

Nonthermal Processing Technologies For Food

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Non-thermal Processing of Foods - O. P. Chauhan
2019-01-10

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 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

Food Processing for Increased Quality and Consumption - Alexandru Mihai Grumezescu

2018-04-08

Food Processing for Increased Quality and Consumption, Volume 18 in the Handbook of Food Bioengineering series, offers an updated perspective on the novel technologies utilized in food processing. This resource highlights their impact on health, industry and food bioengineering, also emphasizing the newest aspects of investigated technologies and specific food products through recently developed processing methods. As processed foods are more frequently consumed, there is increased demand to produce foods that attract people

based on individual preferences, such as taste, texture or nutritional value. This book provides advantageous tools that improve food quality, preservation and aesthetics. Examines different frying techniques, dielectric defrosting, high pressure processing, and more Provides techniques to improve the quality and sensory aspects of foods Includes processing techniques for meat, fish, fruit, alcohol, yogurt and whey Outlines techniques for fresh, cured and frozen foods Presents processing methods to improve the nutritional value of foods
Non-Thermal Processing Technologies for the Dairy Industry - Taylor & Francis Group
2021-11-09
This book 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.

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 an

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.

Food Processing -

Kshirod Kumar Dash

2021-08-09

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.
Validation of Food Preservation Processes based on Novel Technologies - Tatiana Koutchma 2021-11-26
Validation of Food Preservation Processes based on Novel Technologies discusses and recommends activities for bench top, pilot, prototype and commercial high hydrostatic pressure (HPP) and ultraviolet (UV) systems validation. The book explores issues of equipment scalability, selection of microorganisms of concern and their surrogates, validation and verification of critical processing conditions, treatment uniformity, process control and instrumentation. Topics are discussed in order to facilitate HPP and UV technologies implementation, thus mitigating risks during

production and processing. Other sections deal with the selection of suitable surrogates that can be used in validation studies and procedures for their selection. The book also encloses case studies of validation of UV and HPP systems for pathogen reduction in juice. Edited by the main experts in the field of non-thermal food processing, this title is a guide for food process developers from starting to final point of the development and validation. Brings science-based validation practices for food processes using novel technologies Guides food process developers from starting point to final point of development and validation Explains objectives of the process development on each stage, including in-lab, pilot scale and

commercialization

High Pressure Processing of Food - V.M.

Balasubramaniam

2016-01-28

High pressure processing technology has been adopted worldwide at the industrial level to preserve a wide variety of food products without using heat or chemical preservatives. High Pressure Processing: Technology Principles and Applications will review the basic technology principles and process parameters that govern microbial safety and product quality, an essential requirement for industrial application. This book will be of interest to scientists in the food industry, in particular to those involved in the processing of products such as meat, fish, fruits, and vegetables. The book will be equally important to food

microbiologists and processing specialists in both the government and food industry.

Moreover, it will be a valuable reference for authorities involved in the import and export of high pressure treated food products. Finally, this update on the science and technology of high pressure processing will be helpful to all academic, industrial, local, and state educators in their educational efforts, as well as a great resource for graduate students interested in learning about state-of-the-art technology in food engineering.

Non-thermal Processing Technologies for the Dairy Industry - M.

Selvamuthukumar 2021

"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. 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"--
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.

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.

Herbs, Spices and

Medicinal Plants -
Mohammad B. Hossain
2020-10-05

The latest research on the health benefits and optimal processing technologies of herbs and spices. This book provides a comprehensive overview of the health benefits, analytical techniques used, and effects of processing upon the physicochemical properties of herbs and spices. Presented in three parts, it opens with a section on the technological and health benefits of herbs and spices. The second part reviews the effect of classical and novel processing techniques on the properties of herbs/spices. The third section examines extraction techniques and analytical methodologies used for herbs and spices. Filled with contributions from experts in academia and industry, Herbs, Spices

and Medicinal Plants: Processing, Health Benefits and Safety offers chapters covering thermal and non-thermal processing of herbs and spices, recent developments in high-quality drying of herbs and spices, conventional and novel techniques for extracting bioactive compounds from herbs and spices, and approaches to analytical techniques. It also examines purification and isolation techniques for enriching bioactive phytochemicals, medicinal properties of herbs and spices, synergy in whole-plant medicine, potential applications of polyphenols from herbs and spices in dairy products, biotic and abiotic safety concerns, and adverse human health effects and regulation of metal contaminants in terrestrial plant-derived food and

phytopharmaceuticals. Covers the emerging health benefits of herbs and spices, including their use as anti-diabetics, anti-inflammatory, and anti-oxidants Reviews the effect of classical and novel processing techniques on the properties of herbs and spices Features informed perspectives from noted academics and professionals in the industry Part of Wiley's new IFST Advances in Food Science series Herbs, Spices and Medicinal Plants is an important book for companies, research institutions, and universities active in the areas of food processing and the agri-food environment. It will appeal to food scientists and engineers, environmentalists, and food regulatory agencies.

Packaging for Nonthermal Processing of Food -

Melvin A. Pascall

2018-02-19

A comprehensive review of the many new developments in the growing food processing and packaging field Revised and updated for the first time in a decade, this book discusses packaging implications for recent nonthermal processing technologies and mild food preservation such as high pressure processing, irradiation, pulsed electric fields, microwave sterilization, and other hurdle technologies. It reviews typical nonthermal processes, the characteristics of food products after nonthermal treatments, and packaging parameters to preserve the quality and enhance the safety of the products. In addition, the critical role played by packaging

materials during the development of a new nonthermal processed product, and how the package is used to make the product attractive to consumers, is discussed. Packaging for Nonthermal Processing of Food, Second Edition provides up to date assessments of consumer attitudes to nonthermal processes and novel packaging (both in the U.S. and Europe). It offers a brand new chapter covering smart packaging, including thermal, microbial, chemical, and light sensing biosensors, radio frequency identification systems, and self-heating and cooling packaging. There is also a new chapter providing an overview of packaging laws and regulations in the United States and Europe. Covers the packaging types required for all major nonthermal

technologies, including high pressure processing, pulsed electric field, irradiation, ohmic heating, and others. Features a brand new chapter on smart packaging, including biosensors (thermal-, microbial-, chemical- and light-sensing), radio frequency identification systems, and self-heating and cooling packaging. Additional chapters look at the current regulatory scene in the U.S. and Europe, as well as consumer attitudes to these novel technologies. Editors and contributors bring a valuable mix of industry and research experience. Packaging for Nonthermal Processing of Food, Second Edition offers many benefits to the food industry by providing practical information on the relationship between new processes and packaging

materials, to academia as a source of fundamental knowledge about packaging science, and to regulatory agencies as an avenue for acquiring a deeper understanding of the packaging requirements for new processes.

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

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
Emerging Thermal and Nonthermal Technologies in Food Processing - Taylor & Francis Group
2021-12-13

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.
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.

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: Advances in Non-Thermal Technologies is aimed at graduate students, professionals in food engineering, food technology, and biological systems engineering.

Improving Food Quality with Novel Food Processing Technologies

- Özlem Tokuşoğlu
2014-12-01

Consumers around the world have become better educated and more demanding in their identification and purchase of quality health-promoting foods; therefore the food industry requires innovative technologies to provide their clientele with safe and stable foods that meet safety regulations .

Improving Food Quality with Novel Food Processing Technologies

details novel processing technologies including high pressure processing (HPP) and pulsed electrical fields (PEFs) that can improve the quality of food from functionality, chemistry/microbiology, bioactive quantity, and shelf-life standpoints. The authors discuss how to improve food functionality with high hydrostatic pressure (HHP) and PEFs. They focus on improving the quality and retaining bioactive constituents of fruits and vegetables and improving the quality of dairy, egg, meat, and seafood products with HHP. Broad in scope, the book also reviews the modeling and simulations of HHP inactivation of microorganisms and the relative effects of HHP processing on food allergies and intolerances. It then discusses improving food

functionality with PEF processes in dairy and egg products, fruit juices, and wine. A chapter attending to industrial applications of HHP and PEF systems and potential commercial quality and shelf life of food products concludes this discussion. During the past decade, novel processing technologies including HHP, ultrasound, PEF, and advanced heating technologies containing microwave, ohmic heating, and radio frequency have frequently been applied in the processing of foods and beverages. Successful research and identification of economic benefits, including energy and water conservation as well as demonstrated safety and fresh-like quality attributes will improve consumer perception of nonthermal

technologies and result in further development by the food industry around the world. In an in-depth exploration of these novel technologies, the book gives you the skills for product development and improvement.

Novel Thermal and Non-Thermal Technologies for Fluid Foods - PJ Cullen
2011-08-17

Chapter 1. Status and Trends of Novel Thermal and Non-Thermal Technologies for Fluid Foods -- Chapter 2. Fluid Dynamics in Novel Thermal and Non-Thermal Processes -- Chapter 3. Fluid Rheology in Novel Thermal and Non-Thermal Processes --Chapter 4. Pulsed Electric Field Processing of Fluid Foods -- Chapter 5. High Pressure Processing of Fluid Foods -- Chapter 6. Ultrasound Processing of Fluid Foods -- Chapter 7. Irradiation of Fluid Foods --

Chapter 8. Ultraviolet and Pulsed Light Processing of Fluid Foods -- Chapter 9. Ozone Processing of Fluid Foods -- Chapter 10. Dense Phase Carbon Dioxide Processing of Fluid Foods -- Chapter 11. Ohmic Heating of Fluid Foods -- Chapter 12. Microwave Heating of Fluid Foods -- Chapter 13. Infrared Heating of Fluid Foods -- Chapter 14. Modelling the Kinetics of Microbial and Quality Attributes of Fluid Food during Novel Thermal and Non-Thermal Processes -- Chapter 15. Regulatory and Legislative issues for Thermal and Non-Thermal Technologies: An EU Pers ...

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.

Innovative Food Processing Technologies

- Kai Knoerzer

2016-06-29

Innovative Food Processing Technologies: Extraction, Separation, Component Modification and Process

Intensification focuses on advances in new and novel non-thermal processing technologies which allow food producers to modify and process food with minimal damage to the foodstuffs. The book is highly focused on the application of new and novel technologies, beginning with an introductory chapter, and then detailing technologies which can be used to extract food

components. Further sections on the use of technologies to modify the structure of food and the separation of food components are also included, with a final section focusing on process intensification and enhancement.

Provides information on a variety of food processing technologies. Focuses on advances in new and novel non-thermal processing technologies which allow food producers to modify and process food with minimal damage to the foodstuffs. Presents a strong focus on the application of technologies in a variety of situations. Created by editors who have a background in both the industry and academia.

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

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 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.

Non-Thermal Processing Technologies for the Grain Industry - M. Selvamuthukumar
2021-08-19

Food can rapidly spoil due to growth of microorganisms, and traditional methods of food preservation such as drying, canning, salting, curing, and chemical preservation can affect the quality of the food. Nowadays, various non-thermal processing techniques can be employed in grain processing industries to combat this. They include pulsed electric field processing, high pressure processing, ultrasonic processing, cold plasma processing, and more. Such techniques will satisfy consumer demand for delivering wholesome food products to the

market. *Non-Thermal Processing Technologies for the Grain Industry* addresses these many new non-thermal food processing techniques that are used during grain processing and minimize microbial contamination and spoilage. Key Features: Explains the mechanism involved in application of cold plasma techniques for grain processing, and its strategy for inactivation of microbes by using this technique Deals with the effect of incorporation of electric pulses on quality aspects of various grain based beverage products. Details the innovative high pressure processing techniques used for extraction of antioxidant from food grains Explores the safety issues and applications of non-thermal food processing

techniques This book will benefit food scientists, food process engineers, academicians, students, as well as anyone else in the food industry by providing in-depth knowledge and emerging trends about non-thermal processing techniques in various grain-based food processing industries.

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. 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

Food Safety Management -

Olga Martín-Belloso

2013-11-01
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.

Case Studies in Novel Food Processing Technologies

- C J Doona
2010-10-28

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 provides 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 disinfestation. 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

Nonthermal Processing in Agri-Food-Bio Sciences - Anet Režek Jambrak 2022-09-26

This book addresses important questions on the legislation, regulations, sustainability, technology transfer, safety of biomaterials and mechanism of action of nonthermal processing on the molecular level of biomaterials and its impact on health. The chapters take an interdisciplinary approach that is of interest to specialists from engineering, physics, chemistry, agriculture, life sciences and beyond, with a focus on further development of existing and new applications of nonthermal processing

and their combination with other methods in the processing of biomaterials, agriculture, biotechnology and the re-use of waste and by-products. *Nonthermal Processing in Agri-Food-Bio Sciences: Sustainability and Future Goals* aims to boost further developments and applications of nonthermal technologies to develop healthier products, to ensure consumer approval for these innovative technologies and to improve the sustainability of biomaterials production. The industrial application of nonthermal processing has led to an increase in innovative value products and the overall improvement of production capacity. Nonthermal processes use less energy and

chemicals, reduce processing times, have less environmental impact, produce less waste, and have the potential for industrial scale-up and a return-on-investment in under 5 years. According to The United Nations and the 2030 Agenda for Sustainable Development, 17 goals should be incorporated within development projects, and researchers are starting to use novel techniques to meet them. In covering the fundamental engineering theories underlying nonthermal processing, this book will aid in this mission. The book overviews the advantages and disadvantages of novel technologies, over to sustainability goals to correct steps for the scale-up and return on investment. The book includes the chemistry and physics of nonthermal processing

technologies, dedicated to specialists and researchers from a wide range of subject areas. Interdisciplinary scientists and engineers, sustainability experts can use this text to aid in their work in green technologies.

Pulsed Electric Fields Technology for the Food Industry - Javier Raso-Pueyo 2010-04-30

Many novel technologies have been proposed in the attempt to improve existing food processing methods. Among emerging nonthermal technologies, high intensity pulsed electric fields (PEF) is appealing due to its short treatment times and reduced heating effects. This book presents information accumulated on PEF during the last 15 years by experienced microbiologists, biochemists, food technologists, and

electrical and food engineers.

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 manufacturers are today presented with a growing array of new technologies that have the potential to improve, or replace, conventional processing technologies, to deliver higher quality and better consumer targeted food products, which meet many, if not all, of the demands of the modern consumer. These new, or innovative, technologies are in various stages of development, including some still at the R&D stage, and others that have been commercialised as alternatives to conventional processing technologies. Food process engineering comprises a series of unit operations traditionally applied in the food industry. One major component of these operations relates to the application of heat,

directly or indirectly, to provide foods free from pathogenic microorganisms, but also to enhance or intensify other processes, such as extraction, separation or modification of components. The last three decades have also witnessed the advent and adaptation of several operations, processes, and techniques aimed at producing high quality foods, with minimum alteration of sensory and nutritive properties. Some of these innovative technologies have significantly reduced the thermal component in food processing, offering alternative nonthermal methods. Food Processing Technologies: A Comprehensive Review covers the latest advances in innovative and nonthermal processing, such as high pressure, pulsed electric fields,

radiofrequency, high intensity pulsed light, ultrasound, irradiation and new hurdle technology. Each section will have an introductory article covering the basic principles and applications of each technology, and in-depth articles covering the currently available equipment (and/or the current state of development), food quality and safety, application to various sectors, food laws and regulations, consumer acceptance, advancements and future scope. It will also contain case studies and examples to illustrate state-of-the-art applications. Each section will serve as an excellent reference to food industry professionals involved in the processing of a wide range of food categories, e.g., meat, seafood, beverage,

dairy, eggs, fruits and vegetable products, spices, herbs among others.

Innovative Technologies for Food Preservation -

Francisco J. Barba

2017-09-21

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

Food Formulation -

Shivani Pathania
2021-03-15

Reviews innovative processing techniques and recent developments in food formulation, identification, and utilization of functional ingredients. Food Formulation: Novel Ingredients and Processing Techniques is a comprehensive and up-to-date account of novel food ingredients and new processing techniques used in advanced commercial food formulations. This unique volume will help students and industry professionals alike in understanding the current trends, emerging technologies, and their impact on the food formulation techniques. Contributions from leading academic and

industrial experts provide readers with informed and relevant insights on using the latest technologies and production processes for new product development and reformulations. The text first describes the basis of a food formulation, including smart protein and starch ingredients, healthy ingredients such as salt and sugar replacers, and interactions within the food components. Emphasizing operational principles, the book reviews state-of-the-art 3D printing technology, encapsulation and a range of emerging technologies including high pressure, pulsed electric field, ultrasound and supercritical fluid extraction. The final chapters discuss recent developments and trends in food formulation, from foods that target allergies and

intolerance, to prebiotic and probiotic food formulation designed to improve gut health. A much-needed reference on novel sourcing of food ingredients, processing technologies, and application, this book: Explores new food ingredients as well as impact of processing on ingredient interactions Describes new techniques that improve the flavor and acceptability of functional food ingredients Reviews mathematical tools used for recipe formulation, process control and consumer studies Includes regulations and legislations around tailor-made food products Food Formulation: Novel Ingredients and Processing Techniques is an invaluable resource for students, educators, researchers, food technologists, and

professionals, engineers and scientists across the food industry.

Non-thermal Technologies

- Fabiano Andre Narciso Fernandes 2021-11-15
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.

Packaging for Nonthermal Processing of Food -

Melvin A. Pascall
2018-02-20

A comprehensive review of the many new developments in the growing food processing and packaging field Revised and updated for the first time in a decade, this book discusses packaging implications for recent nonthermal processing technologies and mild

food preservation such as high pressure processing, irradiation, pulsed electric fields, microwave sterilization, and other hurdle technologies. It reviews typical nonthermal processes, the characteristics of food products after nonthermal treatments, and packaging parameters to preserve the quality and enhance the safety of the products. In addition, the critical role played by packaging materials during the development of a new nonthermal processed product, and how the package is used to make the product attractive to consumers, is discussed. Packaging for Nonthermal Processing of Food, Second Edition provides up to date assessments of consumer attitudes to nonthermal processes and novel packaging (both in the U.S. and Europe). It

offers a brand new chapter covering smart packaging, including thermal, microbial, chemical, and light sensing biosensors, radio frequency identification systems, and self-heating and cooling packaging. There is also a new chapter providing an overview of packaging laws and regulations in the United States and Europe. Covers the packaging types required for all major nonthermal technologies, including high pressure processing, pulsed electric field, irradiation, ohmic heating, and others. Features a brand new chapter on smart packaging, including biosensors (thermal-, microbial-, chemical- and light-sensing), radio frequency identification systems, and self-heating and cooling packaging

Additional chapters look at the current regulatory scene in the U.S. and Europe, as well as consumer attitudes to these novel technologies. Editors and contributors bring a valuable mix of industry and research experience. Packaging for Nonthermal Processing of Food, Second Edition offers many benefits to the food industry by providing practical information on the relationship between new processes and packaging materials, to academia as a source of fundamental knowledge about packaging science, and to regulatory agencies as an avenue for acquiring a deeper understanding of the packaging requirements for new processes. Non-Thermal Processing Technologies for the Fruit and Vegetable Industry - M. Selvamuthukumar 2022 "With thermal processing

affecting food quality, diminishing nutrients, and altering texture of the products, food companies are looking to non-thermal processes to deliver quality wholesome food. This book covers non-thermal techniques to preserve fruits & vegetables"--

Ultraviolet Light in Food Technology - Tatiana Koutchma 2019-05-20

UV light is one of a number of emerging non-thermal food processing technologies that can be used in a broad range of applications producing food products with longer shelf-life, more safe, and with higher nutritional quality. The new edition of **Ultraviolet Light in Food Technology: Principles and Applications** will present recent understanding of the fundamentals of UV light along with new applied

knowledge that has accumulated during the 7 years since the first edition published in 2009. The new edition of the book will have 11 chapters including 2 new chapters--on chemical destruction with UV light and food plant safety--along with 6 chapters greatly expanded and updated.

Thermal Technologies in Food Processing - P Richardson 2001-04-24

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 are 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.

Nonthermal Preservation of Foods - Enrique Palou
1997-10-06

"Written by four experts actively researching alternatives to conventional thermal methods in food

preservation. Presents information on traditional and emerging nonthermal food processing technologies in a convenient, single-source volume--offering an incisive view of the latest experimental results, state-of-the-art applications, and new developments in food preservation technology.

Furnishes a thorough review of nonthermal techniques such as high hydrostatic pressure, pulsed electric fields, oscillating magnetic fields, light pulses, ionizing irradiation, the use of chemicals and bacteriocins as preservation aids, and combined methods/hurdle technology."