

modified atmosphere packaging for fresh cut fruits and vegetables

[#modified atmosphere packaging](#) [#fresh cut fruits preservation](#) [#vegetable shelf life extension](#) [#MAP for produce](#) [#food preservation technology](#)

Explore how modified atmosphere packaging (MAP) is revolutionizing the preservation of fresh cut fruits and vegetables. This advanced packaging technique carefully controls the gas composition around produce, significantly extending shelf life and maintaining quality, freshness, and nutritional value from farm to consumer, reducing waste and enhancing market reach.

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Modified Atmosphere Packaging for Fresh-Cut Fruits and Vegetables

Modified Atmosphere Packaging for Fresh-cut Fruits and Vegetables provides comprehensive coverage of all aspects of modern MAP technologies for fresh-cut fruits and vegetables. Coverage begins with the general MAP concept and application by introducing the concept of MAP, how MAP works for fresh-cut produce and the benefits and shortfalls of MAP in its application. The book then discusses the basic aspects of MAP – packaging materials and machinery. In these sections, the book addresses not only the general information about MAP materials, but also supplies examples to introduce the new packaging films and their successful application in produce and fresh-cut fruits and vegetables. Unique chapters and sections in the book include relevant patents for MAP, commercial practices and MAP packaging machinery. Generally, packaging machinery is only included in books specifically covering packaging engineering. Coverage of this important aspect is included in the book since fresh-cut manufacturers spend much more time in the day-to-day operations on packaging machinery and systems as compared to packaging film materials. In the final section, Modified Atmosphere Packaging for Fresh-cut Fruits and Vegetables highlights the latest developments in the packaging industry and how they could impact the fresh-cut industry.

Controlled and Modified Atmospheres for Fresh and Fresh-Cut Produce

Controlled and Modified Atmospheres for Fresh and Fresh-Cut Produce is the ultimate reference book of CA/MA recommendations for selected commodities. It includes the basic knowledge of physiology and technologies to the current application of recommended CA/MAP conditions for fresh and fresh-cut fruits and vegetables. For each commodity, a summary with requirements and recommendations is presented. The book is divided into three parts, with each focusing on different aspects of CA/MA, including fundamental topics on the physiological and quality effects of CA and MAP for fresh and fresh-cut fruits and vegetables, optimal CA/MAP conditions and recommendations, and optimal conditions for fresh-cut fruits and vegetables. Provides guidelines and recommendations of CA/MAP for the fresh produce industry Illustrates the benefits and defects caused by CA/MA in full color Brings more than 54 fruits and vegetables and their respective summary with the requirements and recommendations of CA/MA conditions Includes the optimal CA/MAP conditions and recommendations for selected fresh fruits and vegetables

Fresh-Cut Fruits and Vegetables

Fresh-Cut Fruits and Vegetables: Technologies and Mechanisms for Safety Control covers conventional and emerging technologies in one single source to help industry professionals maintain and enhance

nutritional and sensorial quality of fresh-cut fruits and vegetables from a quality and safety perspective. The book provides available literature on different approaches used in fresh-cut processing to ensure safety and quality. It discusses techniques with the aim of preserving quality and safety in sometimes unpredictable environments. Sanitizers, antioxidants, texturizers, natural additives, fortificants, probiotics, edible coatings, active and intelligent packaging are all presented. Both advantages and potential consequences are included to ensure microbial safety, shelf-life stability and preservation of organoleptic and nutritional quality. Industry researchers, professionals and students will all find this resource essential to understand the feasibility and operability of these techniques in modern-day processing to make informed choices. Provides current information on microbial infection, quality preservation, and technology with in-depth discussions on safety mechanisms Presents ways to avoid residue avoidance in packaging and preservation Includes quality issues of microbial degradation and presents solutions for pre-harvest management

Principles and Applications of Modified Atmosphere Packaging of Foods

Modified atmosphere packaging may be defined as an active packaging method in which an altered atmosphere is created in the headspace that retards chemical deterioration while simultaneously retarding growth of spoilage organisms. Shelf lives of perishable products, such as dairy products, meat, poultry, fish, fruits and vegetables, and bakery items are limited by biochemical changes in the product catalysed by exposure to the normal atmosphere (21 % oxygen, 78% nitrogen and less than 0.1 % carbon dioxide) and growth of spoilage organisms. Modification of the atmosphere within a package containing these products helps to better maintain the quality of the food under longer storage conditions and retards the growth of undesirable organisms. Of course, deterioration is also slowed by chilling, which is required for the transport to market of highly perishable items like meat, poultry and fish that would either spoil or have the potential for contamination by certain food pathogens. Chilling plus a modification of the atmosphere optimizes the keeping quality of food. Modification of the atmosphere has been known for over a century as a means of food preservation and has become a very popular means of food preservation in the latter part of the 20th century. Modified atmosphere packaging (MAP) is practised extensively in Europe, Canada and the US. Both vacuum packaging (removal of air from the package) and addition of gases within the package are considered MAP.

Advances in Fresh-Cut Fruits and Vegetables Processing

Despite a worldwide increase in demand for fresh-cut fruit and vegetables, in many countries these products are prepared in uncontrolled conditions and have the potential to pose substantial risk for consumers. Correspondingly, researchers have ramped up efforts to provide adequate technologies and practices to assure product safety while keeping n

Postharvest Handling

The world population has been increasing day by day, and demand for food is rising. Despite that, the natural resources are decreasing, and production of food is getting difficult. At the same time, about one-quarter of what is produced never reaches the consumers due to the postharvest losses. Therefore, it is of utmost importance to efficiently handle, store, and utilize produce to be able to feed the world, reduce the use of natural resources, and help to ensure sustainability. At this point, postharvest handling is becoming more important, which is the main determinant of the postharvest losses. Hence, the present book is intended to provide useful and scientific information about postharvest handling of different produce.

Modified Atmosphere Packaging of Foods

A complete guide to the principles and practical application of modified atmosphere packaging Modified atmosphere packaging (MAP) is one of the most cost-effective, versatile, and commonly used methods of preserving food products available today. Employed in both ambient and chilled conditions, it can prolong shelf-life and preserve the quality of a wide array of items via careful processes of atmospheric engineering. The essential scientific principles underlying this technology can, however, be difficult to grasp and effectively apply. With *Modified Atmosphere Packaging of Foods*, esteemed food science professor Dong Sun Lee provides a thorough and practical explanation of all aspects of MAP. Chapters covering the development, impact, and day-to-day application of the technique give a well-rounded understanding of its pivotal role in the food industry, while accounts of other active packaging methods help to provide broader context. This important new book includes: Detailed guidance on all aspects

of MAP – from its scientific background to its practical application Information on how specific MAP products may be developed according to their particular engineering principles Coverage of the related active and intelligent packaging techniques Discussion of relevant food safety issues and regulations Containing vital information for industry professionals and food science researchers alike, Modified Atmosphere Packaging of Foods is an essential text for all those working to improve the quality and shelf-life of the food we eat.

Fresh-Cut Fruits and Vegetables

Fresh-cut Fruits and Vegetables: Science, Technology, and Market provides a comprehensive reference source for the emerging fresh-cut fruits and vegetables industry. It focuses on the unique biochemical, physiological, microbiological, and quality changes in fresh-cut processing and storage and on the distinct equipment design, packaging requirements, production economics, and marketing considerations for fresh-cut products. Based on the extensive research in this area during the past 10 years, this reference is the first to cover the complete spectrum of science, technology, and marketing issues related to this field, including production, processing, physiology, biochemistry, microbiology, safety, engineering, sensory, biotechnology, and economics. ABOUT THE EDITOR: Olusola Lamikanra, Ph.D., is a Research Chemist and Lead Scientist at the U.S. Department of Agriculture, Agricultural Research Service, Southern Regional Research Center, New Orleans, Louisiana. He received his B.S. degree from the University of Lagos, Nigeria, and his Ph.D. from the University of Leeds, England. He was Professor in the Division of Agricultural Sciences and Director of the Center for Viticultural Science and Small Farm Development at Florida A&M University, Tallahassee. Dr. Lamikanra is the author of more than 100 publications.

Minimally Processed Refrigerated Fruits & Vegetables

Introduction to minimally processed refrigerated fruits and vegetables; Initial preparation, handling, and distribution of minimally processed refrigerated fruits; Preservation methods for minimally processed refrigerated fruits and vegetables; Packing of minimally processed fruits and vegetables; Some biological and physical principles underlying modified atmosphere packaging; Microbiological spoilage and pathogens in minimally processed refrigerated fruits and vegetables; Nutritional quality of fruits and vegetables subject to minimally processes; Regulatory issues associated with minimally processed refrigerated foods.

The Effect of Surface Treatments and Modified Atmosphere Packaging (MAP) on the Quality of Fresh Cut Sliced Anjou Pears

Modified atmosphere packaging (MAP) has proved to be one of the most significant and innovative growth areas in retail food packaging of the past two decades. Bulk modified atmosphere packs have been an accepted form of packaging for meat and poultry in the USA since the early 1970s, but MAP is only now of being widely adopted. Today there is a substantial wholesale on the verge market for bulk packaged fresh vegetables and fruit, and the most significant retail MAP products are fresh pasta, pre-cooked poultry and sausage, and biscuits (a unique American product). The United Kingdom is the biggest single market for the modified atmosphere packaging of fresh chilled food products, accounting for about half of the total European market. A further quarter is represented by France. The success of MAP in both the British and French markets can be attributed to the large, highly sophisticated food retailing multiples and dense populations existing in both countries.

Principles and Applications of Modified Atmosphere Packaging of Foods

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.

Packaging for Nonthermal Processing of Food

This Brief critically reviews the applied techniques in all the studied vegetables and summarizes the effect of modified atmosphere packaging (MAP) in all the quality parameters. In a brief introduction chemical and microbiological parameters that affect shelf life are mentioned, followed by a definition of modified atmosphere packaging. The referred vegetables are categorized into 10 categories: roots, tubers, leafy vegetables, fruits-vegetables, bulbs, stems and shoots, flowers, seeds, fungi and other. The effect of selected MAP applications on the shelf life of the vegetables is also highlighted. Along with atmosphere modification, several storage parameters such as temperature, several pretreatments, film permeability or light and dark storage conditions are studied and their interaction on the quality of the product is also taken under consideration. The increasing demand for healthier and “safer” foods has led the food industry in pursuit of storage technologies that will serve the primary role of storage life prolongation but with no sacrifice on nutritional value and without the presence of additives. MAP is a storage technique that has already proven to be effective in extending the shelf life of the product by reducing respiration rate and preserving all its quality characteristics. Due to many physiological factors that affect the shelf life of minimally processed vegetables (respiration rate, ethylene production, maturation and ripening) the selection of the ideal storage parameters (gas mixture, storage temperature, packaging film, and treatments prior to packaging) of MAP is a challenging procedure and must be planned carefully.

Application of Modified Atmosphere Packaging on Quality of Selected Vegetables

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

Progress in Food Preservation

Modified atmospheres are used to preserve foods without the need for unwanted preservatives. This book covers the subject from an industrial perspective and explains both how the technology works, and how it can be used. The editor and authors all have extensive practical knowledge of the subject and are world recognized authorities in the field. The new edition contains four new chapters and around 50% new material overall.

Principles and Applications of Modified Atmosphere Packaging of Foods

Focusing on the great variety of research being done in the field of postharvest pathology, this volume presents a collection of topics concerning the diseases of harvested fruits and vegetables. Each chapter represents a separate unit which taken together create a better understanding of the whole subject. Topics include the causal agents of postharvest diseases of fruits and vegetables, their sources and

their ways of penetration into the host; factors that may accelerate the development of the pathogen in the host - and those that suppress them; a list of the main pathogens of fruits and vegetables, their hosts and the diseases elicited by them; and a detailed description of the major diseases of selected groups of fruits and solanaceous vegetable fruits. Attack mechanisms of pathogens and defense mechanisms of the host are examined as are treatments aimed at suppressing postharvest diseases. The search for natural and safe chemical compounds and the variety of alternative physical and biological methods for use in postharvest disease control are emphasized. Teachers and students who focus on postharvest pathology, scientists in research institutes, companies dealing with fruit and vegetable preservation technologies and for all those striving to improve the quality of harvested fruits and vegetables will find this book of great interest.

Postharvest Diseases of Fruits and Vegetables

This is the first in-depth presentation in book form of both modified atmosphere and sous vide food preservation and packaging technologies and applications. The use of these technologies with all applicable food product categories is examined. The authors are specialists in these preservation/packaging methods from North America and Europe. All significant aspects are examined including processes and materials, applications, microbiological control, and regulations and guidelines. Topics of special interest include use of hurdles, HACCP, gas absorbents and generators, and time-temperature indicators. Extensive practical reference data is economically presented in tables.

Principles of Modified-Atmosphere and Sous Vide Product Packaging

Many factors are relevant in making the proper choice of food packaging material, including those related to shelf life and biodegradability. To meet these demands, new processing and preservation techniques have arisen, most notably modified atmosphere packaging (MAP) and active packaging (AP). Modified Atmosphere and Active Packaging Technologies

Modified Atmosphere and Active Packaging Technologies

A comprehensive introduction to the physiology, biochemistry, and molecular biology of produce growth, paired with cutting-edge technological advances in produce preservation. Revised and updated, the second edition of *Postharvest Biology and Nanotechnology* explores the most recent developments in postharvest biology and nanotechnology. Since the publication of the first edition, there has been an increased understanding of the developmental physiology, biochemistry, and molecular biology during early growth, maturation, ripening, and postharvest conditions. The contributors—noted experts in the field—review the improved technologies that maintain the shelf life and quality of fruits, vegetables, and flowers. This second edition contains new strategies that can be implemented to remedy food security issues, including but not limited to phospholipase D inhibition technology and ethylene inhibition via 1-MCP technology. The text offers an introduction to technologies used in production practices and distribution of produce around the world, as well as the process of senescence on a molecular and biochemical level. The book also explores the postharvest value chain for various produce, quality evaluation techniques, and the most current nanotechnology applications. This important resource:

- Expands on the first edition to explore in-depth postharvest biology with emphasis on developments in nanotechnology
- Contains contributions from leaders in the field
- Includes the most recent advances in postharvest biology and technology, including but not limited to phospholipase D and 1-MCP technology
- Puts the focus on basic science as well as technology and practical applications
- Applies a physiology, biochemistry, and biotechnology approach to the subject

Written for crop science researchers and professionals, horticultural researchers, agricultural engineers, food scientists working with fruits and vegetables, *Postharvest Biology and Nanotechnology, Second Edition* provides a comprehensive introduction to this subject, with a grounding in the basic science with the technology and practical applications.

Postharvest Biology and Nanotechnology

This new edition of *Innovations in Food Packaging* ensures that readers have the most current information on food packaging options, including active packaging, intelligent packaging, edible/biodegradable packaging, nanocomposites and other options for package design. Today's packaging not only contains and protects food, but where possible and appropriate, it can assist in inventory control, consumer education, increased market availability and shelf life, and even in ensuring the safety of the food product. As nanotechnology and other technologies have developed, new and important options for

maximizing the role of packaging have emerged. This book specifically examines the whole range of modern packaging options. It covers edible packaging based on carbohydrates, proteins, and lipids, antioxidative and antimicrobial packaging, and chemistry issues of food and food packaging, such as plasticization and polymer morphology. Professionals involved in food safety and shelf life, as well as researchers and students of food science, will find great value in this complete and updated overview. New to this edition: Over 60% updated content — including nine completely new chapters — with the latest developments in technology, processes and materials Now includes bioplastics, biopolymers, nanoparticles, and eco-design of packaging

Innovations in Food Packaging

The benefits of food irradiation to the public health have been described extensively by organizations such as the Centers for Disease Control and Prevention in the U.S. and the World Health Organization. The American Medical Association and the American Dietetic Association have both endorsed the irradiation process. Yet the potential health benefits of irradiation are unknown to many consumers and food industry representatives who are wary of irradiated foods due to myth-information from “consumer-advocate” groups. Food Irradiation Research and Technology presents the latest scientific findings of researchers at the leading edge of food irradiation. In this book, experts from industry, government, and academia: define the basic principles of irradiation and the public health benefits of irradiation describe advances in irradiation technology, detection technology, and radiation dosimetry review the regulations pertaining to food irradiation and the toxicological safety data provide food industry representatives and public health officials with effective methodologies to educate consumers and counteract misinformation review recent advances in the irradiation of meat and poultry, fruits and vegetables, seafood, and the use of irradiation as a phytosanitary treatment Food Irradiation Research and Technology appeals to a broad readership: industry food scientists involved in the processing of meat and fish, fruits and vegetables; food microbiologists and radiation processing specialists; government and industry representatives involved in the import and export of food commodities; and industry, local, and state officials involved in educational efforts regarding food irradiation. Food scientists and technologists share a responsibility to ensure that educational materials provided to the public regarding food safety and processing technologies are based on sound science and fact, not on misconceptions. Food Irradiation Research and Technology meets that goal.

Food Irradiation Research and Technology

The preservation of freshness of fruits and vegetables until their consumption is the aim of many research activities. The quality losses of fresh fruit and vegetables during cold chain are frequently attributable to an inappropriate use of postharvest technologies. Moreover, especially when fresh produce is transported to distant markets, it is necessary to adopt proper storage solutions in order to preserve the initial quality. Nowadays, for each step of the supply chain (packing house, cold storage rooms, precooling center, refrigerate transport, and distribution), innovative preservation technologies are available that, alone or in combination, could preserve the fresh products in order to maintain the principal quality and nutritional characteristics. In this Special Issue, these preservation technologies will be described, highlighting their effect on quality maintenance.

Innovative Preservation Technology for the Fresh Fruit and Vegetables

At the 50th Anniversary Meeting of the Institute of Food Technologists the ten most significant innovations in food science developed during the past 50 years were named (Food Technology, September 1989). Among the “Top 10” innovations, controlled atmosphere packaging (CAP) for fruits and vegetables was listed 5th in order of importance. Of course, CAP is a forerunner of MAP (modified atmosphere packaging) in which a variety of food products are packaged under selective mixtures of atmospheric gases, but without the on-going maintenance (control) of the gas mixture. Development of packaging systems and films that are selectively permeable to specific gases has been the key element in the commercialization of controlled and modified atmosphere packaging of foods. It may not be far from the truth to say that since then there has been an explosion of activities around MAP/CAP, especially in research and development into various aspects of this technology. The application of MAP to some bakery products, fresh fruits and salads and fresh meats and meat products has reached a significant level both in Europe and North America. The increasing consumer demand for fresh or near-fresh products and convenient, microwavable foods has added impetus to the growth of MAP/CAP

technology. It is, therefore, timely that a comprehensive book that provides scientific background and practical applications of the technology should be written.

Modified Atmosphere Packaging of Food

This book provides valuable information on a range of food packaging topics. It serves as a source for students, professionals and packaging engineers who need to know more about the characteristics, applications and consequences of different packaging materials in food-packaging interactions. This book is divided into 13 chapters and focuses on the agro-food, cosmetics and pharmaceutical sectors. The first four chapters cover traditional packaging materials: wood, paper and cardboard, glass and metal. The next two deal, respectively, with plastics and laminates. Biobased materials are then covered, followed by a presentation of active and smart packaging. Some chapters are also dedicated to providing information on caps and closures as well as auxiliary materials. Different food packaging methods are presented, followed by an investigation into the design and labelling of packaging. The book ends with a chapter presenting information on how the choice of packaging material is dependent on the characteristics of the food products to be packaged.

Packaging Materials and Processing for Food, Pharmaceuticals and Cosmetics

Modified atmosphere (MA) and controlled atmosphere (CA) technologies have great potential in a wide range of applications. The increasingly global nature of food production and the increased emphasis on reducing chemical preservatives and pesticides have put the spotlight on these centuries-old technologies. Yet until now, there have been very few current resources available, and none have covered all aspects. Provides extensive background on the theory and application of modified and controlled atmospheres Written by top international experts in research and industry, *Modified and Controlled Atmospheres for the Storage, Transportation, and Packaging of Horticultural Commodities* explores the science and application of the modified atmosphere (MA) and the controlled atmosphere (CA). It covers all technological applications, including storage, transport, and packaging for all fruits, vegetables, and ornamentals of temperate, subtropical, and tropical origin. Tracing the historical developments of these technologies, it provides information on the ideal conditions to be used for many horticultural commodities. It also outlines the effects of MA and CA on the physiology and biochemistry of these commodities as well as on their flavor and quality. Providing the most comprehensive resource on all basic and applied aspects of these technologies, the text also reviews the vast amount of literature already written on this topic. This extensive work captures, for the first time, the entire subject of MA and CA, presenting a complete review of the technological aspects of this important development in food safety and preservation.

Modified and Controlled Atmospheres for the Storage, Transportation, and Packaging of Horticultural Commodities

Note for the electronic edition: This draft has been assembled from information prepared by authors from around the world. It has been submitted for editing and production by the USDA Agricultural Research Service Information Staff and should be cited as an electronic draft of a forthcoming publication. Because the 1986 edition is out of print, because we have added much new and updated information, and because the time to publication for so massive a project is still many months away, we are making this draft widely available for comment from industry stakeholders, as well as university research, teaching and extension staff.

The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks

This volume addresses the challenges of the short shelf life of fruits and vegetables. Innovative packaging technologies are the most promising strategies for overcoming these limitations. This book provides a host of sustainable packaging solutions that deliver protection, branding, consumer attractiveness, and speed to market in a competitive retail environment. Key features of the book: • Provides an informative overview of fruit and vegetable requirements and available packaging materials and systems • Provides an understanding of the fundamentals of the impact of packaging on the quality and safety of fruits and vegetables • Covers the fundamental aspects of packaging requirements, including mathematical modeling and mechanical and engineering properties of packaging materials • Presents an in-depth discussion of innovative packaging technologies, such as MA/CA packaging, active packaging, intelligent packaging, and eco-friendly materials applied to fruit and vegetables • Looks at packaging design for better environmental and economic performance

Innovative Packaging of Fruits and Vegetables: Strategies for Safety and Quality Maintenance

This book presents a significant and up-to-date review of various integrated approaches to food engineering. Distinguished food engineers and food scientists from key institutions worldwide have contributed chapters that provide a deep analysis of their particular subjects. Emerging technologies and biotechnology are introduced, and the book discusses predictive microbiology, packing materials for foods, and biodegradable films. This book is mainly directed to academics, and to undergraduate and postgraduate students in food engineering and food science and technology, who will find a selection of topics.

Food Engineering: Integrated Approaches

Brings together articles from many of the world's leading experts in modified atmosphere, controlled atmosphere, and vacuum packaging technologies for the packaging of fresh and minimally processed foods. These articles offer a brief overview of the scientific principles of CA, MA, and VP; examine various commercial applications of CA, MA and VP in the United States and throughout Europe; present summaries of ongoing research on MA and CA packaging; and provide a broad perspective on issues related to health and safety.

Modified Atmosphere Food Packaging

Packaging continues to be one of the most important and innovative areas in food processing. Edited by a leading expert in the field, and with its distinguished international team of contributors, Novel food packaging techniques provides an authoritative and comprehensive review of the key trends. Part one discusses the range of active packaging techniques such as the use of oxygen and other scavengers, moisture regulation and antimicrobial packaging in food preservation. It also covers the use of intelligent systems such as time-temperature and freshness indicators to assess food quality. Part two reviews developments in modified atmosphere packaging (MAP) and its role in enhancing product safety and quality. Part three describes packaging applied in practice to particular products such as meat and fish. Part four covers other key issues such as packaging optimisation, the legislative context, sustainable packaging and consumer attitudes. Novel food packaging techniques is a standard reference for the food industry in optimising the use of packaging to improve product safety and quality. Provides an authoritative and comprehensive review of the key trends of food packaging Discusses the range of active packaging techniques such as the use of oxygen and other scavengers, moisture regulation and antimicrobial packaging in food preservation Covers packaging optimisation, the legislative context, sustainable packaging and consumer attitudes

Novel Food Packaging Techniques

The use of controlled atmosphere storage has great potential to reduce the postharvest use of chemicals, maintain the nutritional quality of fruits and vegetables and reduce physical losses. This revised edition incorporates the latest research to provide a comprehensive and up-to-date overview of the range of conditions currently in use, their effect on flavour, quality and physiology, the influence of pests and diseases, environmental factors and packaging as well as a synthesis of recommendations for each fruit and vegetable.

Controlled Atmosphere Storage of Fruits and Vegetables

The protection and preservation of a product, the launch of new products or re-launch of existing products, perception of added-value to products or services, and cost reduction in the supply chain are all objectives of food packaging. Taking into consideration the requirements specific to different products, how can one package successfully meet all of these goals? Food Packaging Technology provides a contemporary overview of food processing and packaging technologies. Covering the wide range of issues you face when developing innovative food packaging, the book includes: Food packaging strategy, design, and development Food biodeterioration and methods of preservation Packaged product quality and shelf life Logistical packaging for food marketing systems Packaging materials and processes The battle rages over which type of container should be used for which application. It is therefore necessary to consider which materials, or combination of materials and processes will best serve the market and enhance brand value. Food Packaging Technology gives you the tools to determine which form of packaging will meet your business goals without compromising the safety of your product.

Food Packaging Technology

Pineapple is the third most important tropical fruit in the world, with production occurring throughout the tropics. The demand for low acid fresh pineapples and its processed products is one of the fastest growing markets, especially in Europe and North America. This book provides an in depth and contemporary coverage of knowledge and practices in the value chain of this popular fruit, from production through to consumption. The chapters explore all the most recent developments in areas such as breeding, novel processing technologies, postharvest physiology and storage, packaging, nutritional quality and safety aspects. An outstanding team of authors from across the globe have contributed to make this the definitive pineapple handbook. Handbook of Pineapple Technology: Production, Postharvest Science, Processing and Nutrition is the ultimate guide for scientists in the food industries specializing in fruit processing, packaging and manufacturing. It is also a useful resource for educators and students of food technology and food sciences as well as research centers and regulatory agencies around the world.

Handbook of Pineapple Technology

This book provides technical explanations of the materials, structure and design of containers, packages and coatings used to protect, ship and sell fruits and vegetables throughout the entire supply chain. Based on extensive research, as well as input from growers, graders, packers, shippers and retailers, the book offers detailed information about applying and designing packaging for post-harvest treatment, cold chain storage, shipping containment and merchandising. These include methods for calculating materials and costs, as well as discussions of modified atmosphere packaging, edible coatings and other advanced approaches. Packaging & Distribution of Fresh Fruits & Vegetables clarifies how fruits and vegetables must be packaged at each stage of post-harvest processing to ensure an appealing product with requisite shelf-life. The authors demonstrate the critical relation between fruit and vegetable quality control and packaging. More importantly, they explain the chemistry and materials technology needed to create packaging that can offset microbial contamination and reduce bruising, spoilage and waste in a wide range of produce. The book includes dozens of case studies and addresses international variations in packaging strategies and regulations.

Packaging & Distribution of Fresh Fruits & Vegetables

Handbook of Vegetables and Vegetable Processing, Second Edition is the most comprehensive guide on vegetable technology for processors, producers, and users of vegetables in food manufacturing. This complete handbook contains 42 chapters across two volumes, contributed by field experts from across the world. It provides contemporary information that brings together current knowledge and practices in the value-chain of vegetables from production through consumption. The book is unique in the sense that it includes coverage of production and postharvest technologies, innovative processing technologies, packaging, and quality management. Handbook of Vegetables and Vegetable Processing, Second Edition covers recent developments in the areas of vegetable breeding and production, postharvest physiology and storage, packaging and shelf life extension, and traditional and novel processing technologies (high-pressure processing, pulse-electric field, membrane separation, and ohmic heating). It also offers in-depth coverage of processing, packaging, and the nutritional quality of vegetables as well as information on a broader spectrum of vegetable production and processing science and technology. Coverage includes biology and classification, physiology, biochemistry, flavor

and sensory properties, microbial safety and HACCP principles, nutrient and bioactive properties In-depth descriptions of key processes including, minimal processing, freezing, pasteurization and aseptic processing, fermentation, drying, packaging, and application of new technologies Entire chapters devoted to important aspects of over 20 major commercial vegetables including avocado, table olives, and textured vegetable proteins This important book will appeal to anyone studying or involved in food technology, food science, food packaging, applied nutrition, biosystems and agricultural engineering, biotechnology, horticulture, food biochemistry, plant biology, and postharvest physiology.

Handbook of Vegetables and Vegetable Processing

Food process modelling provides an authoritative review of one of the most exciting and influential developments in the food industry. The modelling of food processes allows analysts not only to understand such processes more clearly but also to control them more closely and make predictions about them. Modelling thus aids the search for greater and more consistent food quality. Written by a distinguished international team of experts, Food process modelling covers both the range of modelling techniques and their practical applications across the food chain.

Food Process Modelling

Food Quality and Shelf Life covers all aspects and challenges of food preservation, packaging and shelf-life. It provides information on the most important pillars in the field, starting with active and smart packaging materials, novel technologies, and control tools in all stages between production and consumer. The book gives emphasis to methodological approaches for sensory shelf-life estimation and the impact of packaging on sensorial properties. Researchers and professionals alike will find this reference useful, especially those who are interested in the performance evaluation of future packaging for fresh produce in the cold chain and temperature management in the supply chain. Presents insights regarding new trends in emerging technologies in the field Includes hot topics, such as modified atmosphere packaging and active materials to improve shelf-life Provides shelf-life assessment and modeling methodologies and accelerated shelf-life testing

Food Quality and Shelf Life

This Brief reviews the effects of increasing and reducing atmospheric pressure on the postharvest life of fruit and vegetables. The text covers the common methods and technologies used and evaluates the history and benefits of hypobaric and hyperbaric storage. Both of these techniques have the potential to address quantitative and qualitative challenges in the postharvest sector of the fresh fruit and vegetables industry. Hypobaric and Hyperbaric Storage of Fruit and Vegetables reports on the effects of storage on over 45 types of fruit and vegetables, as well as on whole plants and cut flowers. As consumer demand for high quality product increases, proper postharvest storage will continue to gain in importance. The environmental conditions used in storage have a vital influence on the quality, safety and health benefits of fruit and vegetables.

Fruit and Vegetable Storage

Because they meet the needs of today's consumers, fresh-cut plant products are currently one of the hottest commodities in the food market of industrialized countries. However, fresh-cut produce deteriorates faster than the correspondent intact produce. The main purpose of Fresh-Cut Fruits and Vegetables: Technology, Physiology, and Safety is to provide helpful guidelines to the industry for minimizing deterioration, keeping the overall quality, and lengthening the shelf life. It provides an integrated and interdisciplinary approach for accomplishing the challenges, where raw materials, handling, minimal processing, packaging, commercial distribution, and retail sale must be well managed. It covers technology, physiology, quality, and safety of fresh-cut fruits and vegetables. In this book, the chapters follow a logical sequence analyzing most of the important factors affecting the main characteristics of fresh-cut horticultural products. The most relevant technologies to prevent deterioration and improve final overall quality of fresh-cut commodities are described in detail. This book covers the basics of the subject from quality preservation, nutritional losses, physiology, and safety to industry-oriented advancements in sanitization, coatings, and packaging. It examines such novel preservation technologies as edible coatings, antimicrobial coatings, natural antimicrobials, gum arabic coatings, and pulsed light treatments. Minimal processing design and industrial equipment are also reviewed. With its international team of contributors, this book will be an essential reference work

both for professionals involved in the postharvest handling of fresh-cut and minimally processed fruits and vegetables and for academic and researchers working in the area.

Fresh-Cut Fruits and Vegetables

Since the publication of the first edition of this text, ever-increasing coatings research has led to many developments in the field. Updated and completely revised with the latest discoveries, *Edible Coatings and Films to Improve Food Quality, Second Edition* is a critical resource for all those involved in buying, selling, regulating, developing, or using coatings to improve the quality and safety of foods. Topics discussed in this volume include: The materials used in edible coatings and films The chemical and physical properties of coatings and how the coating or film ingredients affect these properties How coatings and films present barriers to gases and water vapors How coatings and films can improve appearance, or conversely, result in discoloration and cause other visual defects, as well as how to avoid these problems The use of coatings and films on fresh fruit and vegetables, fresh-cut produce, and processed foods How to apply coatings to various commodities How coatings can function as carriers of useful additives, including color, antioxidants, and flavorings Regulation of coatings and coating ingredients by various governing bodies The information contained in this volume is destined to encourage further advances in this field for food and pharmaceutical products. Aggressive research into these products can help to reduce plastic waste, improve applications, lead to greater efficacy, and make regulatory decisions easier in a global climate—ultimately resulting in economical, heightened quality of food and pharmaceutical products.

Edible Coatings and Films to Improve Food Quality, Second Edition