

# CONTENTS

<i>Preface to the Third Edition</i>	vii
<i>Preface to the Revised Edition</i>	ix
<i>Preface to the First Edition</i>	xi

SECTION I	...1-122
-----------	----------

## **Grain Properties, Grain Drying and Dryers**

CHAPTER 1—PHYSICO-CHEMICAL PROPERTIES OF GRAINS	... 3
Structure, Chemical composition, Effects of temperature, Physical properties, Thermal properties and Aerodynamic properties.	
CHAPTER 2—PSYCHROMETRY	...11
Definitions, Wet bulb temperature, Wet bulb theory, Introduction to Psychrometric chart, Problems of psychrometry and exercises.	
CHAPTER 3—THEORY OF GRAIN DRYING	...25
Thin layer drying, Moisture measurement Equilibrium moisture content, Definitions, Constant-rate period, Falling-rate period, Mathematical modelling of thin layer grain drying, Determination of drying constant, Remarks on thin layer drying equations, Effect of different factors on drying process, Deep bed drying, Remarks on deep bed drying, Problems on drying and exercises.	
CHAPTER 4—METHODS OF GRAIN DRYING	...64
Classification of drying, Conduction drying, Convection drying, Radiation drying, Dielectric drying, Chemical drying and sack drying.	
CHAPTER 5—GRAIN DRYERS	...72
Unheated air dryers—storage unit, Aeration	

	system, Air distribution system, Heated air dryers—flat bed type batch dryer, Recirculatory batch dryers, Louisiana State University dryer, Baffle dryer and Rotary dryer.	
CHAPTER 6—	SELECTION, DESIGN, SPECIFICATIONS AND TESTING OF GRAIN DRYERS	...92
	Selection of dryers, Preliminary dryer selection, Comparison of dryers, Final selection of dryers, Design of grain dryers, Specifications of dryers, Testing of grain dryers—Simple method, Rigorous method, Problems on dryer design and exercises and Bibliography on section I.	
	SECTION II	...123–158

## Parboiling

CHAPTER 7—	PRINCIPLE OF PARBOILING OF PADDY	...125
	Physico-chemical changes during Parboiling and effects of parboiling on qualities of rice.	
CHAPTER 8—	PRACTICE OF PARBOILING OF PADDY	...136
	General, Traditional parboiling methods and Improved parboiling methods.	
CHAPTER 9—	PARBOILING OF WHEAT	...146
	Principles of parboiling of wheat, Methods of parboiling and production of bulgur—Batch method, Pretreatment process, Continuous process and Chemical lye peeling process and Bibliography on section II.	

	SELECTION III	...159–255
--	---------------	------------

## Milling

CHAPTER 10—	GENERAL GRAIN MILLING OPERATIONS	...161
	Cleaning/Separation—Classification of separation methods, Effectiveness of separation; Husking/Scouring/Hulling of grain—Methods of husking Husking/Hulling machines, Factors affecting effectiveness of hulling; Grinding Effectiveness of grinding, Machines used in	

	cereal grinding; Grinding of grains in roller mills and in hammer mills.	
CHAPTER 11—	HYDROTHERMAL TREATMENT/CONDITIONING OF CEREAL GRAINS	...181
	Changes owing to hydrothermal treatment—Physico-thermal properties, Biochemical properties, Physico-chemical Properties; Effects of different factors on the changes of various properties.	
CHAPTER 12—	RICE MILLING	...186
	Traditional rice milling machines, Modern rice milling machines: cleaning—General principles of cleaning, Open double-seive pre-cleaner, Single scalper drum cleaner (Japan), Paddy cleaner with stoner (Japan), Paddy cleaner (West Germany); Husking—Impact type paddy Husker, Rubber roller husker; Separation—Paddy separator (Japan), Paddy separator (European); Whitening—Vertical whitening machine (European), Horizontal rice whitening machine (Japan), and friction type rice whitening machine (Japan).	
CHAPTER 13—	MILLING OF CORN, WHEAT AND PULSES	...226
	Corn milling-composion and structure, Corn dry milling Corn wet milling: Wheat milling—Flour milling; Milling of pulses—Varieties, composition and structure, Traditional dry milling methods, Commercial milling of pulses by traditional methods, modern methods of pulses—milling (under study) and Bibliography on section III.	
	SECTION IV	...256–289

### **Processing of Oilseeds and Rice Bran**

CHAPTER 14—	PROCESSING OF OILSEEDS	...258
	General, production and refining of cotton seed oil, Solvent extraction of soyabean oil, Extraction of sunflower oil, Extraction of coconut oil and Bibliography.	

CHAPTER 15—UTILIZATION OF RICE BRAN	...270
General characteristics and chemical composition, Problems of processing, Factors affecting formation FFA in bran during storage.	

CHAPTER 16—METHODS OF UTILIZATION OF RICE BRAN	...279
General, Dry heat treatment, Wet heat treatment; Rice bran stabilizers; Extraction, of rice bran oil, solvent extraction method, Refining of crude rice bran oil into edible grade oil, Uses of bran, bran oil and various other constituents and Bibliography.	

SECTION V	...292–338
-----------	------------

### **Storage of Food Grain**

CHAPTER 17—FOOD GRAIN STORAGE	...292
Grain storage principles, Parameters affecting grains during storage, Changes occurring in food grains during storage—chemical, Physiological and biological, Moisture migration; Grain storage pests and their control, Detection of insect infestation, Grain storage pests, Important insect species, Control of stored food grain pests, Fumigation, Principles of fumigation, Properties and application of fumigants; Rodent control, Rodenticides for rats and mice, Preparation of baits; food grains and storage structures—Rural: traditional and improved storage structures; Bag and bulk storage; Godowns, Silos; Grain pressure theories, Janssen, Airy, Rankine and Coulomb equations; Economics of storage and processing of rice and Bibliography on section V	

<i>Appendix</i>	...339
-----------------	--------

<i>Index</i>	...348
--------------	--------