

## Cereals Novel Uses And Processes 1st Edition

Biotechnology is a collection of technologies that capitalise on the attributes of cells and biological molecules. Biotechnology will help improve the ability to customise therapies based on individual genomics; prevent, diagnose, and treat all types of diseases rather than rely on rescue therapy and provide breakthroughs in agricultural production and food safety. This book offers new research in this growing field. Whisky: Technology, Production and Marketing explains in technical terms the science and technology of producing whisky, combined with information from industry experts on successfully marketing the product. World experts in Scotch whisky provide detailed insight into whisky production, from the processing of raw materials to the fermentation, distillation, maturation, blending, production of co-products, and quality testing, as well as important information on the methodology used for packaging and marketing whisky in the twenty-first century. No other book covers the entire whisky process from raw material to delivery to market in such a comprehensive manner and with such a high level of technical detail. Only available work to cover the entire whisky process from raw material to delivery to the market in such a comprehensive manner Includes a chapter on marketing and selling whisky Foreword written by Alan Rutherford, former Chairman and Managing Director of United Malt and Grain Distillers Ltd.

Food Industry Wastes: Assessment and Recuperation of Commodities presents emerging techniques and opportunities for the treatment of food wastes, the reduction of water footprint, and creating sustainable food systems. Written by a team of experts from around the world, this book provides a guide for implementing bioprocessing techniques. It also helps researchers develop new options for the recuperation of these wastes for community benefit. More than 34 million tons of food waste was generated in the United States in 2009, at a cost of approximately \$43 billion. And while less than three percent of that waste was recovered and recycled, there is growing interest and development in recovering and recycling food waste. These processes have the potential not only to reduce greenhouse gases, but to provide energy and resources for other purposes. This book examines these topics in detail, starting with sources, characterization and composition of food wastes, and development of green production strategies. The book then turns to treatment techniques such as solid-state fermentation and anaerobic digestion of solid food waste for biogas and fertilizer. A deep section on innovative biocatalysts and bioreactors follows, encompassing hydrogen generation and thermophilic aerobic bioprocessing technologies. Rounding out the volume are extensive sections on water footprints, including electricity generation from microbial fuel cells (MFCs), and life cycle assessments. Food waste is an area of focus for a wide range of related industries from food science to energy and engineering Outlines the development of green product strategies International authoring team represents the leading edge in research and development Highlights leading trends of current research as well as future opportunities for reusing food waste

...an ideal information source for those involved in managing waste and recovering waste for use in products to produce revenue... (Food Science and Technology - review of Volume 1) This is a most welcome addition to the literature, likely to be essential study material for both technologists and process engineers. (The Chemical Engineer - review of Volume 1) Food processors are under pressure, both from consumers and legislation, to reduce the amount of waste they produce and to consume water and energy more efficiently. Handbook of waste management and co-product recovery in food processing provides essential information about the major issues and technologies involved in waste co-product valorisation, methods to reduce water and energy consumption, waste reduction in particular food industry sectors and end waste management. Opening chapters in Part one of Volume 2 cover economic and legislative drivers for waste management and co-product recovery. Part two discusses life cycle analysis and closed-loop production systems to minimise environmental impacts in food production. It also includes chapters on water and energy use as well as sustainable packaging. Part three reviews methods for exploiting co-products as food and feed ingredients, whilst the final part of the book discusses techniques for non-food exploitation of co-products from food processing. Provides essential information about the major issues and technologies involved in waste product valorisation Examines methods to reduce water and energy consumption in particular food industry sectors Discusses the economic and legislative drivers for waste management and co-product recovery

The Proceedings of the 12th International Cereal and Bread Congress provide a wide-ranging, comprehensive and up-to-date review of the latest advances in cereal science and technology with contributions from leading cereals institutes and individuals from around the world. They bring together all elements of the 'grain chain' from breeding of new wheat varieties through the milling processes and on to the conversion of flour into baked products ready for the consumer at large. Evaluating and predicting wheat flour properties require new equipment and new techniques and these are covered in depth. Cereals other than wheat are given due consideration. The versatility of wheat flour and its conversion into food is reviewed across a whole spectrum of products. There is a strong emphasis on the use of wheat flour for bread making but with consideration of applications in the manufacture of cakes, cookies, pastries, extruded foods, pasta and noodles. The development process and the benefits to consumers are also addressed. The Editors and the Organising Committee have assembled a collection of high-quality papers which provide a showpiece for the latest developments in cereal science and technology. Extensive collection of proceedings from the 12th International Cereal and Bread Congress High-quality papers highlighting the most recent developments in cereal science and technology Benefits for the industry and consumers are discussed

The third edition of this long-serving successful reference work is a 'must-have' reference for anyone needing or desiring an understanding of the structure, chemistry, properties, production and uses of starches and their derivatives. \* Includes specific information on corn, wheat, potato, rice, and new chapters on rye, oat and barley (including waxy barley) starches \* Covers the isolation processes, properties, functionalities, and uses of the most commonly used starches. \* Explores the genetics, biochemistry, and physical structure of starches \* Presents current and emerging application trends for starch

This collection of texts written by well-recognised specialists was constituted having in view these important directions of actual research. Sustainable economical growth requires safe resources of raw materials for the industrial production. Today's most frequently used industrial raw material, petroleum, is neither sustainable, because limited, nor environmentally friendly. While the economy of energy can be based on various alter-native raw materials, such as wind, sun, water, biomass, as well as nuclear fission and fusion, the economy of substances is fundamentally depending on biomass, in particular biomass of plants. In the last decades because of the crude oil and other natural resources crisis, a new alternative has been proposed consisting in utilisation of renewable natural resources as feedstock and fuel, among which the biomass is the most promising.

"So long as a person is capable of self renewal they are a living being. " -Amiel Cereals have been the source of life to the human race, providing nutritional and material needs since the dawn of civilization. As with all dynamic industries, the Cereal industry has renewed itself in the past; as the millennium approaches, it is on the brink of another renewal, in which the versatility and providence of cereals are being rediscovered, but in new and exciting ways. Cereals are richly diverse; over 10,000 varieties convert minerals and the energy of the sun into a bursting catalog of functional and versatile biomolecules and biopolymers. Processing technology allows these components to be accessed, separated, isolated and purified, while chemical science allows modification for even greater diversity and specificity. The last century has seen the move from cereal- to oil-based chemical and materials industries. But cereals contain a greater variety and functionality of macromolecules than oil. Starch, protein, bran and straw,

already diverse across cereal varieties, can be fractionated into more specific elements, modified chemically to enhance function, or used as feedstocks in fermentation-based bioconversion systems, to produce a range of bulk and fine chemicals for industries as diverse as food, pharmaceuticals, plastics, textiles, pulp and paper, transport, composites and boards, adhesives and energy.

There is little doubt that today's food industry is faced with a rapidly changing market landscape. The obvious need to continue to provide consumers with nutritious, delectable, safe, and affordable food products which are also profitable for food manufacturers, as well as the ongoing challenge of ensuring the delivery of adequate nutrition to hundreds of millions of disadvantaged people around the world, appears – at least as much as, if not more than, ever – to be at odds with the challenges posed by soaring energy and food commodity prices; fast-paced changes in consumer demographics, habits, and preferences; and the continual need to stay ahead of current and emerging food safety issues. In addition to this, the present ubiquity in the industry of terms such as functional foods, nutraceuticals, low sodium, low fat, clean label, minimal processing, and natural – to name a few – underscores yet a different dimension of the challenges faced by food processors today. On the other hand, however, the solutions of many of these challenges may, concurrently, present the food industry with unique and exciting opportunities. The processed meat industry, despite its long history and tradition, is certainly not exempt from having to face these modern challenges, nor excluded from realizing the promises of the opportunities that may lie ahead.

Agriculture depends on improved cultivars, and cultivars are developed through proper plant breeding. Unfortunately, applied plant breeding programs that are focused on cereal commodity crops are under serious erosion because of lack of funding. This loss of public support affects breeding continuity, objectivity, and, perhaps equally important, the training of future plant breeders and the utilization and improvement of plant genetic resources currently available. Breeding programs should focus not only on short-term research goals but also on long-term genetic improvement of germplasm. The research products of breeding programs are important not only for food security but also for commodity-oriented public and private programs, especially in the fringes of crop production. Breeding strategies used for long-term selection are often neglected but the reality is that long-term research is needed for the success of short-term products. An excellent example is that genetically broad-based public germplasm has significantly been utilized and recycled by industry, producing billions of dollars for industry and farmers before intellectual property rights were available. Successful examples of breeding continuity have served the sustainable cereal crop production that we currently have. The fact that farmers rely on public and private breeding institutions for solving long-term challenges should influence policy makers to reverse this trend of reduced funding. Joint cooperation between industry and public institutions would be a good example to follow. The objective of this volume is to increase the utilization of useful genetic resources and increase awareness of the relative value and impact of plant breeding and biotechnology. That should lead to a more sustainable crop production and ultimately food security. Applied plant breeding will continue to be the foundation to which molecular markers are applied. Focusing useful molecular techniques on the right traits will build a strong linkage between genomics and plant breeding and lead to new and better cultivars. Therefore, more than ever there is a need for better communication and cooperation among scientists in the plant breeding and biotechnology areas. We have an opportunity to greatly enhance agricultural production by applying the results of this research to meet the growing demands for food security and environmental conservation. Ensuring strong applied plant breeding programs with successful application of molecular markers will be essential in ensuring such sustainable use of plant genetic resources.

No further information has been provided for this title.--

There are 71 chapters in the book and authors from Australia, Brazil, Canada, China, Hong Kong, Japan, Mexico, Taiwan and the United States. The chapters are arranged under seven sections, which include General Topics in Food Science and Technology; Food Processing and Engineering; Antioxidants in Foods; Nutrition and Food Science; Food Safety; Sensory Science of Foods; and Food Biotechnology. Many of the chapters are exceptional in the quality and depth of science and state-of-the-art instrumentation and techniques used in the experimentation. There is literally a gold mine of new information available in this book, not only for healthful foods for the Pacific Rim but for many other areas as well.

An instructive and comprehensive overview of the use of biotechnology in agriculture and food production, *Biotechnology in Agriculture and Food Processing: Opportunities and Challenges* discusses how biotechnology can improve the quality and productivity of agriculture and food products. It includes current topics such as GM foods, enzymes, and prod

Biodegradable, polymer-based systems are playing an increasingly pivotal role in tissue engineering replacement and regeneration. This type of biology-driven materials science is slated to be one of the key research areas of the 21st century. The following aspects are crucial: the development of adequate human cell culture to produce the tissues in adequate polymer scaffold materials; the development of culture technology with which human tissues can be grown ex-vivo in 3D polymer matrices; the development of material technology for producing the degradable, 3D matrices, having mechanical properties similar to natural tissue. In addressing these and similar problems, the book contains chapters on biodegradable polymers, polymeric biomaterials, surface modification for controlling cell-material interactions, scaffold design and processing, biomimetic coatings, biocompatibility evaluation, tissue engineering constructs, cell isolation, characterisation and culture, and controlled release of bioactive agents.

Volume 40 of *Carbohydrate Chemistry: Chemical and Biological Approaches* demonstrates the importance of the glycosciences for innovation and societal progress. Carbohydrates are molecules with essential roles in biology and also serve as renewable resources for the generation of new chemicals and materials. Honouring Professor Andr Lubineau's memory, this volume resembles a special collection of contributions in the fields of green and low-carbon chemistry, innovative synthetic methodology and design of carbohydrate architectures for medicinal and biological chemistry. Green methodology is illustrated by accounts on the industrial development of water-promoted reactions (C-glycosylation, cycloadditions) and the design of green processes and synthons towards sugar-based surfactants and materials. The especially challenging transformations at the anomeric center are presented in several contributions on glycosylation methodologies using iron or gold catalysis, electrochemical or enzymatic (thio)glycosylation, exo-glycal chemistry and bioengineering of carbohydrate synthases. Then, synthesis and structure of multivalent and supramolecular oligosaccharide architectures are discussed and related to their physical properties and application potential, e.g. for deepening our understanding of biological processes, such as enzymatic pathways or bacterial adhesion, and design of antibacterial, antifungal and innovative anticancer vaccines or drugs.

Sets the stage for the development of sustainable, environmentally friendly fuels, chemicals, and materials Taking millions of years to form, fossil fuels are nonrenewable resources; it is estimated that they will be depleted by the end of this century. Moreover, the production and use of fossil fuels have resulted in considerable environmental harm. The generation of environmentally friendly energy from renewable sources such as biomass is therefore essential. This book focuses on the integration of green chemistry concepts into biomass processes and conversion in order to take full advantage of the potential of biomass to replace nonsustainable resources and meet global needs for fuel as well as other chemicals and materials. *The Role of Green Chemistry in Biomass Processing and Conversion* features contributions from leading experts from Asia, Europe, and North America. Focusing on lignocellulosic biomass, the most abundant biomass resource, the book begins with a general introduction to biomass and biorefineries and then provides an update on the latest advances in green chemistry that support biomass processing and conversion. Next, the authors describe current and emerging biomass processing and conversion techniques that use green chemistry technologies, including: Green solvents such as ionic liquids, supercritical CO<sub>2</sub>, and water Sustainable energy sources such as microwave irradiation and sonification Green catalytic technologies Advanced membrane separation technologies The last chapter of the book explores the ecotoxicological and environmental effects of converting and

using fuels, chemicals, and materials from biomass. Recommended for professionals and students in chemical engineering, green chemistry, and energy and fuels, *The Role of Green Chemistry in Biomass Processing and Conversion* sets a strong foundation for the development of a competitive and sustainable bioeconomy. This monograph includes a Foreword by James Clark (University of York, UK). This book summarizes available fiber sources and how they can be incorporated into new food products to provide improved health benefits. It rigorously examines health claims, recent research, and contradictory data; covers fiber for weight and glycemic control, and intestinal regularity; and discusses how food producers can find fiber sources and include fiber in their products. Critically examining current research and future directions, this resource blends coverage of the latest scientific information on the health benefits of fiber with information on how to formulate foods with higher concentrations of this vital nutrient.

Edited by a renowned seed biologist with a team assembled from the most respected laboratories worldwide, *Seed Technology and Its Biological Basis* illustrates the commercial value of seeds as a major resource. The editors provide a sweeping overview of the current state-of-the-art in seed technology and its biological basis. The book is invaluable to researchers and professionals in both the industrial and academic sectors.

This book explains how the use of whole plants and by-products can maximize efficiency in the European oil-crop supply chain.

Particle breakage is an important process within a wide range of solids processing industries, including pharmaceuticals, food, agricultural and mining. Breakage of particles can be defined as intentional and unintentional, depending on whether it is desired or not. Through understanding of the science and underlying mechanisms behind this phenomenon, particle breakage can be either minimised or encouraged within an efficient and effective process. *Particle Breakage* examines particle breakage at three different length scales, ranging from single particle studies through groups of particles and looking at solid processing steps as a whole. This book is the widest ranging book in the field and includes the most up-to-date techniques such as Distinct Element Method (DEM), Monte Carlo simulations and Population Balance Equations (PBE). This handbook provides an overview of the current state-of-the-art and particle breakage. From the small scale of a single particle, to the study of whole processes for breakage; both by experimental study and mathematical modelling. \* Covering a wide range of subjects and industrial applications \* Allows the reader an understanding of the science behind engineered breakage processes \* Giving an unrestricted and interdisciplinary approach

Given the environmental concerns and declining availability of fossil fuels, as well as the growing population worldwide, it is essential to move toward a sustainable bioenergy-based economy. However, it is also imperative to address sustainability in the bioenergy industry in order to avoid depleting necessary biomass resources. *Sustainable Bioenergy Production* provides comprehensive knowledge and skills for the analysis and design of sustainable biomass production, bioenergy processing, and biorefinery systems for professionals in the bioenergy field. Focusing on topics vital to the sustainability of the bioenergy industry, this book is divided into four sections: Fundamentals of Engineering Analysis and Design of Bioenergy Production Systems, Sustainable Biomass Production and Supply Logistics, Sustainable Bioenergy Processing, and Sustainable Biorefinery Systems. Section I covers the fundamentals of genetic engineering, novel breeding, and cropping technologies applied in the development of energy crops. It discusses modern computational tools used in the design and analysis of bioenergy production systems and the life-cycle assessment for evaluating the environmental sustainability of biomass production and bioenergy processing technologies. Section II focuses on the technical and economic feasibility and environmental sustainability of various biomass feedstocks and emerging technologies to improve feedstock sustainability. Section III addresses the technical and economic feasibility and environmental sustainability of different bioenergy processing technologies and emerging technologies to improve the sustainability of each bioenergy process. Section IV discusses the design and analysis of biorefineries and different biorefinery systems, including lignocellulosic feedstock, whole-crop, and green biorefinery.

This is the first scholarly reference work to cover all the major scientific themes and facets of the subject of seeds. It outlines the latest fundamental biological knowledge about seeds, together with the principles of agricultural seed processing, storage and sowing, the food and industrial uses of seeds, and the roles of seeds in history, economies and cultures. With contributions from 110 expert authors worldwide, the editors have created 560 authoritative articles, illustrated with plentiful tables, figures, black-and-white and color photographs, suggested further reading matter and 670 supplementary definitions. The contents are alphabetically arranged and cross-referenced to connect related entries.

*Chemical Engineering and Chemical Process Technology* is a theme component of Encyclopedia of Chemical Sciences, Engineering and Technology Resources in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty Encyclopedias. Chemical engineering is a branch of engineering, dealing with processes in which materials undergo changes in their physical or chemical state. These changes may concern size, energy content, composition and/or other application properties. Chemical engineering deals with many processes belonging to chemical industry or related industries (petrochemical, metallurgical, food, pharmaceutical, fine chemicals, coatings and colors, renewable raw materials, biotechnological, etc.), and finds application in manufacturing of such products as acids, alkalis, salts, fuels, fertilizers, crop protection agents, ceramics, glass, paper, colors, dyestuffs, plastics, cosmetics, vitamins and many others. It also plays significant role in environmental protection, biotechnology, nanotechnology, energy production and sustainable economical development. The Theme on Chemical Engineering and Chemical Process Technology deals, in five volumes and covers several topics such as: Fundamentals of Chemical Engineering; Unit Operations – Fluids; Unit Operations – Solids; Chemical Reaction Engineering; Process Development, Modeling, Optimization and Control; Process Management; The Future of Chemical Engineering; Chemical Engineering Education; Main Products, which

are then expanded into multiple subtopics, each as a chapter. These five volumes are aimed at the following five major target audiences: University and College students Educators, Professional practitioners, Research personnel and Policy analysts, managers, and decision makers and NGOs.

There has been a wealth of recent research on the complex changes involved in bread making and how they influence the many traits consumers use to define quality. Bread making: improving quality sums up this key research and what it means for improved process control and a better, more consistent product. After an introductory review of bread making as a whole part one discusses wheat and flour quality. Chapter 3 summarises current research on the structure of wheat, providing the context for chapters on wheat proteins (chapters 5 and 6) and starch (chapter 7). There are also chapters on ways of measuring wheat and flour quality, and improving flour for bread making. Part two reviews dough formation and its impact on the structure and properties of bread. It includes chapters on the molecular structure of dough, foam formation and bread aeration together with discussion of the role of key ingredients such as water. A final group of chapters then discusses other aspects of quality such as improving taste and nutritional properties, as well as preventing moulds and mycotoxin contamination. With its distinguished editor and international team of contributors, Bread making: improving quality is a standard work both for industry and the research community.

Surfactant research explores the forces responsible for surfactant assembly and the critical industrial, medical, and personal applications, including viscosity control, microelectronics, drug stabilization, drug delivery, cosmetics, enhanced oil recovery, and foods. Surfactant Science and Technology: Retrospects and Prospects, "a Festschrift in honor of Dr. Kash Mittal," provides a broad perspective with chapters contributed by leaders in the fields of surfactant-based physical, organic, and materials chemistries. Many of the authors participated in a special symposium in Melbourne, Australia, honoring Kash Mittal's 100th edited book at the 18th Surfactants in Solution (SIS) meeting. Each chapter provides an overview of a specific research area, with discussions on past, present, and future directions. The book is divided into six parts. Part I reviews the evolution of theoretical models for surfactant self-assembly, and introduces a model for interpreting ion-specific effects on aggregate properties. Part II focuses on interactions of surfactant solutions with solid supports; uses contact angles to understand hydrophobic/hydrophilic changes in a lipid layer; uses surface tension to understand molecular arrangements at interfaces; reviews spreading phenomena; discusses pattern formation on solid surfaces; and applies tensiometry to probe flavor components of espresso. Part III discusses novel DNA-based materials, multifunctional poly(amino acid)s-based graft polymers for drug delivery, and polymeric surfactants for stabilizing suspensions and emulsions. Part IV introduces farm-based biosurfactants from natural products and "greener" biosurfactants from bacteria. Part V explores lyotropic liquid crystals and their applications in triggered drug release; microemulsion properties and controlled drug release; the role of hydrotopes in formulations and in enhancing solubilization in liquid crystals; the potential of ionic liquids to generate tunable and selective reaction media; and provides an overview of stimuli-responsive surfactants. Focusing on emulsions, Part VI reviews the design of emulsion properties for various commercial applications, the role of surfactants in the oil and gas industries, and surfactant mechanisms for soil removal via microemulsions and emulsification.

This new edition of The Expanding World of Chemical Engineering provides an overview of recent and future developments in chemical engineering and future aspects in chemical engineering. The book is written by leading researchers in various fields of expertise and covers most important topics in chemical engineering. The topics covered include; computer application, material design, supercritical fluid technology, colloid and powder technology, new equipment, bio and medical technology and environmental preservation and remediation. This is a valuable book for students at all levels as well as for practitioners in chemical engineering and industry.

The chemical industry processes a high proportion of its products in powder form, thus making the efficient, effective and safe handling and processing of powders of prime importance. Powders and Solids: Developments in Handling and Processing Technologies brings the reader right up-to-date with both newly-introduced commercial practices and results of recent fundamental research on the behaviour of model powders. Case studies are also included. Commencing with an overview of developments in the health and safety aspects of handling powders, the book then goes on to look at the new technologies being applied to powders and powder handling, followed by aspects of measurement and control in powder handling. It will be essential reading for all industrial practitioners, particularly those in the pharmaceutical industry, as well as all engineers working either in industry or research on processes involving solid and powder handling.

Food and Industrial Bioproducts and Bioprocessing describes the engineering aspects of bioprocessing, including advanced food processing techniques and bioproduct development. The main focus of the book is on food applications, while numerous industrial applications are highlighted as well. The editors and authors, all experts in various bioprocessing fields, cover the latest developments in the industry and provide perspective on new and potential products and processes. Challenges and opportunities facing the bioproduct manufacturing industry are also discussed. Coverage is far-reaching and includes: current and future biomass sources and bioprocesses; oilseed processing and refining; starch and protein processing; non-thermal food processing; fermentation; extraction techniques; enzymatic conversions; nanotechnology; microencapsulation and emulsion techniques; bioproducts from fungi and algae; biopolymers; and biodegradable/edible packaging. Researchers and product developers in food science, agriculture, engineering, bioprocessing and bioproduct development will find Food and Industrial Bioproducts and Bioprocessing an invaluable resource.

Comprehensive and international in content, Dietary anticarcinogens and antimutagens: Chemical and biological aspects includes topics as diverse as the health benefits of tea, wine and beer, through the prevention of various cancers, to the development of effective communication for healthy eating. The book is organised in to sections covering: epidemiology of diet and cancer; mechanisms of DNA damage and repair; the body's various protective mechanisms; and experimental approaches to the study of diet and cancer, with particular emphasis on humans as subjects.

Maize is a globally important crop mainly utilized as feed, food and raw material for diverse industrial applications. Among cereals, it occupies third place after rice and wheat and is a staple

food for a large segment of population worldwide particularly in the Asian as well as African countries. This monogram discusses various aspects of nutritional quality of maize such as quality protein maize which has been considered as most significant discovery in enhancing nutritional quality of cereals in terms of increasing the concentration of essential amino acids. The biochemistry of starch which is an important industrial product of maize has been discussed in detail. Further, the role of maize oil which is highly regarded for human consumption as it reduces the blood cholesterol concentration has also been elaborated. Naturally, maize is a rich source of carotenoids such as beta-carotene, zeaxanthin, lutein, cryptoxanthin which have highly diverse health benefits ranging from maintaining normal vision to lowering of oxidative stress. The need for biofortification of maize for provitamin A carotenoids and their role in alleviating vision impairments have also been discussed. The effect of various biotic and abiotic stresses particularly carbon dioxide and temperature on quality has been discussed thoroughly. Many value-added products as well as fermented foods that have been produced from maize which is consumed in different forms worldwide are also discussed. The aspects related to the maize application as fodder and as a source of malting have also been covered concisely. Overall, the book provides complete information about various quality aspects of maize. The various stakeholders such as maize researchers, extension specialists, students, teachers as well as farmers will be immensely benefitted from this monogram.

*Biomass to Renewable Energy Processes, Second Edition*, explains the theories of biological processes, biomass materials and logistics, and conversion technologies for bioenergy products such as biogas, ethanol, butanol, biodiesel, and synthetic gases. The book discusses anaerobic digestion of waste materials for biogas and hydrogen production, bioethanol and biobutanol production from starch and cellulose, and biodiesel production from plant oils. It addresses thermal processes, including gasification and pyrolysis of agricultural residues and woody biomass. The text also covers pretreatment technologies, enzymatic reactions, fermentation, and microbiological metabolisms and pathways.

Sugarcane has garnered much interest for its potential as a viable renewable energy crop. While the use of sugar juice for ethanol production has been in practice for years, a new focus on using the fibrous co-product known as bagasse for producing renewable fuels and bio-based chemicals is growing in interest. The success of these efforts, and the development of new varieties of energy canes, could greatly increase the use of sugarcane and sugarcane biomass for fuels while enhancing industry sustainability and competitiveness. *Sugarcane-Based Biofuels and Bioproducts* examines the development of a suite of established and developing biofuels and other renewable products derived from sugarcane and sugarcane-based co-products, such as bagasse. Chapters provide broad-ranging coverage of sugarcane biology, biotechnological advances, and breakthroughs in production and processing techniques. This text brings together essential information regarding the development and utilization of new fuels and bioproducts derived from sugarcane. Authored by experts in the field, *Sugarcane-Based Biofuels and Bioproducts* is an invaluable resource for researchers studying biofuels, sugarcane, and plant biotechnology as well as sugar and biofuels industry personnel.

This book is a collection of chapters concerning the use of biomass for the sustainable production of energy and chemicals—an important goal that will help decrease the production of greenhouse gases to help mitigate global warming, provide energy security in the face of dwindling petroleum reserves, improve balance of payment problems and spur local economic development. Clearly there are ways to save energy that need to be encouraged more. These include more use of energy sources such as, among others, manure in anaerobic digesters, waste wood in forests as fuel or feedstock for cellulosic ethanol, and conservation reserve program (CRP) land crops that are presently unused in the US. The use of biofuels is not new; Rudolf Diesel used peanut oil as fuel in the first engines he developed (Chap. 8), and ethanol was used in the early 1900s in the US as automobile fuel [Songstad et al. (2009) Historical perspective of biofuels: learning from the past to rediscover the future. *In Vitro Cell Dev Biol Plant* 45:189–192). Brazil now produces enough sugar cane ethanol to make up about 50% of its transportation fuel needs (Chap. 4). The next big thing will be cellulosic ethanol. At present, there is also the use of *Miscanthus x giganteus* as fuel for power plants in the UK (Chap. 2), bagasse (sugar cane waste) to power sugar cane mills (Chap. 4), and waste wood and sawdust to power sawmills (Chap. 7).

Food packaging performs an essential function, but packaging materials can have a negative impact on the environment. This collection reviews bio-based, biodegradable and recycled materials and their current and potential applications for food protection and preservation. The first part of the book looks at the latest advances in bio-based food packaging materials. Part two discusses the factors involved in choosing alternative packaging materials such as consumer preference, measuring the environmental performance of food packaging, eco-design, and the safety and quality of recycled materials. Part three contains chapters on the applications of environmentally-compatible materials in particular product sectors, including the packaging of fresh horticultural produce, dairy products and seafood. This section also covers active packaging, modified atmosphere packaging and biobased intelligent food packaging. The book finishes with a summary of the legislation and certification of environmentally-compatible packaging in the EU. With its distinguished editor and contributors, *Environmentally-compatible food packaging* is a valuable reference tool for professionals in the food processing and packaging industries.

Reviews bio-based, biodegradable and recycled materials and their current and potential applications Discusses consumer preference, environmental performance, eco-design and the quality of recycled materials as factors involved in choosing alternative packaging materials Summarises EU legislation and certification of environmentally compatible packaging

Interest in cereals and other healthy grains has increased considerably in recent years, driving the cereal processing industry to develop new processing technologies that meet consumer demands for sustainable and nutritious cereal products. *Innovative Processing Technologies for Healthy Grains* is the first dedicated reference to focus on advances in cereal processing and bio-refinery of cereals and pseudocereals, presenting a broad overview of all aspects of both conventional and novel processing techniques and methods. Featuring contributions from leading researchers and academics, this unique volume examines the selection and characteristics of raw ingredients, new and emerging processing technologies, novel cereal-based products, and global trends in cereal and pseudocereal use, processing and consumption. The text offers balanced coverage of advances in both the development and processing of cereal and pseudocereal products, exploring topics including gluten-free products, cereal-based animal feed, health and wellness trends in healthy grain consumption, bioaccessibility and bioavailability of nutritional compounds, gluten-free products, and the environmental impact of processed healthy grains. This timely and comprehensive volume: Focuses on innovative cereal processing and bio-refinery of cereals and pseudocereals Provides informed perspectives on the current global trends in cereal and pseudocereal use, processing and consumption Describes the characteristics of healthy grains and their production, nutritional value, and utilization Explains the origin, production, processing, and functional ingredients of pseudocereals Reviews healthy grain products such as cereal-based beverages, fortified grain-based products, and cereal-based products with bioactive benefits Part of Wiley's IFST Advances in Food Science series *Innovative Processing Technologies for Healthy Grains* is an essential resource for food scientists, technologists, researchers, and other professionals working in the grain industry, and academics and advanced students of food technology and food science.

In order to successfully compete as a sustainable energy source, the value of biomass must be maximized through the production of valuable co-products in the biorefinery. Specialty chemicals and other biobased products can be extracted from biomass prior to or after the conversion process, thus increasing the overall profitability and sustainability of the biorefinery. *Biorefinery Co-Products* highlights various

co-products that are present in biomass prior to and after processing, describes strategies for their extraction , and presents examples of bioenergy feedstocks that contain high value products. Topics covered include: Bioactive compounds from woody biomass Phytochemicals from sugar cane, citrus waste and algae Valuable products from corn and other oil seed crops Proteins from forages Enhancing the value of existing biomass processing streams Aimed at academic researchers, professionals and specialists in the bioenergy industry, Biorefinery Co-Products is an essential text for all scientists and engineers working on the efficient separation, purification and manufacture of value-added biorefinery co-products. For more information on the Wiley Series in Renewable resources, visit [www.wiley.com/go/rrs](http://www.wiley.com/go/rrs)

Cereals processing is one of the oldest and most important of all food technologies. Written by a distinguished international team of contributors, Cereals Processing Technology reviews the range of cereal products and technologies used to produce them. It is designed for all those involved in cereals processing, whether raw material producers and refiners needing to match the needs of secondary processors benchmarking their operations against the best prices in their sector and across cereals processing as a whole. Part 1 looks at cereal and flour production, with chapters on cereal and production methods and flour milling. There is also a chapter on the increasingly important and controversial area of cereal biotechnology and its application to wheat, barley, rice, and maize. Part 2 looks at how these raw materials are then processed into final products for the consumer. There are chapters on rice and rice product production, pasta and Asian noodle processing, the manufacture of breakfast cereals, malting, and breadmaking. Chapters look at the increasing diversity of cereal products, at current best practice in manufacturing processes, and emerging trends in the technologies for particular products. Cereals Processing Technology provides an authoritative guide to some of the key technological developments both within particular sectors and across cereals processing as a whole.

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