[MOBI] Thermal Food Processing New Technologies And Quality Issues Contemporary Food Engineering

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Thermal Food Processing-Da-Wen Sun 2012-05-16 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 and pinpoints the trends in future research and development. Topics discussed include: Thermal properties of foods, including heat capacity, conductivity, diffusivity, and density Heat and mass transfer and related engineering principles, mechanisms, and models The development and application of deterministic heat transfer models for predicting internal product temperatures Modeling thermal processing using artificial neural networks (ANN) and computational fluid dynamics (CFD) Thermal processing of meat, poultry, fish, and dairy products; canned foods; ready meals; and vegetables The effect of ultrahigh temperature (UHT) treatment processing on milk, including the impact on nutrient composition, safety, and organoleptic aspects Ohmic, radio frequency (RF) dialectic, infrared, and pressure-assisted heating pH-assisted thermal processing In addition to updating all content, this second edition includes five new chapters: Thermal Effects in Food Microbiology, Modeling Thermal Microbial Inactivation Kinetics, Thermal Processing of Food and Fruit Juices, Aseptic Processing and Packaging, and Microwave Heating. The final chapter of the book examines systems used in the evaluation of thermal processes and the development of time temperature integrators (TTIs) to ensure the safety of thermally processed food. An up-to-date survey of essential techniques and the science behind them, this volume is a critical reference for food industry professionals.

Thermal Food Processing-Da-Wen Sun 2005-12-12 The challenge of maintaining both quality and safety in the thermal processing of foods results from the degradation of heat-sensitive quality attributes during processing. The editor of Thermal Food Processing: New Technologies and Quality Issues presents a comprehensive reference through authors that assist in meeting this challenge by explaining

Innovative Food Processing Technologies- 2020-08-18 Food process engineering, a branch of both food science and chemical engineering, has evolved over the years since its inception and still is a rapidly changing discipline. While traditionally the main objective of food process engineering was preservation and stabilization, the focus today has shifted to enhance health aspects, flavour and taste, nutrition, sustainable production, food security and also to ensure more diversity for the increasing demand of consumers. The food industry is becoming increasingly competitive and dynamic, and strives to develop high quality, freshly prepared food products. To achieve this objective, food
Emerging Thermal and Nonthermal Technologies in Food Processing—Prem Prakash Srivastav 2020 “This new volume, Emerging Thermal and Nonthermal Technologies in Food Processing, provides a comprehensive overview of thermal and nonthermal processing of food with new and innovative technologies. Recent innovations in thermal as well as nonthermal technologies, which are specifically applied for potable water and fluid foods (milk, juice, soups, etc.), are well documented for their high bioavailability of macro- and micronutrients and are very promising. This brings together valuable information on fluid and microbial characteristics and quality dynamics that facilitate the adoption of new technology for food processing. Some new technologies and methods covered include the application of microwaves in heating, drying, pasteurization, sterilization, blanching, baking, cooking, and thawing; microwave-assisted extraction of compounds; using low-electric fields; alternation of temperature and pressure of supercritical carbon dioxide; ultrasound-assisted osmotic dehydration; hydrodynamic cavitation; high-pressure processing; gamma-irradiation; and more. The nonthermal technologies discussed have been developed as an alternative to thermal processing while still meeting required safety or shelf-life demands and minimizing the effects on nutritional and quality attributes. With contributions from a broad range of leading researchers, this comprehensive volume will be a valuable reference and useful guide for students, educators, researchers, food processors, and industry personnel looking for up-to-date insights in the field. The authors believe that worldwide adoption of these novel technologies will benefit consumers in terms of enhanced food safety, labeling, nutritional security, and value-added products at reasonable costs”—

Advances in Thermal and Non-Thermal Food Preservation—Gaurav Tewari 2008-02-28 Advances in Thermal and Non-Thermal Food Preservation provides current, definitive and factual material written by experts on different thermal and non-thermal food preservation technologies. Emphasizing inactivation of microorganisms through the application of traditional as well as newer and novel techniques and their combinations, the book’s chapters cover: thermal food preservation techniques (e.g., retorting, UHT and aseptic processing), minimal thermal processing (e.g., sous-vide processing), and non-thermal food preservation techniques (e.g., high pressure processing and pulsed technologies). Editors Tewari and Juneja give special emphasis to the commercial aspects of non-conventional food preservation techniques. As the most comprehensive and contemporary resource of its kind, Advances in Thermal and Non-Thermal Food Preservation is the definitive standard in describing the inactivation of microorganisms through conventional and newer, more novel techniques.
Improving the thermal Processing of Foods-P Richardson 2004-07-16

The application of heat is both an important method of preserving foods and a means of developing texture, flavour and colour. It has long been recognised that thermal technologies must ensure the safety of food without compromising food quality. Improving the thermal processing of foods summarises key research both on improving particular thermal processing techniques and measuring their effectiveness. Part one examines how best to optimise thermal processes, with chapters addressing safety and quality, efficiency and productivity and the application of computational fluid dynamics. Part two focuses on developments in technologies for sterilisation and pasteurisation with chapters on modelling retort temperature control and developments in packaging, sous-vide and cook-chill processing. There are chapters covering continuous heat processing, including developments in tubular heat exchangers, aseptic processing and ohmic air impingement heating. The fourth part considers the validation of thermal processes, modelling heat penetration curves, using data loggers and temperature integrators and other new measuring techniques. The final group of chapters detail methods of analysing microbial inactivation in thermal processing and identifying and dealing with heat-resistant bacteria.

Emerging Technologies for Food Processing-Da-Wen Sun 2014-08-14

The second edition of Emerging Technologies in Food Processing presents essential, authoritative, and complete literature and research data from the past ten years. It is a complete resource offering the latest technological innovations in food processing today, and includes vital information in research and development for the food processing industry. Concisely explores prevailing developments in thermal technologies, summarises key research for improving food preservation techniques, analyses the effectiveness of methods used to enhance the quality of food.

Thermal Technologies in Food Processing-P Richardson 2001-05-08

Contributors mostly from European companies but also from some universities there and in the US describe the application of traditional retort technologies and continuous heat processes to preserve or alter food, and some of the new technologies that are emerging. They also look at measurement and control from such perspectives as measuring pressure and temperature in food process control, modelling and simulating thermal processes, and analysis and control for food quality. The new technologies they consider are radio frequency, microwave, infrared, instant and high-heat infusion, ohmic, and combined high-pressure thermal treatment. Cooling and freezing are not covered. c. Book News Inc.


Food processing is the step of the food chain that principally affects a food’s physical or biochemical properties, along with determining the safety and shelf life of the product. This book provides a comprehensive overview of innovations in non-thermal technologies specifically for fluid foods, recognized for their high bioavailability of macronutrients and micronutrients. Considerable resources and expertise has been devoted to the processing of safe and wholesome foods. Non-thermal technologies have been developed as an alternative to thermal processing, while still meeting required safety or shelf-life demands and minimising the effects on its nutritional and quality attributes. Examines non-thermal processing techniques specifically applied to fluid foods. Includes methods for mathematically evaluating each technique. Addresses global regulatory requirements for fluid foods. Provides recommendations and opportunities for various safety-related issues.

Conventional and Advanced Food Processing Technologies-Suvendu

Research sources to further research development. Presents current and thorough research results and critical reviews. Includes the most recent technologies used for shelf life extension, bioprocessing simulation and optimization.
Bhattacharya 2014-11-17 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.

**Thermal Processing of Foods** - K. P. Sandeep 2011-05-12 The food industry has utilized automated control systems for over a quarter of a century. However, the past decade has seen an increase in the use of more sophisticated software-driven, on-line control systems, especially in thermal processing unit operations. As these software-driven control systems have become more complex, the need to validate their operation has become more important. In addition to validating new control systems, some food companies have undertaken the more difficult task of validating legacy control systems that have been operating for a number of years on retorts or aseptic systems. Thermal Processing: Control and Automation presents an overview of various facets of thermal processing and packaging from industry, academic, and government representatives. The book contains information that will be valuable not only to a person interested in understanding the fundamental aspects of thermal processing (eg graduate students), but also to those involved in designing the processes (eg process specialists based in food manufacturing) and those who are involved in process filing with USDA or FDA. The book focuses on technical aspects, both from a thermal processing standpoint and from an automation and process control standpoint. Coverage includes established technologies such as retorting as well as emerging technologies such as continuous flow microwave processing. The book addresses both the theoretical and applied aspects of thermal processing, concluding with speculations on future trends and directions.

**Food Processing** - Kshirod Kumar Dash 2021-06-28 In food processing, thermal operations are the most common and conventional methods for obtaining and treating different products. This book covers basics and advances in thermal processing of food. These include drying processes, evaporation, blanching, deep fat frying, crystallization, extraction, and ohmic heating, in terms of food engineering and process design aspect. It further describes theoretical aspects, the basics of rate kinetics, and their application for the analysis of food quality indices including practical-oriented issues related to food technology. Traditional and new extraction techniques are also covered. Key features: Presents engineering focus on thermal food processing technologies. Discusses sub-classification for recent trends and relevant industry information/examples. Different current research-oriented results are included as a key parameter. Covers advances in drying, evaporation, blanching, crystallization, and ohmic heating. Includes mathematical modeling and numerical simulations. Food Processing: Advances in Thermal Technologies is aimed at graduate students and professionals in food engineering, food technology, and biological systems engineering.

**Nonthermal Processing Technologies for Food** - Howard Q. Zhang 2011-02-04 Nonthermal Processing Technologies for Food offers a comprehensive review of nonthermal processing technologies that are commercial, emerging or over the horizon. In addition to the broad coverage, leading experts in each technology serve as chapter authors to provide depth of coverage. Technologies covered include: physical processes, such as high pressure processing (HPP); electromagnetic processes, such as pulsed electric field (PEF), irradiation, and UV treatment; other nonthermal processes, such as ozone and chlorine dioxide gas phase treatment; and combination processes. Of special interest are chapters that focus on the "pathway to commercialization" for selected
Innovative Thermal and Non-Thermal Processing, Bioaccessibility and Bioavailability of Nutrients and Bioactive Compounds - Francisco J. Barba 2019-06-07 Innovative Thermal and Nonthermal Processing, Bioaccessibility and Bioavailability of Nutrients and Bioactive Compounds presents the implications of conventional and innovative processing on the nutritional and health aspects of food products. Chapters cover the relationship between gastronomic science, nutrition and food science in the development of healthy products, introduce the most commonly used conventional and innovative approaches to preserve foods and extract valuable compounds, describe how processing affects bioavailability and bioaccessibility of lipids, particularly fatty acids, protein, amino acids and carbohydrates, and discuss how processing affects bioavailability and bioaccessibility of minerals, water-soluble vitamins, and fat soluble vitamins. Final sections cover processing, bioavailability and bioaccessibility of bioactive compounds, describing how processing (conventional and non-conventional) is affecting to bioavailability and bioaccessibility of bioactive sulphur compounds, polyphenols, flavonoids, and bioactive peptides. Presents the implications of conventional and innovative processing on the nutritional and health aspects of food products. Introduces the most commonly used conventional and innovative approaches to preserve foods and extract valuable compounds. Explains how processing (conventional and non-conventional) affects the bioavailability and bioaccessibility of bioactive sulphur compounds, polyphenols, flavonoids and bioactive peptides.

Non-thermal Food Engineering Operations - Enrique Ortega-Rivas 2012-02-25 A number of food engineering operations, in which heat is not used as a preserving factor, have been employed and are applied for preparation (cleaning, sorting, etc.), conversion (milling, agglomeration, etc.) or preservation (irradiation, high pressure processing, pulsed electric fields, etc.) purposes in the food industry. This book presents a comprehensive treatise of all normally used food engineering operations that are carried out at room (or ambient) conditions, whether they are aimed at producing microbiologically safe foods with minimum alteration to sensory and nutritive properties, or they constitute routine preparative or transformation operations. The book is written for both undergraduate and graduate students, as well as for educators and practicing food process engineers. It reviews theoretical concepts, analyzes their use in operating variables of equipment, and discusses in detail different applications in diverse food processes.

Green Food Processing Techniques - Farid Chemat 2019-07-26 Green Food Processing Techniques: Preservation, Transformation and Extraction advances the ethics and practical objectives of "Green Food Processing" by offering a critical mass of research on a series of methodological and technological tools in innovative food processing techniques, along with their role in promoting the sustainable food industry. These techniques (such as microwave, ultrasound, pulse electric field, instant controlled pressure drop, supercritical fluid processing, extrusion...) lie on the frontier of food processing, food chemistry, and food microbiology, and are thus presented with tools to make preservation, transformation and extraction greener. The Food Industry constantly needs to reshape and innovate itself in order to achieve the social, financial and environmental demands of the 21st century. Green Food Processing can respond to these challenges by enhancing shelf life and the nutritional quality of food products, while at the same time reducing energy use and unit operations for processing, eliminating wastes and byproducts, reducing water use in harvesting, washing and processing, and using naturally derived ingredients.

Novel Food Processing Technologies - Gustavo V. Barbosa-Canovas 2004-11-30 Reflecting current trends in alternative food processing and preservation, this reference explores the most recent applications in pulsed electric field (PEF) and high-pressure technologies, food microbiology, and modern thermal and nonthermal operations to prevent the occurrence of food-borne pathogens, extend the shelf-life of foods, and improve...
Introduces the strategic concept of Green Food Processing to meet the challenges of the future of the food industry. Presents innovative techniques for green food processing that can be used in academia, and in industry in R&D and processing. Brings a multidisciplinary approach, with significant contributions from eminent scientists who are actively working on Green Food Processing techniques.

**Case Studies in Novel Food Processing Technologies** - C.J. Doona

Novel food processing technologies have significant potential to improve product quality and process efficiency. Commercialisation of new products and processes brings exciting opportunities and interesting challenges. Case studies in novel food processing technologies provide insightful, first-hand experiences of many pioneering experts involved in the development and commercialisation of foods produced by novel processing technologies. Part one presents case studies of commercial products preserved with the leading nonthermal technologies of high pressure processing and pulsed electric field processing. Part two broadens the case histories to include alternative novel techniques, such as dense phase carbon dioxide, ozone, ultrasonics, cool plasma, and infrared technologies, which are applied in food preservation sectors ranging from fresh produce to juices to disinfection. Part three covers novel food preservation techniques using natural antimicrobials, novel food packaging technologies, and oxygen depleted storage techniques. Part four contains case studies of innovations in retort technology, microwave heating, and predictive modelling that compare thermal versus non-thermal processes, and evaluate an accelerated 3-year challenge test. With its team of distinguished editors and international contributors, Case studies in novel food processing technologies is an essential reference for professionals in industry, academia, and government involved in all aspects of research, development, and commercialisation of novel food processing technologies. Provides insightful, first-hand experiences of many pioneering experts involved in the development and commercialisation of foods produced by novel processing technologies. Presents case studies of commercial products preserved with the leading nonthermal technologies of high pressure processing and pulsed electric field processing. Features alternative novel techniques, such as dense phase carbon dioxide, ozone, ultrasonics, cool plasma, and infrared technologies utilised in food preservation sectors.

**Progress in Food Preservation** - Rajeev Bhat

This volume presents a wide range of new approaches aimed at improving the safety and quality of food products and agricultural commodities. Each chapter provides in-depth information on new and emerging food preservation techniques including those relating to decontamination, drying and dehydration, packaging innovations and the use of botanicals as natural preservatives for fresh animal and plant products. The 28 chapters, contributed by an international team of experienced researchers, are presented in five sections, covering: Novel decontamination techniques, Novel preservation techniques, Active and atmospheric packaging, Food packaging, Mathematical modelling of food preservation processes, Natural preservatives. This title will be of great interest to food scientists and engineers based in food manufacturing and in research establishments. It will also be useful to advanced students of food science and technology.

**Innovative Technologies for Food Preservation** - Francisco J. Barba

Innovative Technologies for Food Preservation: Inactivation of Spoilage and Pathogenic Microorganisms covers the latest advances in non-thermal processing, including mechanical processes (such as high pressure processing, high pressure homogenization, high hydrodynamic pressure processing, pressurized fluids); electromagnetic technologies (like pulsed electric fields, high voltage electrical discharges, Ohmic heating, chemical electrolysis, microwaves, radiofrequency, cold plasma, UV-light); acoustic technologies (ultrasound, shockwaves); innovative chemical processing technologies (ozone, chlorine dioxide, electrolysis, oxidized water) and others like membrane filtration and dense phase CO2. The title also focuses on understanding the effects of such processing technologies on inactivation of the most relevant pathogenic and spoilage microorganisms to ensure food safety and stability. Over the course of the 20th century, the interest and demand for the development and application of new food preservation methods has increased significantly. The research in the last 50 years has produced various innovative food processing technologies and the use of new technologies for inactivation of spoilage and/or pathogenic microorganisms will depend on several factors. At this stage of development there is a need to better understand the mechanisms that govern microbial
inactivation as induced by new and innovative processing technologies, as well as suitable and effective conditions for inactivating the microorganism. Serves as a summary of relevant spoilage and pathogenic microorganisms for different foods as influenced by the application of innovative technologies for their preservation. Provides readers with an in-depth understanding on how effective innovative processing technologies are for controlling spoilage and pathogenic microorganisms in different foods. Integrates concepts in order to find the optimum conditions for microbial inactivation and preservation of major and minor food compounds.

**Essentials of Thermal Processing**-Gary Tucker 2021-05-04 ESSENTIALS OF THERMAL PROCESSING Explore this fully updated new edition of a practical reference on food preservation from two leading voices in the industry. Among all food preservation methods in use today, thermal processing remains the single most important technique used in the industry. The newly revised Second Edition of Essentials of Thermal Processing delivers a thorough reference on the science and applications of the thermal processing of a wide variety of food products. The book offers readers essential information on the preservation of food products by heat, including high-acid foods and low-acid sterilized foods requiring a full botulinum cook. The accomplished authors—note experts in their field—discuss all relevant manufacturing steps, from raw material microbiology through the various processing regimes, validation methods, packaging, incubation testing, and spoilage incidents. Two new chapters on temperature and heat distribution, as well as heat penetration of foods, are included. More worked and practical examples are found throughout the book as well. Readers will also benefit from the inclusion of: A thorough introduction to the microbiology of heat processed foods, food preservation techniques, low acid canned foods, and high acid foods. An exploration of acidified products, heat extended shelf-life chilled foods, and processing methods. Discussions of cooking and process optimization, process validation, and heat penetration and process calculations. An examination of cooling and water treatment, how to handle process deviations, and packaging options for heat preserved foods. Perfect for professionals working in the food processing and preservation industries, Essentials of Thermal Processing will also earn a place in the libraries of anyone seeking a one-stop reference on the subject of thermal processing for food products.

**Health and Safety Aspects of Food Processing Technologies**-Abdul Malik 2019-10-31 Food processing is expected to affect content, activity and bioavailability of nutrients; the health-promoting capacity of food products depends on their processing history. Traditional technologies, such as the use of antimicrobials and thermal processing, are efficient in increasing nutritional value to an extent, though they may not be effective at addressing food safety, particularly when it comes to maintaining the food’s molecular structure. Modern food processing plants improve the quality of life for people with allergies, diabetics, and others who cannot consume some common food elements. Food processing can also add extra nutrients, such as vitamins. Processed foods are often less susceptible to early spoilage than fresh foods and are better suited for long-distance transportation from the source to the consumer. However, food processing can also decrease the nutritional value of foods and introduce hazards not encountered with naturally occurring products. Processed foods often include food additives, such as flavourings and texture-enhancing agents, which may have little or no nutritive value, and may in fact be unhealthy. This book deals with the subject of food processing in a unique way, providing an overview not only of current techniques in food processing and preservation (i.e., dairy, meat, cereal, vegetables, fruits and juice processing, etc.) but also the health and safety aspects: food technologies that improve nutritional quality of foods, functional foods, and nanotechnology in the food and agriculture industry. The text also looks into the future by defining current bottlenecks and future research goals. This work will serve as a ready reference for the subject matter to students and researchers alike.

**Food Processing**-Stephanie Clark 2014-04-03 Food Processing: Principles and Applications second edition is the fully revised new edition of this best-selling food technology title. Advances in food processing continue to take place as food scientists and food engineers adapt to the challenges imposed by emerging pathogens, environmental concerns, shelf life, quality and safety, as well as the dietary needs and demands of humans. In addition to covering food processing principles that have long been essential to food quality and safety, this edition of Food Processing: Principles and
Applications, unlike the former edition, covers microbial/enzyme inactivation kinetics, alternative food processing technologies as well as environmental and sustainability issues currently facing the food processing industry. The book is divided into two sections, the first focusing on principles of food processing and handling, and the second on processing technologies and applications. As a hands-on guide to the essential processing principles and their applications, covering the theoretical and applied aspects of food processing in one accessible volume, this book is a valuable tool for food industry professionals across all manufacturing sectors, and serves as a relevant primary or supplemental text for students of food science.

**Food Processing** - Kshirod Kumar Dash 2021-06-28 Non-thermal operations in food processing are an alternative to thermal operations and similarly aimed at retaining the quality and organoleptic properties of food products. This volume covers different non-thermal processing technologies such as high-pressure processing, ultrasound, ohmic heating, pulse electric field, pulse light, membrane processing, cryogenic freezing, nanofiltration, and cold plasma processing technologies. The book focuses both on fundamentals and on recent advances in non-thermal food processing technologies. It also provides information with the description and results of research into new emerging technologies for both the academy and industry. Key features: Presents engineering focus on non-thermal food processing technologies. Discusses sub-classification for recent trends and relevant industry information/examples. Different current research-oriented results are included as a key parameter. Covers high-pressure processing, pulse electric field, pulse light technology, irradiation, and ultrasonic techniques. Includes mathematical modeling and numerical simulations.

**Food Processing** - Hosahalli S. Ramaswamy 2005-08-23 Food Processing: Principles and Applications is a comprehensive resource that explores the basic and applied aspects of food processing. It describes the physical, chemical, and microbiological basis for each method of preservation. Particular emphasis is placed on the application of three of the most universally used commercial processes: thermal processing, freezing, and dehydration. Thermal processing – perhaps the most widely used technology in the world – is examined in thorough discussions of the microbial basis of the process and on microbial destruction kinetics. Also described is the characterization of the heating behavior of foods and the equipment used for thermal processing. Low temperature preservation is also demonstrated with a focus on freezing. The fundamentals of the freezing process, and the techniques and equipment used in commercial freezing operations are also explained. The thermophysical properties and the modeling of freeze times are meticulously addressed in sequence. Aspects of dehydration are detailed from drying fundamentals to drying equipment, modeling, and storage changes. Ohmic Heating in Food Processing covers several aspects of Ohmic heating: science and engineering, chemistry and physics, biochemistry and nutrition, quality and safety, and development and technology, both basic and applied. It describes the importance of Ohmic technology and how to implement it in practice, addressing basic theory, principles, and applications. Divided into nine sections, this volume covers the basics of Ohmic heating, including a historic overview and fundamental principles; electrical conductivity, its importance, factors that influence it, and data modeling; biological effects of electricity on foods and food components, including microorganisms, enzymes, proteins, carbohydrates, and fats; and Ohmic heating behavior and design parameters. The book also deals with issues in Ohmic heating equipment, Ohmic heating modeling issues, and process validation issues. The authors discuss various applications of Ohmic heating applied to different classes of foods, such as muscle foods (meat, poultry, and fish), dairy products, fruits, and vegetables. They also examine commercially successful applications of food products processed by Ohmic heating and considers applications of Ohmic heating where preservation is not the main focus, for example, blanching, Ohmic thawing, and the potential for Ohmic heating for long-duration space missions.

**Ohmic Heating in Food Processing** - Hosahalli S. Ramaswamy 2014-02-14 Ohmic heating provides rapid and uniform heating, resulting in less thermal damage than conventional heating and allowing manufacturers to obtain high-quality products with minimum sensorial, nutritional, and structural changes.
Food Processing Technology - P.J. Fellows 2009-07-28 Widely regarded as a standard work in its field, this book introduces the range of processing techniques that are used in food manufacturing. It explains the principles of each process, the processing equipment used, operating conditions and the effects of processing on micro-organisms that contaminate foods, the biochemical properties of foods and their sensory and nutritional qualities. The book begins with an overview of important basic concepts. It describes unit operations that take place at ambient temperature or involve minimum heating of foods. Subsequent chapters examine operations that heat foods to preserve them or alter their eating quality, and explore operations that remove heat from foods to extend their shelf life with minimal changes in nutritional quality or sensory characteristics. Finally, the book reviews post-processing operations, including packaging and distribution logistics. The third edition has been substantially rewritten, updated and extended to include the many developments in food technology that have taken place since the second edition was published in 2000. Nearly all unit operations have undergone significant developments, and these are reflected in the large amount of additional material in each chapter. In particular, advances in microprocessor control of equipment, ‘minimal’ processing technologies, genetic modification of foods, functional foods, developments in ‘active’ or ‘intelligent’ packaging, and storage and distribution logistics are described. Developments in technologies that relate to cost savings, environmental improvement or enhanced product quality are highlighted. Additionally, sections in each chapter on the impact of processing on food-borne micro-organisms are included for the first time.

Food Safety Engineering - Ali Demirci 2020-05-28 Food Safety Engineering is the first reference work to provide up-to-date coverage of the advanced technologies and strategies for the engineering of safe foods. Researchers, laboratory staff and food industry professionals with an interest in food engineering safety will find a singular source containing all of the needed information required to understand this rapidly advancing topic. The text lays a solid foundation for solving microbial food safety problems, developing advanced thermal and non-thermal technologies, designing food safety preventive control processes and sustainable operation of the food safety preventive control processes. The first section of chapters presents a comprehensive overview of food microbiology from foodborne pathogens to detection methods. The next section focuses on preventative practices, detailing all of the major manufacturing processes assuring the safety of foods including Good Manufacturing Practices (GMP), Hazard Analysis and Critical Control Points (HACCP), Hazard Analysis and Risk-Based Preventive Controls (HARPC), food traceability, and recalls. Further sections provide insights into plant layout and equipment design, and maintenance. Modeling and process design are covered in depth. Conventional and novel preventive controls for food safety include the current and emerging food processing technologies. Further sections focus on such important aspects as aseptic packaging and post-packaging technologies. With its comprehensive scope of up-to-date technologies and manufacturing processes, this is a useful and first-of-its kind text for the next generation food safety engineering professionals.

Engineering Aspects of Thermal Food Processing - Ricardo Simpson 2009-06-22 Access the Latest Advances in Food Quality Optimization and Safety Assurance Thermal processing has undergone a remarkable amount of research throughout the past decade, indicating that the process not only remains viable, but that it is also expanding around the world. An organized exploration of new developments in academic and current food industry practices, Engineering Aspects of Thermal Food Processing presents groundbreaking advances in the physical and engineering aspects of thermal food processing, paying particular attention to modeling, simulation, optimization, online control, and automation. Divided into Four Cohesive Sections Under the editorial guidance of a leading thermal processing authority, the book first covers the fundamentals and new processes in the thermal processing industry, including new packaging materials like retortable pouches. The second section moves on to mathematical modeling and simulation, which also addresses emerging
preservation technology such as ohmic heating. The third section of the book is devoted to optimization, recognizing that mathematical optimization is the key ingredient for computing optimal operating policies and building advanced decision support systems. This section discusses processes like thermal sterilization, microwave processing, and in-line aseptic processing as well as an analysis of plant production productivity. The final section examines online control and automation describing a practical and efficient strategy for on-line correction of thermal process deviations during retort sterilization of canned foods. Concluding with expert analysis and discussion of the manufacturers’ businesses in today’s competitive marketplace, Engineering Aspects of Thermal Food Processing explores the entire processing line from modeling through optimization. It effectively assists manufacturers in maintaining a seamless workflow while lowering their bottom lines.

**Handbook of Food Processing** Theodoros Varzakas 2015-10-22 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

**Technologies for Value Addition in Food Products and Processes** Sankar Chandra Deka 2019-10-28 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.

**Electron Beam Pasteurization and Complementary Food Processing Technologies** Suresh Pillai 2014-11-28 Food safety is a constant challenge for the food industry, and food irradiation technology has developed significantly since its introduction, moving from isotope irradiation to the use of electron beam technology. Electron Beam Pasteurization and Complementary Food Processing Technologies explores the application of electron beam pasteurization in conjunction with other food processing technologies to improve the safety and quality of food. Part one provides an overview of the issues surrounding electron beam pasteurization in food processing. Part two looks at different thermal and non-thermal food processing technologies that complement irradiation. Finally, a case study section on the commercial applications of e-beam processing provides examples from industry.

**Functional Foods and Dietary Supplements** Athapol Noomhorm 2014-03-11 Functional foods are foods which contain bioactive components, either from plant or animal sources, which can have health benefits for the consumer over and above their nutritional value. Foods which have antioxidant or cancer-combating components are in high demand from health conscious consumers: much has been made of the health-giving qualities of fruits and vegetables in particular. Conversely, foods which have been processed are suffering an image crisis, with many consumers indiscriminately assuming that any kind of processing robs food of its “natural goodness”. To date, there has been little examination of the actual effects - whether positive or negative - of various types of food processing upon functional foods. This book highlights the effects of food processing on the active ingredients of a wide range of functional food materials, with a particular focus on foods of Asian origin. Asian foods, particularly herbs, are becoming increasingly accepted and demanded globally, with many Western
consumers starting to recognize and seek out their health-giving properties. This book focuses on the extraction of ingredients which from materials which in the West are seen as “alternative” - such as flour from soybeans instead of wheat, or bran and starch from rice – but which have long histories in Asian cultures. It also highlight the incorporation of those bioactive compounds in foods and the enhancement of their bioavailability. Functional Foods and Dietary Supplements: Processing Effects and Health Benefits will be required reading for those working in companies, research institutions and universities that are active in the areas of food processing and agri-food environment. Food scientists and engineers will value the new data and research findings contained in the book, while environmentalists, food regulatory agencies and other food industry personnel involved in functional food production or development will find it a very useful source of information.

The Microwave Processing of Foods - Marc Regier 2016-11-01 The Microwave Processing of Foods, Second Edition, has been updated and extended to include the many developments that have taken place over the past 10 years. Including new chapters on microwave assisted frying, microwave assisted microbial inactivation, microwave assisted disinfestation, this book continues to provide the basic principles for microwave technology, while also presenting current and emerging research trends for future use development. Led by an international team of experts, this book will serve as a practical guide for those interested in applying microwave technology. Provides thoroughly up-to-date information on the basics of microwaves and microwave heating Discusses the main factors for the successful application of microwaves and the main problems that may arise Includes current and potential future applications for real-world application as well as new research and advances Includes new chapters on microwave-assisted frying, microbial inactivation, and disinfestation

Concepts of Small-scale Food Processing - Donald G. Mercer 2021-02-08 Providing detailed information on key areas of post-harvest technologies, this book is written with small-scale processors and entrepreneurs in food processing, who have no formal training in Food Science or Food Engineering, in mind. Uniquely, it will review the hands-on aspects of food processing from a largely non-academic viewpoint. It is written in non-technical language and covers everything from the basic science of why food is processed to a description of the main methods used. Coverage includes all current technologies that are used at the small-scale such as why food is processed, the historical development of food processing, background skills, heating and cooling in food processing, thermal processing basics and specialised calculations, drying food materials, statistical manufacturing control and sugar solution calculations in beverage making The target audience for this book is vastly under-served with appropriate information and the abundant use of photographs, showing the various concepts described in the text, makes this book appealing to those required to understand their food process operations.

Innovative Technologies in Seafood Processing - Yesim Ozogul 2019-09-04 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 Process Engineering and Technology** - Zeki Berk 2018-02-13 
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

**Food Processing Handbook** - James G. Brennan 2012-05-07 
The second edition of the Food Processing Handbook presents a comprehensive review of technologies, procedures and innovations in food processing, stressing topics vital to the food industry today and pinpointing the trends in future research and development. Focusing on the technology involved, this handbook describes the principles and the equipment used as well as the changes - physical, chemical, microbiological and organoleptic - that occur during food preservation. In so doing, the text covers in detail such techniques as post-harvest handling, thermal processing, evaporation and dehydration, freezing, irradiation, high-pressure processing, emerging technologies and packaging. Separation and conversion operations widely used in the food industry are also covered as are the processes of baking, extrusion and frying. In addition, it addresses current concerns about the safety of processed foods (including HACCP systems, traceability and hygienic design of plant) and control of food processes, as well as the impact of processing on the environment, water and waste treatment, lean manufacturing and the roles of nanotechnology and fermentation in food processing. This two-volume set is a must-have for scientists and engineers involved in food manufacture, research and development in both industry and academia, as well as students of food-related topics at undergraduate and postgraduate levels. From Reviews on the First Edition: "This work should become a standard text for students of food technology, and is worthy of a place on the bookshelf of anybody involved in the production of foods." Journal of Dairy Technology, August 2008 "This work will serve well as an excellent course resource or reference as it has well-written explanations for those new to the field and detailed equations for those needing greater depth." CHOICE, September 2006

**Heat Transfer in Food Processing** - S. Yanniotis 2007 
Heat Transfer is important in food processing. This edited book presents a review of ongoing activities in a broad perspective.

**Food Processing Operations Modeling** - Joseph M. Irudayaraj 2001-02-27 
A comprehensive survey of thermal processing and modelling techniques in food process engineering. It combines theory and practice to solve actual problems in the food processing industry - emphasizing heat and mass transfer, fluid flow, electromagnetics, stochastic processes, and neural network analysis in food systems. There are specific case stu