Handbook on Drying, Milling and Production of Cereal Foods (Wheat, Rice, Corn, Oat, Barley and Sorghum Processing Technology)2nd Revised Edition

Author: NIIR Board of Consultants & Engineers
Format: Paperback
ISBN: 9788178331720
Code: NI171
Pages: 472
Price: Rs. 1,295.00 **US$** 34.95
Publisher: Asia Pacific Business Press Inc.
Usually ships within **5** days

Cereals, or grains, are members of the grass family cultivated primarily for their starchy seeds (technically, dry fruits).Cereal grains are grown in greater quantities and provide more food energy worldwide than any other type of crop; they are therefore staple crops. Oats, barley, and some food products made from cereal grains. They are used for both human and animal food and as an industrial raw material. India produces cereals like wheat, rice, barley (jau), buckwheat, oats, corn (maize), rye, jowar (sorghum), pearl millet (bajra), millet (ragi), Sorghum, Triticale, etc.

India is the world's second largest producer of Rice, Wheat and other cereals. The huge demand for cereals in the global market is creating an excellent environment for the export of Indian cereal products. India is not only the largest producer of cereal as well as largest exporter of cereal products in the world. India have been offering incredible opportunities as they have an abundant amount of raw materials and a wide availability of cheap labor.

The book provides comprehensive coverage of the Drying, Milling and information regarding production method of Cereal Foods .It also covers Plant Layout, Process Flow Sheets and photographs of plant & Machinery with supplier’s contact details.

Some of the fundamentals of the book are origin of wheat classification of wheat, endeavors to find industrial uses for wheat, criteria of wheat quality, botanical criteria of quality, milling principles, extraction rate and its effect on flour composition, grain structure as affecting grinding, definition of flour extraction stone milling: yields of products, roller milling: flour extraction rates, rice production and utilization, origin of rice, comparison of rice with other cereal grains, composition of rice and cereal, breeding rice varieties with specific, industrial uses for rice and rice by products, caryopsis and composition of rice, gross structure of the rice caryopsis and its milling fractions etc.

This book is essential for those who are interested in cereal areas can find the complete information from manufacture to final uses of Cereal Foods. The present time is an era of information, one should know about what is happening in the world to be able to compete effectively. It will be very informative and useful to consultants, new entrepreneurs, startups, technocrats, research scholars, libraries and existing units.

Contents

1. Wheat

Origin of Wheat
Classification of Wheat
Moisture Consideration
Comparison of Nutrient Values
The Concept of Wheat Quality
Feed Uses For Wheat
Endeavors to Find Industrial Uses for Wheat
Criteria of Wheat Quality
Botanical Criteria of Quality
Species
Varieties
Physical Criteria of Quality
Weight Per Unit Volume
Kernel Weight
Kernel Size and Shape
Kernel Hardness
Vitreousness
Color
Damaged Kernels
Impurities
Milling Quality
Chemical Criteria Of Quality
Moisture Content
Alpha-amylase Activity
Fat Acidity
Crude Fiber and Ash
Wheat-Grading Systems
Composition of Wheat
Proteins
Carbohydrates
Lipids
Minerals
Vitamins
Fiber
Pigments
Enzymes
Milling Principles
Extraction Rate and its Effect on Flour Composition
Grain Structure as Affecting Grinding
Definition of Flour Extraction
Stone-milling: Yields of Products
Roller-milling: Flour Extraction Rates
Extraction Rate and Flour Color
Some Factors Determining Commercial Extraction Rates
Changes in Ash, Thiamine, and Color with Increasing Extraction Rate
General Composition of Flours of different Extraction Rates
Effect of Increasing Extraction on Baking Quality
Roller-Milling Process
Breaking Process
Reduction Process
Grouping of Flour Streams According to
Composition: Effect of Change in Extraction Rate
Some Recent Developments

Characteristics of Individual Flour Streams in Milling of White Flour
Proportions and Ash Contents.
Reduction Flours
Minerals
Phosphorus
Other Minerals
Flour Streams
Gluten
Protein Peptization, Proteolysis, Viscosity
Fat
Sugars and Maltose Figure
Sugars
Maltose Figure
B-Vitamins
Thiamine
Riboflavin
Niacin
Pentosans
Loaf Crumb Color
Baking Quality
Water-Absorption
Bread
Cookies (Biscuits)
Dry-cleaning of Wheat
Wheat Conditioning, Moisture Movement,
Temperature Effects
Washing
Pick-up of Water by Wheat in Washing
Penetration Into Endosperm
Conditioning In Practice
Cold-Conditioning
Warm-Conditioning
Hot Conditioning
Steam-Treatment
Rolling Temperatures
Protein Displacement
Air Classification
Special Grinding of Flour
Usefulness of Products
Damage to Starch Granules in Milling
Factors In Individual Reductions
Coarse Particle (A) Reduction
F1ne Particle Reduction
Effects With Successive Reductions
Effect of Wheat Type
The Breaking System
Quantitative Assessments
Germ in Milling
Path of the Germ in Milling
Contribution to Oil of Flour
Endosperm Structure as Affected by Milling
Endosperm Cells
Cell Walls

Experimental Milling
Criteria of Flour Quality
Definition of Flour Quality
Flour Quality and Strength
Components of Quality
Protein Content
Flour Viscosity
Enzyme Content
Amylase
Protease
Lipase
Absorption
Ash and Flour Color
Granulation Or Particle Size
Response to Additives
Color-Removing Agents
Maturing Agents
Enzyme Supplementation
Starch Damage
Methodology
Microbiology
Summary
Wheat Pigments and Flour Colour
Chemical Nature of Wheat Pigments
Xanthophyll
Carotene
Flavones
Pigments in Wheat and Flour
Pigments in the Developing Grain
Determination of the Total of Yellow Pigments
In Flour Expressed as Carotenoids
Flour Color
Sources of Flour Colour
Methods of Measuring Flour Color
Technology of Flour Color
2. Rice
Production and Utilization
Origin of Rice
Comparison of Rice with Other Cereal Grains
Composition of Rice and Cereals
Breeding Rice Varieties With Specific
Industrial Uses for Rice and Rice by-Products
Caryopsis and Composition of Rice
Gross Structure of the Rice Caryopsis and its Milling Fractions
Gross Structure
Pericarp and Tegmen
Aleurone Layer
Embryo
Starchy Endosperm
Milling Fractions
Changes In Structure During Grain Development
Structure and Composition
Structure of the Rice Kernel

Important Components
Proteins
Starch
Lipids
    Vitamins
Minerals
Other Constituents
Criteria of Rice Quality
Objective Versus Subjective Measurements of Criteria
Varieties
Grain Size, Shape, Weight, and Uniformity
Color and Translucence
Test Weight
Moisture Content
Impurities and Damaged Rice
Dockage
Damaged Kernels
Chalky Grains
Red Rice
Seeds or Kernels
Odours
Milling Quality
Milling Yield
Degree of Milling
Physicochemical Tests
Rice Drying
Harvesting Methods
Optimum Harvest Time
Preharvest Chemical Drying
Rice-Drying Terminology and Fundamentals
Kinds of Rice
Milling Yields
Weights
Moisture Content
Equilibrium Moisture Content
Drying-Rate Computation
Drying Methods
Forced-Air Drying
Deep-bed Driers
Supplemental Heat
Materials-Handling for Bin Driers
Continuous-flow, Heated-Air Driers
Tempering
Combination System of Drying
Batch Driers
Other Drying Methods
Commercial Rice Drying
Types of Enterprise
Receiving and Storing Undried Rice
Method for Increasing Drier-Facility Capacity
Sun and Shade Drying
Threshing and Winnowing
Mechanical Drying

Seed Rice
Rice Milling Technology
Removal of Foreign Matter from Rough Rice
Removal of Hulls
Removal of Bran
Sizing of Milled Rice
Solvent Extractive Rice Milling
The X-m Concept
The Development of X-M
Process Description
X-M Products
X-M Milled Rice
X-M Bran
X-M Rice Oil
Rice Milling Yields
Technology Expansion Prospects
Rice Storage
Deterioration of Stored Rice by Fungi
Fungi Associated with Rice Deterioration
Effect on Economic Value
Effect on Nutritive Value
Mycotoxins
Factors Influencing Deterioration
Storage Technology
Rice Storage Structures
Turning
Aeration
Aeration-System Design
Measuring Airflow
Operation for Dry Rice
Operation for Undried Rice
Pest Control
Stored-grain Insects
Other Pests
3. Barley
Genetics and Breeding
Inheritance and Heritability
Biotechnology
Breeding
Population Breeding Methods
Hybrid Barley
Plant
Spike
Kernel
Soil and Climatic Requirements
Rotations
Planting
Fertilizing and Watcr Use
Harvesting
Pest Control
Diseases
Weeds
Insects

Chemical Composition
Carbohydrates
Starch
Soluble Sugars
Nonstarch Polysaccharides
Protein
Fats
Minerals
Vitamins
Phenolic Compounds
Processing and Utilization
Feed and Food Barley
Animal
Human
Malting Barley
Uses
Marketing
Classification and Prices Received
Storage
4. Corn
Anatomical Structure, Composition, and Properties
Corn Types and Their Compositions
Corn Quality and Grading Standards
Corn Utilization
Corn as Livestock Feed
Direct Utilization of Corn as Food
Alkali-Cooked Corn-based Foods
Sweet Corn
Popcorn, the Original Snack Food
Separation of Corn Into its Component Fractions
Dry Corn Milling
The Tempering-Degerming Milling Process
Products from the Tempering-Degerming Process
Wet Corn Milling
The Wet-Milling Process
Wet Corn Mill Products
Conversion of Raw Fractions into Value-Added Ingredients and Chemicals
Modified Starches
Corn Sweeteners
Furfural Production from Corncobs
5. The Millets
Introduction
Structure and Physical Properties
Composition
Polyphenols and Antlnutritional Factors
Postharvest Technology
Milling
Wet Milling
Food Uses
Nutritional Value
Feed Use
Nutritional Value
Human Studies

Effect of Decortication on Nutritional Value
6. Oats
History
Origin of Cultivated Oats
Genetics and Breeding
Cytogenetic Relationship of Species within Avena
Genetic Markers
Utilization of Germplasm Resources
Breeding
Breeding Objectives
Breeding Procedures
The Oat Plant
The Mature Grain
Chemical Composition
Protein
Protein Content and Distribution
Solubility Classification
Amino Acid Composition and Distribution
Lipids
Lipid Content and Distribution
Lipid Composition
Polysaccharides
Starch
B-glucan
Minerals
Vitamins
Processing and Utilization
Utilization
Processing
Cleaning
Drying and Cooling
Hulling
Cutting and Flaking
Oat Flour
7. Rye
Rye Breeding
Morphology and Kernel Characteristics
Growing Conditions
Rye Storage and Rye Grain Reserves and Disappearance
Rye Milling
Rye Flours
Nutrient Composition of Rye
Antinutritional Factors in Rye
Food Uses of Ryes
Industrial Uses of Rye
Rye As Animal Feed
8. Sorghum
Introduction
Origin
Structure and Physical Properties
Appearance of Sorghum Grain and its Genetics
Composition
Tannins and Polyphenols: Effects on Sorghum

Quality and Nutritional Value
Industrial Utilization
Wet Milling
Sorghum Starches
Dry Milling
Alcohol Production
Use of Sorghum for Beer and Malt
Lager Beer
Sorghum Malt
Clear Sorghum Beer
Sour, Opaque Beer
Processing For use in Feeds
Processing for Food
Traditional Food Systems
Sorghum in Baked and Pasta Products
Sorghum Syrup, Molasses, and Sugar
Nutritional Value
Nutritional Value of Sorghum as Livestock Feed
Human Digestibility Studies
Effect of Processing
9. Triticale
History
General Characteristics
Grain Development and Structure
Genetics and Breeding
Production
Quality Factors
Damaged Kernels
Defects
Dockage
Foreign Material
Heat-Damaged Kernels
Other
Shrunken and Broken Kernels
Basis of Determination
Ergoty Triticale
Garlicky Triticale
Light Garlicky Triticale
Light Smutty Triticale
Smutty Triticalp
Composition and Nutritional Factors
Utilization
Future
10. Photographs of Plant & Machinery with Supplier’s Contact Details
11. Sample Plant Layout and Process Flow Sheets

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 varies 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 **Website**: NIIR.org

Fri, 19 Apr 2024 16:16:39 +0530