

Advances In Food Extrusion Technology Contemporary Food Engineering

This volume covers many new trends and developments in food science, including preparation, characterization, morphology, properties, and recyclability. The volume considers food quality, shelf life, and manufacturing in conjunction with human nutrition, diet, and health as well as the ever-growing demand for the supply and production of healthier foods. Distinguished scientists specializing in various disciplines discuss basic studies, applications, recent advances, difficulties, and breakthroughs in the field. The volume includes informative discussions and new research on food formulations, manufacturing techniques, biodegradably flexible packaging, packaged foods, beverages, fruits and vegetable processing, fisheries, milk and milk products, frozen food and thermo processing, grain processing, meat and poultry processing, rheological characteristics of foods, heat exchangers in the food industry, food and health (including natural cures and food supplements), spice and spice processing, and more.

The Opuntia fruits, commonly known as cactus pears or prickly pears, have been suggested by the Food and Agriculture Organization to be a promising and strategic crop in regions suffering from lack of water. In Mexico, India, South Africa, and the Mediterranean, the Opuntia fruits have become popular due to their nutritive value and health-promoting benefits, including antioxidant, antiulcerogenic and antiatherogenic traits and protective effects against LDL oxidation. Additionally, readily absorbable sugars, high vitamin C and mineral content, and a pleasant flavour make Opuntia tailor-made for novel foods. Due to their ecological advantages, high functional value, and health-related traits, Opuntia fruits can be highly exploited in different food processing applications. For instance, Opuntia cactus fruits are used for the preparation of juices and marmalades; Opuntia cactus plants are used to feed animals in African and Latin American countries; Peruvian farmers cultivate Opuntia cactus for growing the cochineal (*Dactylopius coccus*) insect and producing the natural dye carmine; and the commercial production of food and non-food products from Opuntia has been established in Mexico, USA and several Mediterranean countries. Opuntia spp.: Chemistry, Bioactivity and Industrial Applications creates a multidisciplinary forum of discussion on Opuntia cactus with special emphasis on its horticulture, post-harvest, marketability, chemistry, functionality, health-promoting properties, technology and processing. The text includes detailed discussion of the impact of traditional and innovative processing on the recovery of high-added value compounds from Opuntia spp. by-products. Later chapters explore the potential applications of Opuntia spp. in food, cosmetics and pharmaceutical products.

This first comprehensive overview of reactive extrusion technology for over a decade combines the views of contributors from both academia and industry who share their experiences and highlight possible applications and markets. They also provide updated information on the underlying chemical and physical concepts, summarizing recent developments in terms of the material and machinery used. As a result, readers will find here a compilation of potential applications for reactive extrusion to access new and cost-effective polymeric materials, while using existing compounding machines.

Food Engineering Handbook, Two-Volume Set provides a stimulating and up-to-date review of food engineering phenomena. It also addresses the basic and applied principles of food engineering methods used in food processing operations around the world. Combining theory with a practical, hands-on approach, this set examines the thermophysical properties and modeling of selected processes such as chilling, freezing, and dehydration, and covers the key aspects of food engineering, from mass and heat transfer to steam and boilers, heat exchangers, diffusion, and absorption. Comprised of Food Engineering Handbook: Food Engineering Fundamentals and Food Engineering Handbook: Food Process Engineering, this comprehensive resource: Explains the interactions between different food constituents that might lead to changes in food properties Describes the characterization of the heating behavior of foods, their heat transfer, heat exchangers, and the equipment used in each food engineering method Discusses rheology, fluid flow, evaporation, distillation, size reduction, mixing, emulsion, and encapsulation Provides case studies of solid-liquid and supercritical fluid extraction and food behaviors Explores fermentation, enzymes, fluidized-bed drying, and more Presenting cutting-edge information on new and emerging food engineering processes, Food Engineering Handbook, Two-Volume Set offers a complete reference on the fundamental concepts, modeling, quality, safety, and technologies associated with food engineering and processing operations today.

Packed with case studies and problem calculations, Handbook of Food Processing: Food Safety, Quality, and Manufacturing Processes presents the information necessary to design food processing operations and describes the equipment needed to carry them out in detail. It covers the most common and new food manufacturing processes while addressing rele

This book constitutes the refereed post-conference proceedings of the 6th International Conference on Advancement of Science and Technology, ICAST 2018, which took place in Bahir Dar, Ethiopia, in October 2018. The 47 revised full papers were carefully reviewed and selected from 71 submissions. The papers present economic and technologic developments in modern societies in five tracks: agro-processing industries for sustainable development, water resources development for the shared vision in blue Nile basin, IT and computer technology innovation, recent advances in electrical and computer engineering, progresses in product design and system optimization.

A fresh view of the state-of-the-art, Advances in Food Extrusion Technology focuses on extruder selection, extrudate development, quality parameters, and troubleshooting in the 21st century extrusion process. In particular, the book: Introduces the history, nomenclature, and working principles of extrusion technology Presents an overview of various t

For several years, the food industry has been interested in identifying components in foods which have health benefits to be used in the development of functional food and nutraceutical products. Examples of these ingredients include fibre, phytosterols, peptides, proteins, isoflavones, saponins, phytic acid, probiotics, prebiotics and functional enzymes. Although much progress has been made in the identification, extraction and characterisation of these ingredients, there remains a need for ready and near-market platform technologies for processing these ingredients into marketable value-added functional food and nutraceutical products. This book looks at how these ingredients can be effectively incorporated into food systems for market, and provides practical guidelines on how challenges in specific food sectors (such as health claims and marketing) can be addressed during processing. Nutraceutical and Functional Food Processing Technology is a comprehensive overview of current and emerging trends in the formulation and manufacture of nutraceutical and functional food products. It highlights the distinctions between foods falling into the nutraceutical and functional food categories. Topics include sustainable and environmentally-friendly approaches to the production of health foods,

guidelines and regulations, and methods for assessing safety and quality of nutraceutical and functional food products. Specific applications of nutraceuticals in emulsion and salad dressing food products, beverages and soft drinks, baked goods, cereals and extruded products, fermented food products are covered, as are novel food proteins and peptides, and methods for encapsulated nutraceutical ingredients and packaging. The impact of processing on the bioactivity of nutraceutical ingredients, allergen management and the processing of allergen-free foods, health claims and nutraceutical food product commercialization are also discussed. Nutraceutical and Functional Food Processing Technology is a comprehensive source of practical approaches that can be used to innovate in the nutraceutical and health food sectors. Fully up-to-date and relevant across various food sectors, the book will benefit both academia and industry personnel working in the health food and food processing sectors.

High pressure processing is a fast-growing food processing technology and opens the door to nearly-fresh products that retain their sensorial and nutritional qualities. High Pressure Processing of Fruit and Vegetable Products reviews and summarizes the latest advances in novel high-pressure processing techniques for preserving fruits, fruit juices, and their mixtures. It contains basic information on the relation of high-process treatment parameters with the safety and quality of fruit and vegetable juices/products. The book focuses on product quality parameters, nutritional value, bio-active health components, and microbial safety and stability. The main aim of this book is to summarize the advances in the utilization of modern high pressure pasteurization (HPP) treatment to preserve and stabilize fruit and vegetable products. HPP technology is related to the product quality parameters, the content of nutritional and health active components, and the microbial safety and subsequent shelf life. One chapter of this book is devoted to industrial equipment available; other chapters deal with examples of commercial fruit and vegetable products. Another chapter of this book is dedicated to packaging, as packaging of food before HPP is mandatory in this technology. The regulatory aspects for high-pressure treated fruit and vegetable products in different regions of the world (Europe, the United States, Asia, and Australia) are also an important topic dealt within one chapter of the book. The effects of HPP technology on the quality of fruit and vegetable products, namely nutrients and stability, health active components, and sensory aspects, are reviewed in a trio of chapters.

Developments of aquaculture and animal feeds and extrusion technology. quality of fish meal, dietary ingredients, nutrients requirements of fish and crustaceans. Use of extruded feed in fish food. Nutrition and feeding of red drum and hybrid striped bass. Biotechnology and bioremediation practices in aquaculture. Advances in food extrusion technology. Food processing technologies are an essential link in the food chain. These technologies are many and varied, changing in popularity with changing consumption patterns and product popularity. Newer process technologies are also being evolved to provide the added advantages. Conventional and Advanced Food Processing Technologies fuses the practical (application, machinery), theoretical (model, equation) and cutting-edge (recent trends), making it ideal for industrial, academic and reference use. It consists of two sections, one covering conventional or well-established existing processes and the other covering emerging or novel process technologies that are expected to be employed in the near future for the processing of foods in the commercial sector. All are examined in great detail, considering their current and future applications with added examples and the very latest data. Conventional and Advanced Food Processing Technologies is a comprehensive treatment of the current state of knowledge on food processing technology. In its extensive coverage, and the selection of reputed research scientists who have contributed to each topic, this book will be a definitive text in this field for students, food professionals and researchers.

Global oilseeds industry is expected to expand in the future but would also constitute a platform for a variety of other products from processing waste such as protein meals and aromatic compounds. Edible Oils: Extraction, Processing, and Applications intends to present up to date technologies that are currently used for the extraction and refining of Edible Oils while proposing potential applications for its derivatives. This contribution pushes to consider market transformation driven by environmental concerns and customer's envy to bring quality attributes, energy efficiency and waste disposal into the heart of innovation. This work is aimed at professionals and academics including researchers, engineers and managers engaged in food and green engineering disciplines and ambitions to stand as a reference for students and lecturers. The readers will find a wealth of knowledge about the fundamentals of unit operations such as extraction and separation while presenting concepts of biorefinery for product and value creation from certain edible seeds. Novelties includes novel approaches for green solvent development in extraction, and examples of life cycle assessment of production systems for certain vegetable oils comprising product, service and waste management systems. Furthermore, this book focuses attention to production, processing, and current applications of palm oil, as an important commodity in Asia and addresses global market changes and important factors that influence its future prospects.

Food Processing Technology: Principles and Practice, Fourth Edition, has been updated and extended to include the many developments that have taken place since the third edition was published. The new edition includes an overview of the component subjects in food science and technology, processing stages, important aspects of food industry management not otherwise considered (e.g. financial management, marketing, food laws and food industry regulation), value chains, the global food industry, and over-arching considerations (e.g. environmental issues and sustainability). In addition, there are new chapters on industrial cooking, heat removal, storage, and distribution, along with updates on all the remaining chapters. This updated edition consolidates the position of this foundational book as the best single-volume introduction to food manufacturing technologies available, remaining as the most adopted standard text for many food science and technology courses. Updated edition completely revised with new developments on all the processing stages and aspects of food industry management not otherwise considered (e.g. financial management, marketing, food laws, and food industry regulation), and more Introduces a range of processing techniques that are used in food manufacturing Explains the key principles of each process, including the equipment used and the effects of

processing on micro-organisms that contaminate foods Describes post-processing operations, including packaging and distribution logistics Includes extra textbook elements, such as videos and calculations slides, in addition to summaries of key points in each chapter

Authored by world experts, the Handbook of Food Processing, Two-Volume Set discusses the basic principles and applications of major commercial food processing technologies. The handbook discusses food preservation processes, including blanching, pasteurization, chilling, freezing, aseptic packaging, and non-thermal food processing. It describes com

Light Scattering Technology for Food Property, Quality and Safety Assessment discusses the development and application of various light scattering techniques for measuring the structural and rheological properties of food, evaluating composition and quality attributes, and detecting pathogens in food. The first four chapters cover basic concepts, principles, theories, and modeling of light transfer in food and biological materials. Chapters 5 and 6 describe parameter estimation methods and basic techniques for determining optical absorption and scattering properties of food products. Chapter 7 discusses the spatially-resolved measurement technique for determining the optical properties of food and biological materials, whereas Chapter 8 focuses on the time-resolved spectroscopic technique for measuring optical properties and quality or maturity of horticultural products. Chapter 9 examines practical light scattering techniques for nondestructive quality assessment of fruits and vegetables. Chapter 10 presents the theory of light transfer in meat muscle and the measurement of optical properties for determining the postmortem condition and textural properties of muscle foods and meat analogs. Chapter 11 covers the applications of spatially-resolved light scattering techniques for assessing quality and safety of animal products. Chapter 12 looks into light scattering for milk and dairy processing. Chapter 13 examines the applications of dynamic light scattering for measuring the microstructure and rheological properties of food. Chapter 14 shows the applications of a biospeckle technique for assessing the quality and condition of fruits and vegetables. Chapter 15 provides a detailed description of Raman scattering spectroscopic and imaging techniques in food quality and safety assessment. Chapter 16, the final chapter, focuses on applications of light scattering techniques for the detection of food-borne pathogens.

Since many processes in the food industry involve fluid flow and heat and mass transfer, Computational Fluid Dynamics (CFD) provides a powerful early-stage simulation tool for gaining a qualitative and quantitative assessment of the performance of food processing, allowing engineers to test concepts all the way through the development of a process or system. Published in 2007, the first edition was the first book to address the use of CFD in food processing applications, and its aims were to present a comprehensive review of CFD applications for the food industry and pinpoint the research and development trends in the development of the technology; to provide the engineer and technologist working in research, development, and operations in the food industry with critical, comprehensive, and readily accessible information on the art and science of CFD; and to serve as an essential reference source to undergraduate and postgraduate students and researchers in universities and research institutions. This will continue to be the purpose of this second edition. In the second edition, in order to reflect the most recent research and development trends in the technology, only a few original chapters are updated with the latest developments. Therefore, this new edition mostly contains new chapters covering the analysis and optimization of cold chain facilities, simulation of thermal processing and modeling of heat exchangers, and CFD applications in other food processes.

Thermal processing remains one of the most important processes in the food industry. Now in its second edition, Thermal Food Processing: New Technologies and Quality Issues continues to explore the latest developments in the field. Assembling the work of a worldwide panel of experts, this volume highlights topics vital to the food industry today an

Advances in Postharvest Fruit and Vegetable Technology examines how changes in community attitudes and associated pressures on industry are demanding changes in the way technology is used to minimize postharvest loss and maintain product quality. In particular, the book discusses important drivers for change, including: Using more natural chemicals or physical treatments to replace synthetic chemicals Increasing the efficiency of older, more traditional methods in combination with newer biocontrol treatments Leveraging a range of biomolecular research tools or "omics" to efficiently gather and assess mass information at molecular, enzymic, and genetic levels Using modelling systems to identify key changes and control points for better targeting of new treatments and solutions to postharvest problems The postharvest handling of fresh fruits and vegetables plays a critical role in facilitating a continuous supply of high-quality fresh produce to the consumer. Many new technologies developed and refined in recent years continue to make possible an ever-expanding supply of fresh products. This volume examines a range of recently developed technologies and systems that will help the horticulture industry to become more environmentally sustainable and economically competitive, and to minimize postharvest quality loss and generate products that are appealing and acceptable to consumers.

Advances in Food and Nutrition Research recognizes the integral relationship between the food and nutritional sciences and brings together outstanding and comprehensive reviews that highlight this relationship. Contributions detail the scientific developments in the broad areas encompassed by the fields of food science and nutrition and are intended to ensure that food scientists in academic and industry as well as professional nutritionists and dieticians are kept informed concerning emerging research and developments in these important disciplines. This volume includes three thematic chapters: The Role of Flavoring Substances in Food Allergy and Intolerance The Use of Amino Acid Sequence Alignments to Assess Potential Allergenicity of Proteins Used in Genetically Modified Foods Sequence Databases for Assessing the Potential Allergenicity of Proteins Used in Transgenic Foods

Technological Interventions in Processing of Fruits and Vegetables presents a wide selection of the latest concepts in the fast-changing field of processing of fruits and vegetables (FAV). It provides key information on many new and different techniques used for processing of fruits and vegetables while also exploring the pros and cons of the various methods. There is an urgent need to explore and investigate waste in the processing of fruits and vegetables and how different processing technologies can be used most effectively. This volume, in short, conveys the key

concepts and role of different technology in processing of fruits and vegetables, keeping mind the special processing requirements of fruits and vegetables, waste issues, nutritional value, and consumer concerns. This volume offers a wealth of information on today's technology for fruit and vegetable processing and will be a valuable resource for industry professionals, agricultural/food processing researchers, faculty and upper-level students, and others.

Biofortification, which can be defined as the process of increasing the content/density of essential nutrients and/or its bioavailability of food with valuable compounds, is a promising means of increasing nutrient intakes. Traditional fortification practices in which exogenous nutrients are added to food can increase the content of nutrients but the use of biofortified foods with nutrients also may deliver the compounds in a more available form, as well as boost the overall relative effectiveness of these foods in raising nutrients status. Food Biofortification Technologies presents the state of the art in the field of novel methods of fortification and agricultural treatments as a way to improve the quality of obtained food products or compounds enriched with valuable nutrients. The book deals with fortification methods and agricultural treatments, which can improve the quality of food products or other agricultural compounds, providing them with a higher density of valuable nutrients. The utilization of novel products, such as feed additives and fertilizers, can avert nutrients depletion in food products. The book describes new and conventional methods of introducing valuable compounds into food components and presents the application of biosorption, bioaccumulation, and utilization of fertilizers in obtaining designer food. Attention is paid to the use of biomass as the carrier of nutrients such as microelements into the food components. The chapters are dedicated to specific food products and their nutrient components. The first chapter discusses the agronomic biofortification with micronutrients where the fertilization strategies are pointed out as a key to plant/cereals fortification. Other chapters present the fortification of animal foodstuffs such as meat, fish, milk, and eggs as well as the fortification of plant foodstuffs such as vegetables, fruits, and cereals. The book also explores advances in food fortification with vitamins and co-vitamins, essential minerals, essential fatty and amino acids, phytonutrients, and enzymes.

Food biotechnology's typical developments and applications have occurred in the fields of genetics and in enzyme- and cell-based biological processes, with the goal of producing and improving food ingredients and foods themselves. While these developments and applications are usually well reported in terms of the underlying science, there is a clear

One of the main concerns of the food industry is the need for high-quality fresh fruits and fruit products with good sensory quality, long shelf life, and high nutritional value. To meet these demands, new processing technologies are under investigation and development. Advances in Fruit Processing Technologies incorporates fundamentals in food processing as well as the advances made in recent years to improve final product quality. With contributions from a panel of international researchers who present a blend of classical and emerging technologies, the book explores: Ozone, ultrasound, irradiation, pulsed electric field, vacuum frying, and high-pressure processing Ultraviolet and membrane processing Enzymatic maceration, freeze concentration, and refrigeration The effect of processing on sensory characteristics and nutritional value New trends in modified atmosphere packaging The use of fruit juices as a vehicle for probiotic microorganisms Prebiotic oligosaccharides as an alternative for dairy products Incorporating a series of case studies on the application of various technologies, the book reviews their advantages, limitations, successes, and failures. The contributors also examine the implications of food processing technologies on waste production, energy use, and resource requirements. This comprehensive survey of methods for optimizing fruit quality is an ideal resource for those in the fruit and vegetable industry looking for innovations that can improve efficiency, reduce waste, and cut costs.

Due to their unique properties and ability to interact with other food components, biopolymers have traditionally played a major role in food processing. Biopolymer Engineering in Food Processing explores processing technology associated with biopolymer applications and discusses both operational and economic aspects. Following an overview of biopolymer applications and their functionality in different processes, the text examines: Production routes, availability, costs, and physicochemical properties of commercial biopolymers Rheology of biopolymer suspensions, how concentration and shear may affect their flow behavior, and their response to pressure losses and heat transfer during flow Effects of food processing and storage conditions on the viscoelastic and textural properties of food gels Mechanical and mass transfer properties of films and coating produced from biopolymers, composites, and nanocomposites The use of biopolymer coatings to reduce oil uptake during deep-fat frying of foods and in modified atmosphere storage of foods The book also explores the application of biopolymers in separation processes for recovery of biocompounds. It discusses biopolymer behavior during thermoplastic extrusion and the response of certain cereals and snacks to extrusion operating parameters. Finally, it reviews engineering aspects of biopolymers used as drying aids in spray-drying and freeze-drying of fruit juices and pulps and discusses biopolymers used as cryoprotectants in food freezing. A comprehensive source of scientific and technical information for those involved with process design and research and development, the book is also an ideal reference for academic researchers and undergraduate and postgraduate students.

The high market demand based on consumers' trust in fish as a healthy and nutritious food resource made fish processing a very dynamic industry, spurring many innovations in processing and packaging methods. Trends in Fish Processing Technologies not only reflects what is currently new in fish processing but also points out where things are heading in this area. This book provides an overview of the modern technologies employed by the industry. It details the advances in fish processing, including high pressure processing (HPP), pulsed electric field (PEF) treatment and minimally heat processing combined with microwave (MW) and radio-frequency (RF). It provides references to food safety management systems and food safety & quality indicators for processed fish in order to achieve an adequate level of protection. Quality aspects and molecular methods for the assessment of fish and fish products integrity are introduced. Fish products reformulation trends based on sustainability principles that tackles the reduction of salt content and the use of natural antimicrobials are presented. Innovative packaging solutions for fish products are explored, detailing intelligent packaging with freshness and time-temperature indicators, applications of modified packaging atmosphere, antimicrobial bio-nanocomposite packaging materials and biodegradable edible films used as primary fish packaging. In addition to covering the current advancements in fish processing the book discusses fraud, adulteration, fair trade practices, traceability and the need for added value, clean and sustainable processing in the fish chain.

The new volume looks at some important emerging food processing technologies in light of the demand for functional food products and high-value and nutritionally rich products.

Technologies for Value Addition in Food Products and Processes covers a selection of important recent developments in food processing that work to enrich or maintain nutritional value of

food products, including such applications as non-thermal plasma, refractance window drying, extrusion, enzyme immobilization, and dry fractionation. Dry fractionation, in particular, has emerged as a sustainable alternative to wet processes in last three decades for producing protein concentrates from legumes. Several chapters on fish processing cover both traditional knowledge and advances in fish processing technologies. A chapter on bioethanol production discusses the past and present status of the industry, focusing on economic feasibility and environmental viability. A chapter also discusses traditional fermentation process and nutritional aspects of ethnic foods followed by the Rabha-Hasong, Mishing and Karbi communities of Assam, India. With the contribution from experts in their respective fields, this volume provides new information on novel food processing technologies.

Extraction is an important operation in food engineering, enabling the recovery of valuable soluble components from raw materials. With increasing energy costs and environmental concerns, industry specialists are looking for improved techniques requiring less solvents and energy consumption. Enhancing Extraction Processes in the Food Industry is a Nanotechnology can be used to address challenges faced by the food and bioprocessing industries for developing and implementing improved or novel systems that can produce safer, nutritious, healthier, sustainable, and environmental-friendly food products. This book overviews the most recent advances made on the field of nanoscience and nanotechnology that significantly influenced the food industry. Advances in Processing Technologies for Bio-Based Nanosystems in Food provides a multidisciplinary review of the complex mechanisms involved in the research, development, production and legislation of food containing nanostructures systems. Features: Presents the most recent advances made in the field of nanoscience and nanotechnology as applied to the food industry Discusses innovative approaches and processing technologies Shows how nanotechnology can be used to produce safer, nutritious, healthier, sustainable and environmental-friendly food products Covers the complex mechanisms involved in the research, development, production and legislation of food containing nanostructures Selected examples of nanotechnology applications in food industry are shown, focusing on advanced aspects of food packaging, processing and preservation; followed by one contribution that presents the potential commercialization and the main challenges for scale-up. Comprised of 15 chapters, this book provides much-needed and up-to-date information on the use of emergent technologies in bio-based nanosystems for foods, and serves as an ideal reference for scientists, regulators, industrialists, and consumers that conduct research and development in the food processing industry.

Developing Solid Oral Dosage Forms: Pharmaceutical Theory and Practice, Second Edition illustrates how to develop high-quality, safe, and effective pharmaceutical products by discussing the latest techniques, tools, and scientific advances in preformulation investigation, formulation, process design, characterization, scale-up, and production operations. This book covers the essential principles of physical pharmacy, biopharmaceutics, and industrial pharmacy, and their application to the research and development process of oral dosage forms. Chapters have been added, combined, deleted, and completely revised as necessary to produce a comprehensive, well-organized, valuable reference for industry professionals and academics engaged in all aspects of the development process. New and important topics include spray drying, amorphous solid dispersion using hot-melt extrusion, modeling and simulation, bioequivalence of complex modified-released dosage forms, biowaivers, and much more. Written and edited by an international team of leading experts with experience and knowledge across industry, academia, and regulatory settings Includes new chapters covering the pharmaceutical applications of surface phenomenon, predictive biopharmaceutics and pharmacokinetics, the development of formulations for drug discovery support, and much more Presents new case studies throughout, and a section completely devoted to regulatory aspects, including global product regulation and international perspectives

Consumer demand for a year-round supply of seasonal produce and ready-made meals remains the driving force behind innovation in frozen food technology. Now in its second edition, Handbook of Frozen Food Processing and Packaging explores the art and science of frozen foods and assembles essential data and references relied upon by scientists in universities and research institutions. Highlights in the Second Edition include: Original chapters revised and updated with the latest developments New section on Emerging Technologies in Food Freezing, with chapters on ultrasound accelerated freezing, high-pressure shift freezing, electrostatic field-assisted food freezing, and antifreeze proteins New section on Trends in Frozen Food Packaging, with chapters on active packaging, intelligent packaging, vacuum packaging, and edible coatings and films and their applications on frozen foods This volume continues the tradition of the benchmark first edition, capturing the latest developments on the cutting edge of frozen food science. In addition to updated coverage of quality and safety issues and monitoring and measuring techniques, it highlights emerging technologies and trends, all in the format that made the previous edition so popular. It offers the tools needed to develop new and better products, keeping up with consumer demand for safe and convenient frozen foods.

The edible food packaging industry has experienced remarkable growth in recent years and will continue to impact the food market for quite some time going into the future. Edible Food Packaging: Materials and Processing Technologies provides a broad and comprehensive review on recent aspects related to edible packaging, from processing to potential applications, and covering the use of nanotechnology in edible packaging. The book's 14 chapters promote a comprehensive review on such subjects as materials used, their structure-function relationship, and new processing technologies for application and production of edible coatings and films. Specific topics include edible film and packaging using gum polysaccharides, protein-based films and coatings, and edible coatings and films from lipids, waxes, and resins. The book also reviews stability and application concerns, mass transfer measurement and modeling for designing protective edible films, and edible packaging as a vehicle for functional compounds. The authors explore antimicrobial edible packaging, nanotechnology in edible packaging, and nanostructured multilayers for food packaging by electrohydrodynamic processing. Additionally, they show how to evaluate the needs for edible packaging of respiring products and provide an overview of edible packaging for fruits, vegetables, and dairy products. Lastly, they examine edible coatings and films for meat, poultry, and fish.

Many factors are relevant in making the proper choice of food packaging material, including those related to shelf life and biodegradability. To meet these demands, new processing and preservation techniques have arisen, most notably modified atmosphere packaging (MAP) and active packaging (AP). Modified Atmosphere and Active Packaging Technologies With the advent of modern tools of molecular biology and genetic engineering and new skills in metabolic engineering and synthetic biology, fermentation technology for industrial applications has developed enormously in recent years. Reflecting these advances, Fermentation Processes Engineering in the Food Industry explores the state of the art of

Food Process Engineering and Technology, Third Edition combines scientific depth with practical usefulness, creating a tool for graduate students and practicing food engineers, technologists and researchers looking for the latest information on transformation and preservation processes and process control and plant hygiene topics. This fully updated edition provides recent research and developments in the area, features sections on elements of food plant design, an introductory section on the elements of classical fluid mechanics, a section on non-thermal processes, and recent technologies, such as freeze concentration, osmotic dehydration, and active packaging that are discussed in detail. Provides a strong emphasis on the relationship between engineering and product quality/safety Considers cost and environmental factors Presents a fully updated, adequate review of recent research and developments in the area Includes a new, full chapter on elements of food plant design Covers recent technologies, such as freeze concentration, osmotic dehydration, and active packaging that are discussed in detail

The processing of food is no longer simple or straightforward, but is now a highly inter-disciplinary science. A number of new techniques have developed to extend shelf-life, minimize risk, protect the environment, and improve functional, sensory, and nutritional properties. Since 1999 when the first edition of this book was published, it has facilitated readers' understanding of the methods, technology, and science involved in the manipulation of conventional and newer sophisticated food preservation methods. The Third Edition of the Handbook of Food Preservation provides a basic background in postharvest technology for foods of plant and animal origin, presenting preservation technology of minimally processed foods and hurdle technology or combined methods of preservation. Each chapter compiles the mode of food preservation, basic terminologies, and sequential steps of treatments, including types of equipment required. In addition, chapters present how preservation method affects the products, reaction kinetics and selected prediction models related to food stability, what conditions need be applied for best quality and safety, and applications of these preservation methods in different food products. This book emphasizes practical, cost-effective, and safe strategies for implementing preservation techniques for wide varieties of food products. Features: Includes extensive overview on the postharvest handling and treatments for foods of plants and animal origin Describes comprehensive preservation methods using chemicals and microbes, such as fermentation, antimicrobials, antioxidants, pH-lowering, and nitrite Explains comprehensive preservation by controlling of water, structure and atmosphere, such as water activity, glass transition, state diagram, drying, smoking, edible coating, encapsulation and controlled release Describes preservation methods using conventional heat and other forms of energy, such as microwave, ultrasound, ohmic heating, light, irradiation, pulsed electric field, high pressure, and magnetic field Revised, updated, and expanded with 18 new chapters, the Handbook of Food Preservation, Third Edition, remains the definitive resource on food preservation and is useful for practicing industrial and academic food scientists, technologists, and engineers.

With higher food quality in increasing demand by consumers, there is continuous pressure on food engineers to meet market needs. One of the critical challenges is to use modern technology and knowledge to develop new processes for improving food quality. Given the global food marketplace, there is also a greater need for a means of objectively clas

Encapsulation is a topic of interest across a wide range of scientific and industrial areas, from pharmaceuticals to food and agriculture, for the protection and controlled release of various substances during transportation, storage, and consumption. Since encapsulated materials can be protected from external conditions, encapsulation enhances their stability and maintains their viability. This book offers a comprehensive review of conventional and modern methods for encapsulation. It covers various thermal and nonthermal encapsulation methods applied across a number of industries, including freeze drying, spray drying, spray chilling and spray cooling, electrospinning/electrospraying, osmotic dehydration, extrusion, air-suspension coating, pan coating, and vacuum drying. The book presents basic fundamentals, principles, and applications of each method, enabling the reader to gain extended knowledge. The choice of the most suitable encapsulation technique is based on the raw materials, the required size, and the desirable characteristics of the final products.

While conventional technologies such as chilling and freezing are used to avoid deteriorative processes like autolytic and microbial spoilage of seafood, innovative technologies have also been developed as a response to economic and environmental demands. Innovative Technologies in Seafood Processing gives information on advances in chilling, freezing, thawing, and packaging of seafood and also updates knowledge of novel process technologies (high-pressure processing, irradiation, ultrasound, pulsed electric field, microwave and radio frequency, sous vide technology, novel thermal sterilization technologies, ozone and nanotechnological applications, and other innovative technologies such as cold plasma, ohmic heating, infrared heating supercritical carbon dioxide, and high-intensity pulsed light) for the seafood industry. Features ? Reviews novel process technologies applied in the seafood industry ? Highlights processing effects on product quality and safety of treated seafood ? Focuses on the development of safe and effective natural antimicrobials and additives ? Assesses alternative techniques to utilize fish discards and waste as high value products Further it highlights aspects related to quality of seafood treated with these innovative technologies, effect on food constituents, possible risk, security/safety both of seafood and consumers, the environmental impact, and the legislative aspects. The book also addresses the growing international environmental concern for fish discards and fish waste generated in the seafood processing industries by including a chapter, Advances in Discard and By-Products Processing, which assesses alternative techniques to utilize fish discards and waste as high value products. This book will be of value to researchers and technicians in the food technology area, especially those dealing with seafood.

Food Engineering Handbook: Food Process Engineering addresses the basic and applied principles of food engineering methods used in food processing operations around the

world. Combining theory with a practical, hands-on approach, this book examines the thermophysical properties and modeling of selected processes such as chilling, freezing, and dehydration. A complement to Food Engineering Handbook: Food Engineering Fundamentals, this text: Discusses size reduction, mixing, emulsion, and encapsulation Provides case studies of solid–liquid and supercritical fluid extraction Explores fermentation, enzymes, fluidized-bed drying, and more Presenting cutting-edge information on new and emerging food engineering processes, Food Engineering Handbook: Food Process Engineering is an essential reference on the modeling, quality, safety, and technologies associated with food processing operations today.

The final quality of a food product is impacted heavily by preservation technologies, such as chilling, freezing, and freeze-drying, as well as the numerous pretreatments that are routinely applied to foods. Adequate design and implementation of each of these treatments are critical to ensuring the integrity of the final food product, the productiv

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