

Pouch Packaging 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.

---

**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)

Tue, 19 Mar 2019 22:54:38 +0530