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Irradiation of Food and Packaging

Recent Developments



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Irradiation Of Food And Packaging Recent Developments

Enrique Ortega-Rivas



Irradiation Of Food And Packaging Recent Developments:

Irradiation of Food and Packaging American Chemical Society. Meeting, 2004 This book presents extensive coverage of irradiated foods and food products contaminated with food borne pathogens and the effects on irradiation and packaging materials and additives It also shows the effects ionizing radiation has on improved functional components in fresh fruits and vegetables

Packaging for Nonthermal Processing of Food Jung H. Han, 2008-02-28 A number of novel thermal and nonthermal processing methods are in active research and development in industry academic and government laboratories A key step that needs to be addressed is how to best package commodities processed by high pressure pulsed electric fields UV irradiation microwave or radio frequency heating bioactive coating packaging or the treatment with probiotics to best preserve the benefits of improved product quality imparted by these emerging preservation technologies Packaging for Nonthermal Processing of Food reviews typical nonthermal processes the characteristics of food products after nonthermal treatments and packaging parameters to preserve the quality and enhance the food safety of the products In addition the critical role of information carried by packaging materials to make a new product produced by a novel process attractive to consumers is discussed Packaging for Nonthermal Processing of Food offers many benefits to industry for providing the practical information on the relationship between new processes and packaging materials to academia for constructing the fundamental knowledge and to regulatory agencies for acquiring deeper understanding on the packaging requirements for new processes

Packaging for Nonthermal Processing of Food Melvin A. Pascall, Jung H. Han, 2018-06-18 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

Processing Effects on Safety and Quality of Foods Enrique Ortega-Rivas,2009-10-08 Covers a Host of Groundbreaking Techniques Thermal processing is known to effectively control microbial populations in food but the procedure also has a downside it can break down the biochemical composition of foods resulting in a marked loss of sensory and nutritional quality Processing Effects on Safety and Quality of Foods delineates three dec **Non-thermal Food Engineering Operations** Enrique Ortega-Rivas,2012-02-25 This book describes the advent and adaptation of food processing operations processes and techniques which reduce even eliminate the thermal component resulting in microbiologically safe foods with minimum alteration in sensory and nutritive properties *Dairy Processing: Advanced Research to Applications* Jagrani Minj,Aparna Sudhakaran V,Anuradha Kumari,2020-04-10 This book focuses on advanced research and technologies in dairy processing one of the most important branches of the food industry It addresses various topics ranging from the basics of dairy technology to the opportunities and challenges in the industry Following an introduction to dairy processing the book takes readers through various aspects of dairy engineering such as dairy based peptides novel milk products and bio fortification It also describes the essential role of microorganisms in the industry and ways to detect them as well as the use of prebiotics and food safety Lastly the book examines the challenges faced especially in terms of maintaining quality across the supply chain Covering all significant areas of dairy science and processing this interesting and informative book is a valuable resource for post graduate students research scholars and industry experts

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

Emerging Food Packaging Technologies Kit L

Yam,Dong Sun Lee,2012-03-15 The successful employment of food packaging can greatly improve product safety and quality making the area a key concern to the food processing industry Emerging food packaging technologies reviews advances in packaging materials the design and implementation of smart packaging techniques and developments in response to growing concerns about packaging sustainability Part one of Emerging food packaging technologies focuses on developments in active packaging reviewing controlled release packaging active antimicrobials and nanocomposites in packaging and edible chitosan coatings Part two goes on to consider intelligent packaging and how advances in the consumer packaging interface can improve food safety and quality Developments in packaging material are analysed in part three with nanocomposites emerging coating technologies light protective and non thermal process packaging discussed alongside a consideration of the safety of plastics as food packaging materials Finally part four explores the use of eco design life cycle assessment and the utilisation of bio based polymers in the production of smarter environmentally compatible packaging With its distinguished editors and international team of expert contributors Emerging food packaging technologies is an indispensable reference work for all those responsible for the design production and use of food and beverage packaging as well as a key source for researchers in this area Reviews advances in packaging materials the design and implementation of smart packaging techniques and developments in response to growing concerns about packaging sustainability Considers intelligent packaging and how advances in the consumer packaging interface can improve food safety and quality Examines developments in packaging materials nanocomposites emerging coating technologies light protective and non thermal process packaging and the safety of plastics as food packaging materials

Antimicrobial Food Packaging Jorge

Barros-Velazquez,2015-12-27 Antimicrobial Food Packaging takes an interdisciplinary approach to provide a complete and robust understanding of packaging from some of the most well known international experts This practical reference provides basic information and practical applications for the potential uses of various films in food packaging describes the different types of microbial targets fungal bacteria etc and focuses on the applicability of techniques to industry Tactics on the monitoring of microbial activity that use antimicrobial packaging detection of food borne pathogens the use of biosensors and testing antimicrobial susceptibility are also included along with food safety and good manufacturing practices The book aims to curtail the development of microbiological contamination of food through anti microbial packaging to improve the safety in the food supply chain Presents the science behind anti microbial packaging and films reflecting advancements in chemistry microbiology and food science Includes the most up to date information on regulatory aspects consumer acceptance research

trends cost analysis risk analysis and quality control Discusses the uses of natural and unnatural compounds for food safety and defense

Microbial Decontamination in the Food Industry Ali Demirci, Michael O Ngadi, 2012-06-26 The problem of creating microbiologically safe food with an acceptable shelf life and quality for the consumer is a constant challenge for the food industry Microbial decontamination in the food industry provides a comprehensive guide to the decontamination problems faced by the industry and the current and emerging methods being used to solve them Part one deals with various food commodities such as fresh produce meats seafood nuts juices and dairy products and provides background on contamination routes and outbreaks as well as proposed processing methods for each commodity Part two goes on to review current and emerging non chemical and non thermal decontamination methods such as high hydrostatic pressure pulsed electric fields irradiation power ultrasound and non thermal plasma Thermal methods such as microwave radio frequency and infrared heating and food surface pasteurization are also explored in detail Chemical decontamination methods with ozone chlorine dioxide electrolyzed oxidizing water organic acids and dense phase CO₂ are discussed in part three Finally part four focuses on current and emerging packaging technologies and post packaging decontamination With its distinguished editors and international team of expert contributors Microbial decontamination in the food industry is an indispensable guide for all food industry professionals involved in the design or use of novel food decontamination techniques as well as any academics researching or teaching this important subject Provides a comprehensive guide to the decontamination problems faced by the industry and outlines the current and emerging methods being used to solve them Details backgrounds on contamination routes and outbreaks as well as proposed processing methods for various commodities including fresh produce meats seafood nuts juices and dairy products Sections focus on emerging non chemical and non thermal decontamination methods current thermal methods chemical decontamination methods and current and emerging packaging technologies and post packaging decontamination

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 Three Volume Set 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

Handbook of Food Safety Engineering Da-Wen Sun, 2011-11-03 This book presents a comprehensive and substantial overview of the emerging field of food safety engineering bringing together in one volume the four essential components of food safety the fundamentals of microbial growth food safety detection techniques microbial inactivation techniques food safety management systems Written by a team of highly active international experts with both academic and professional credentials the book is divided into five parts Part I details the principles of food safety including microbial growth and modelling Part II addresses novel and rapid food safety detection methods Parts III and IV look at various traditional and novel thermal and non thermal processing techniques for microbial inactivation Part V concludes the book with an overview of the major international food safety management systems such as GMP SSOP HACCP and ISO22000

Lipid Peroxidation Research Mahmoud Ahmed Mansour, 2020-01-22 Lipid peroxidation is the major molecular mechanism that induces oxidative damage to cell structures and is also involved in the toxicity process that leads to cell death Lipid peroxidation is a chain reaction initiated by the hydrogen abstraction or addition of an oxygen radical resulting in the oxidative damage of polyunsaturated fatty acids PUFA PUFAs are more sensitive than saturated fatty acids because of the presence of a double bond adjacent to a methylene group that makes the methylene C H bond weaker and therefore the hydrogen is more susceptible to abstraction This leaves an unpaired electron on the carbon forming a carbon centered radical which is stabilized by a molecular rearrangement of the double bonds to form a conjugated diene which then combines with oxygen to form a peroxy radical In pathological situations the reactive oxygen and nitrogen species are generated at higher than normal rates and as a consequence lipid peroxidation occurs with deficiency of endogenous

antioxidants as alpha tocopherol deficiency or reduced glutathione In addition to containing high concentrations of PUFAs and transition metals biological membranes of cells and organelles are constantly being subjected to various types of damage This book presents systematic and comprehensive reviews on free radicals and their involvement in lipid peroxidation with special emphasis on their important role in different diseases *Safety Analysis of Foods of Animal Origin* Leo M.L. Nollet,Fidel Toldra,2016-04-19 We cannot control how every chef packer and food handler might safeguard or compromise the purity of our food but thanks to the tools developed through physics and nanotech and the scientific rigor of modern chemistry food industry and government safety regulators should never need to plead ignorance when it comes to safety assurance Compiled **In-Pack Processed Foods** P Richardson,2008-06-13 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 **Nonthermal Processing Technologies for Food** Howard Q. Zhang,Gustavo V. Barbosa-Cánovas,V. M. Balasubramaniam,C. Patrick Dunne,Daniel F. Farkas,James T. C. Yuan,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 *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.

Decontamination of Fresh and Minimally Processed Produce Vicente M. Gómez-López, 2012-05-01. Attempts to provide safer and higher quality fresh and minimally processed produce have given rise to a wide variety of decontamination methods, each of which have been extensively researched in recent years. *Decontamination of Fresh and Minimally Processed Produce* is the first book to provide a systematic view of the different types of decontaminants for fresh and minimally processed produce. By describing the different effects (microbiological, sensory, nutritional, and toxicological) of decontamination treatments, a team of internationally respected authors reveals not only the impact of decontaminants on food safety but also on microbial spoilage, vegetable physiology, sensory quality, nutritional and phytochemical content, and shelf life. Regulatory and toxicological issues are also addressed. The book first examines how produce becomes contaminated, the surface characteristics of produce related to bacterial attachment, biofilm formation, and resistance, and sublethal damage and its implications for decontamination. After reviewing how produce is washed and minimally processed, the various decontamination methods are then explored in depth in terms of definition, generation devices, microbial inactivation mechanisms, and effects on food safety. Decontaminants covered include chlorine, electrolyzed oxidizing water, chlorine dioxide, ozone, hydrogen peroxide, peroxyacetic acid, essential oils, and edible films and coatings. Other decontamination methods addressed are biological strategies (bacteriophages, protective cultures, bacteriocins, and quorum sensing) and physical methods (mild heat, continuous UV light, ionizing radiation, and various combinations of these methods through hurdle technology). The book concludes with descriptions of post decontamination methods related to storage, such as modified atmosphere packaging, the cold chain, and modeling tools for predicting microbial growth and inactivation. The many methods and effects of decontamination are detailed, enabling industry professionals to understand the available state of the art, methods, and select the most suitable approach for their purposes. The book serves as a compendium of information for food researchers and students of pre and postharvest technology, food microbiology, and food technology in general. The structure of the book allows easy comparisons among methods and searching information by microorganism, produce, and quality traits.

Microbial Safety of Fresh Produce Xueting Fan, Brendan A. Niemira, Christopher J. Doona, Florence E. Feeherry, Robert B. Gravani, 2009-10-06. *Microbial Safety of Fresh Produce* covers all aspects of produce safety including pathogen ecology, agro

management pre harvest and post harvest interventions and adverse economic impacts of outbreaks This most recent edition to the IFT Press book series examines the current state of the problems associated with fresh produce by reviewing the recent high profile outbreaks associated with fresh produce including the possible internalization of pathogens by plant tissues and understanding how human pathogens survive and multiply in water soils and fresh fruits and vegetables

Polymer Additive Analytics Jan C. J. Bart, 2006

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