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: Advances in Non-Thermal Technologies is aimed at graduate students, professionals in food engineering, food technology, and biological systems engineering. Part of the IFT (Institute of Food Technologists) series, this book discusses multiphysics modeling and its application in the development, optimization, and scale-up of emerging food processing technologies. The book covers recent research outcomes to demonstrate process efficiency and the impact on scalability, safety, and quality, and technologies including High Pressure Processing, High Pressure Thermal Sterilization, Radiofrequency, Ultrasound, Ultraviolet, and Pulsed Electric Fields Processing. Ideal for food and process engineers, food technologists, equipment designers, microbiologists, and research and development personnel, this book covers the importance and the methods for applying multiphysics modeling for the design, development, and application of these technologies. Recent developments have enabled the production of in-pack processed foods with improved sensory quality as well as new types of heat-preserved products packaged in innovative containers. This book reviews these advances in packaging formats and processing technologies and their application to produce higher quality, safer foods. Opening chapters cover innovative can designs and non-traditional packaging formats, such as retort pouches. The second part of the book reviews the developments in processing and process control technology required by newer types of packaging. Part three addresses the safety of in-pack processed foods, including concerns over pathogens and hazardous compounds in processed foods. The book concludes with chapters on novel methods to optimise the quality of particular types of in-pack processed foods such as fruit and vegetables, meat, poultry and fish products. In-pack processed foods: improving quality is a valuable reference for professionals involved in the manufacture of this important group of food products and those researching in this area. Reviews advances in packaging
formats and processing technologies Covers innovative can designs and non-traditional packaging formats Examines the safety of in-pack processed foods, including concerns over pathogens

By the turn of the century, consumers have been more demanding, sophisticated and discretionary. They will want much safer, high-quality, and convenience foods. Most foods are perishable and will deteriorate unless preserved. Agents involved in food spoilage include physical reactions, chemical reactions, enzymes, and microorganisms. Control of microbial and enzymatic activity can extend the shelf life of foods for use in the future. Thermal and non-thermal technologies are both used in the processing and preservation of foods. The food processor will need to get the best from his existing processing technology in addition to looking for newer ones. New and alternative food processing methods &/or novel combinations of existing methods are continually being investigated by the industry in pursuit of producing better quality foods more economically. Innovative and novel concepts are continuously evolving in every area of food processing. Recently, awareness about good nutrition coupled with the increasing demand for fresher tasting food have paved the way for new food processing technologies. Novel Food Processing covers a range of food processing treatments that meet current demands for added value and guaranteed safety. 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 processing methods such as microwave (MW), radiofrequency (RF), infrared (IR) heating, pressure-assisted thermal sterilization (PATS), and sous-vide processing (SVP), as well as non-thermal methods such as high hydrostatic pressure (HHP) processing, irradiation, ultrasound, pulsed electric field (PEF), and pulsed light (PL) technologies to prevent the occurrence of food-borne pathogens, extend the shelf-life of foods, and improve the safety, quality, and nutritional value of various food products. Covering significant advances have been made in the research, development, and application of these technologies in food processing; this book is intended for students as well as professionals and researchers interested in both food and environmental issues applicable to sustainable food production.

This book will review the current status of the agriculture and agri-food sector in regard to green processing and provide strategies that can be used by the sector to enhance the use of environmentally-friendly technologies for production, processing. The book will look at the full spectrum from farm to fork beginning with chapters on life cycle analysis and environmental impact assessment of different agri-food sectors. This will be followed by reviews of current and novel on-farm practices that are more environmentally-friendly, technologies for food processing that reduce chemical and energy use and emissions as well as novel analytical techniques for R&D and QA which reduce solvent, chemical and energy consumption. Technologies for waste treatment, "reducing, reusing, recycling", and better water and energy stewardship will be reviewed. In addition, the last section of the book will attempt to look at technologies and processes that reduce the generation of process-induced toxins (e.g., trans fats, acrylamide, D-amino acids) and will address consumer perceptions about current and emerging technologies available to tackle these processing and environmental issues.

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.

The emergence of ‘minimal’ processing techniques, which have a limited impact on a food’s nutritional and sensory properties, has been a major new development in the food industry. This book provides an authoritative review of the range of minimal techniques currently available, their applications and safety and quality issues. Reviews the range of minimal processing techniques, their advantages and disadvantages and their use in food production Discusses the range of thermal technologies, such as infrared heating, ohmic heating, and dielectric methods, including the use of microwaves Presents alternatives to thermal processing, ranging from irradiation to high pressure processing and the use of pulsed electric fields.

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.

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 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.

With such advantages as more rapid heating and preservation of sensory and nutritional quality, microwave processing has proved a versatile technology. This important book reviews the wealth of recent research on how this technology affects particular foods and how it can be optimised for the food industry. Part one discusses current research on how microwaves interact with the dielectric properties of foods and reviews its effects on nutritional and sensory quality. Building on this foundation, the range of applications of microwave processing from baking and drying to blanching, thawing and tempering are reviewed. It also looks at packaging issues. The final part of the book covers the key area of process measurement and control to ensure more uniform heating of food products. With its distinguished editors and international team of contributors, The microwave processing of foods is a standard reference for all those wishing to maximise the benefits of this important technology. Reviews recent research on how microwave processing affects particular foods Discusses how this technology can be optimised for the food industry An assortment of examples are used to illustrate key points

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.
Every food manufacturing and processing operation has inherent risks affecting the safety of food products. Non-thermally processed foods are not exempt of those risks. This chapter provides the reader with an overview of various non-thermal technologies (e.g. irradiation, pulsed electric fields, high hydrostatic pressure, intense pulsed lights, membrane filtration and hurdle technology). Each of these technologies has specific critical process parameters that must be monitored as part of critical control points. In-depth understanding of these technologies is the key while considering their implementation. The main challenge on non-thermal processes is standardization when compared to thermal treatments. Non-thermal processes seem to be product specific resulting in additional research work to define process parameters. Nevertheless, a significant amount of research data are available and specific process conditions can be found in the literature.


Thermal technologies have long been at the heart of food processing. The application of heat is both an important method of preserving foods and a means of developing texture, flavour and colour. An essential issue for food manufacturers is the effective application of thermal technologies to achieve these objectives without damaging other desirable sensory and nutritional qualities in a food product. Edited by a leading authority in the field, and with a distinguished international team of contributors, Thermal technologies in food processing addresses this major issue. Part one of the collection begins with reviews of conventional retort and continuous heat technologies. Part two then looks at the key issues of effective measurement and control in ensuring that a thermal process is effective whilst minimising any undesirable changes in a food. There are chapters on temperature and pressure measurement, validation of heat processes, modelling and simulation of thermal processes, and the measurement and control of changes in a food during thermal processing. The final part of the book looks at emerging thermal technologies which becoming more widely used in the food industry. There are chapters on radio frequency heating, microwave processing, infrared heating, instant and high-heat infusion, and ohmic heating A final chapter considers how thermal processing may be combined with high pressure processing in producing safe, minimally-processed food products. Thermal technologies in food processing provides food manufacturers and researchers with an authoritative review of thermal processing and food quality.

It has long been recognised that thermal technologies must ensure the safety of food without compromising food quality. Food Processing Advances in Non-Thermal Technologies CRC Press

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. It covers the latest advances in non-thermal processing including
high pressure, pulsed electric fields, radiofrequency, high intensity pulsed light, ultrasound, irradiation, and addresses the newest hurdles in technology where extensive research has been carried out. Provides an extensive list of 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

Antonio Morata holds patents in wine technology specifically related to aging on lees, grape skin separation and brettanomyces analysis. All other Topic Editors declare no competing interests with regard to the Research Topic subject.

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

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.

Radio-Frequency Heating in Food Processing: Principles and Applications covers the fundamentals of radio-frequency (RF) heating and the use of RF-heating technologies in modern food processing, preservation, and related industries. Focusing on industrial and lab-scale applications where RF heating has been employed successfully or reported to have

The first edition of Food processing technology was quickly adopted as the standard text by many food science and technology courses. This completely revised and updated third edition consolidates the position of this textbook as the best single-volume introduction to food manufacturing technologies available. This edition has been updated and extended to include the many developments that have taken place since the second edition was published. In particular, advances in microprocessor control of equipment, ‘minimal’ processing technologies, functional foods, developments in ‘active’ or ‘intelligent’ packaging, and storage and distribution logistics are described. 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. 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
Novel Food Fermentation Technologies provides a comprehensive overview of innovations in food fermentation technologies and their application. Current novel technologies for microbial culture production and preservation are covered in detail, as are fermentation techniques for the production of bioactives from various food matrices, including food processing by-products and waste. Readers are provided with a close look at thermal and non-thermal technologies applicable to fermented food products. The text covers immobilization, microencapsulation technologies and novel preservation techniques for cultures in fermentation. In-depth studies of high pressure processing, pulsed electric field, power ultrasound and gamma irradiation in fermentation are provided in addition to novel thermal and non-thermal technologies and process analytical techniques. A wide variety of fermented products are covered, including meat, marine-based, grain-based, dairy and vegetable-based products. Current technologies for extraction of bioactives are examined, as are current innovations in fermented food packaging. Readers are presented with current and future challenges in food fermentation as well. As a comprehensive reference for food fermentation, this work provides up-to-date insights into emerging fermentation technologies which facilitate the processing of wholesome and safe food products.

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 cleanliness. 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.

The dairy industry usually adopts conventional methods of processing various milk-based food products, which can destroy nutrients and minimize organoleptic qualities. An alternative approach for this is the non-conventional method of non-thermal processing techniques. Not only does this enhance the nutritional profile of the various processed products, but increases the consumer acceptability. There are some emerging non-thermal processing techniques such as pulsed light, cold plasma, high pressure processing, ultrasonic, UV pasteurization, or ozone treatments, which can be successfully employed in dairy processing industries to enhance product acceptability, safety, and quality aspects. Non-Thermal Processing Technologies for the Dairy Industry describes several emerging non-thermal processing techniques that can be specially employed for the dairy processing industry. The book narrates the benefits of using pulsed light, cold plasma, high pressure and ultrasonic during processing of various dairy products. Key Features: Addresses techniques used for extraction of functional food components from various dairy products by using super critical CO2 extraction technology. Explains application of ozone and cold plasma technology for treating
dairy processing waste waters with efficient recycling aspects. Discusses the importance of using biopreservatives in shelf life extension of several dairy food products. Portrays scope and significant importance of adopting UV pasteurization in processing market milk along with safety and environmental impacts over processing. This book solves the issue of waste generation in dairy industries and further advises recovery of such waste for efficient recycling process. In addition to being useful for dairy technologists, it is a great source for academic scholars and students looking to gain knowledge and excel in the non-thermal processing area.

Innovation and Future Trends in Food Manufacturing and Supply Chain Technologies focuses on emerging and future trends in food manufacturing and supply chain technologies, examining the drivers of change and innovation in the food industry and the current and future ways of addressing issues such as energy reduction and rising costs in food manufacture. Part One looks at innovation in the food supply chain, while Part Two covers emerging technologies in food processing and packaging. Subsequent sections explore innovative food preservation technologies in themed chapters and sustainability and future research needs in food manufacturing. Addresses issues such as energy reduction and rising costs in food manufacture. Assesses current supply chain technologies and the emerging advancements in the field, including key chapters on food processing technologies. Covers the complete food manufacturing scale, compiling significant research from academics and important industrial figures.

This new volume 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 volume 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.

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.
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 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. This book presents the latest developments in the area of non-thermal preservation of foods and covers various topics such as high-pressure processing, pulsed electric field processing, pulsed light processing, ozone processing, electron beam processing, pulsed magnetic field, ultrasonics, and plasma processing. Non-thermal Processing of Foods discusses the use of non-thermal processing on commodities such as fruits and vegetables, cereal products, meat, fish and poultry, and milk and milk products. Features: Provides latest information regarding the use of non-thermal processing of food products Provides information about most of the non-thermal technologies available for food processing Covers food products such as fruits and vegetables, cereal products, meat, fish and poultry, and milk and milk products Discusses the packaging requirements for foods processed with non-
thermal techniques The effects of non-thermal processing on vital food components, enzymes and microorganisms is also discussed. Safety aspects and packaging requirements for non-thermal processed foods are also presented. Rounding out coverage of this technology are chapters that cover commercialization, regulatory issues and consumer acceptance of foods processed with non-thermal techniques. The future trends of non-thermal processing are also investigated. Food scientists and food engineers, food regulatory agencies, food industry personnel and academia (including graduate students) will find valuable information in this book. Food product developers and food processors will also benefit from this book.

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

Advances in thermal and non-thermal food processing aims to discuss emerging trends based on the future scope and challenges and to explain uncertain challenges in food processing. In thermal processing different operations in food engineering namely advance drying methods, evaporation, extrusion cooking, different extraction techniques, crystallizations are covered in terms food engineering and process modeling aspect. For non-thermal processing, high pressure processing, ultrasound, ohmic heating, pulse electric field, pulse light technology, osmotic dehydration and so forth are discussed. Relevant mathematical modeling and numerical simulations has been included in every chapter. Features: Presents engineering focus on thermal and non-thermal food processing technologies. Discusses sub-classification for recent trends and relevant industry information/examples. Describes advances in drying, evaporation, blanching, crystallization and ohmic heating. Covers high-pressure processing, pulse electric...
field, pulse light technology, irradiation, and ultrasonic techniques. Includes mathematical modeling and numerical simulations. The book is aimed at graduate students, professionals in food engineering and food technology, biological systems engineering. 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 emerging technologies where a pathway exists or is clearly identified. These chapters provide examples and case studies of how new and nonthermal processing technologies may be commercialized. Overall, the book provides systematic knowledge to industrial readers, with numerous examples of process design to serve as a reference book. Researchers, professors and upper level students will also find the book a valuable text on the subject. Natural foods, like fruits and vegetables, represent the simplest form of functional foods and provide excellent sources of functional compounds. Maximizing opportunities to make use of and incorporate these compounds requires special processing. Fortunately, technologies available to produce food with enhanced active compounds have advanced significantly over the last few years. This book covers the fundamentals as well as the innovations made during the last few years on the emerging technologies used in the development of food with bioactive compounds.