The Microbiological Safety of Low Water Activity Foods and Spices

Joshua B. Gurtler

2014-12-08

Low water activity (aw) and dried foods such as dried dairy and meat products, grain-based and dried ready-to-eat cereal products, powdered infant formula, peanut and nut pastes, as well as flours and meals have increasingly been associated with product recalls and foodborne outbreaks due to contamination by pathogens such as Salmonella spp. and enterohemorrhagic E. coli. In particular, recent foodborne outbreaks and product recalls related to Salmonella-contaminated spices have raised the level of public health concern for spices as agents of foodborne illnesses. Presently, most spices are grown outside the U.S., mainly in 8 countries: India, Indonesia, China, Brazil, Peru, Madagascar, Mexico and Vietnam. Many of these countries are under-developed and spices are harvested and stored with little heed to sanitation. The FDA has regulatory oversight of spices in the United States; however, the agency’s control is largely limited to enforcing regulatory compliance through sampling and testing only after imported foodstuffs have crossed the U.S. border. Unfortunately, statistical sampling plans are inefficient tools for ensuring total food safety. As a result, the development and use of decontamination treatments is key. This book provides an understanding of the microbial challenges to the safety of low aw foods, and a historic backdrop to the paradigm shift now highlighting low aw foods as vehicles for foodborne pathogens. Up-to-date facts and figures of foodborne illness outbreaks and product recalls are included. Special attention is given to the uncanny ability of Salmonella to persist under dry conditions in food processing plants and foods. A section is dedicated specifically to processing plant investigations, providing practical approaches to determining sources of persistent bacterial strains in the industrial food processing environment. Readers are guided through dry cleaning, wet cleaning and alternatives to processing plant hygiene and sanitation. Separate chapters are devoted to low aw food commodities of interest including spices, dried dairy-based products, low aw meat products, dried ready-to-eat cereal products, powdered infant formula, nuts and nut pastes, flours and meals, chocolate and confectionary, dried teas and herbs, and pet foods. The book provides regulatory testing guidelines and recommendations as well as guidance through methodological and sampling challenges to testing spices and low aw foods for the presence of foodborne pathogens. Chapters also address decontamination processes for low aw foods, including heat, steam, irradiation, microwave, and alternative energy-based treatments.
Microbial safety of lipid-based ready-to-use foods for management of moderate acute malnutrition and severe acute malnutrition - Second report - World Health Organization 2021-02-15 Lipid-based ready-to-use foods (RUFs) for the nutritional management of moderate acute malnutrition (MAM) and severe acute malnutrition (SAM) are provided to children from 6 months to 59 months of age within the context of emergency feeding programmes supervised by governments. Based on the review, the expert committee considered that children with SAM have an increase in susceptibility to bacteraemia and sepsis that is probably between twofold and fivefold compared with children who are not malnourished and are of the same age and live in the same communities. On the basis of its common occurrence as a cause of infections and serious illnesses in children with SAM, and its documented ability to contaminate, survive in, and cause outbreaks of illness associated with low-moisture foods similar to RUFs, the expert committee concluded that Salmonella is the pathogen of most concern in lipid-based RUFs. Many outbreaks of foodborne salmonellosis have been determined to be associated with low-moisture foods that were contaminated at low levels. Therefore, the expert committee carefully considered the qualitative microbiological analyses of RUFs and the contamination levels that could be inferred, and entered into an extended deliberation of dose-response modelling to find a path toward a reasonable approximation of the likely morbidity and mortality in SAM children that could be anticipated from consumption of RUFs contaminated at the estimated levels and observed frequency. The expert committee described three approaches that purchasers of RUFs might use to establish microbiological criteria to assure the safety of RUFs and to communicate to manufacturers their safety expectations. These approaches are: (i) reference to existing standards established for similar low-moisture foods; (ii) determining an acceptable increase in risk over the pre-existing baseline of illness from other sources of exposure; and (iii) process verification sampling using the moving window technique. The microbiological criteria derived by each of these approaches accomplish different purposes, and which is most appropriate is determined by the conditions of manufacture and use.

Radiofrequency-assisted Thermal Processing for Improving Microbiological Safety of Low-moisture Food Powders - Sreenivasula Reddy Boreddy 2015 The continuous RF-assisted thermal processing of EWP and SWF in packaging conditions was demonstrated experimentally. The package processed EWP at 80°C for 16 h exhibited excellent foaming and gelling properties as compared to that of the traditional and batch mode processed EWP. The important quality and functionality of the packaged SWF at 80°C for 7 h was not significantly different from that of the unpasteurized SWF. Thus, the RF-assisted thermal processing has shown great potential for thermal processing of low-moisture food powders by reducing the come-up time without compromising their quality and functionality. This study demonstrated a novel method to pasteurize low-moisture food powders. This study also determined the physical, thermal, and dielectric properties of EWP, which are important inputs for modeling RF heating. This helps further optimization of the electrode and food packaging configurations, which would further reduce the come-up time.

Microbiology of Fresh Produce - Karl R. Matthews 2006 Presents the latest research and industry practices promoting microbiological safety of fruits and vegetables. - Examines key issues of microbiological safety of fresh produce, from production to consumption, and focuses on the unique challenges the specialists encounter in controlling microorganisms found on produce. - Highlights microorganisms associated with human illness and linked to consumption of contaminated produce. - Discusses industry trends and topical issues, including the microbiology of imported and domestic produce, good agricultural practices, irradiation, edible films, and diagnostic techniques used in the field. - Features a chapter devoted to the practices related to the safety of seed sprouts, covering valuable information relevant to the producer, researcher, and extension specialist.

Assessing Microbial Safety of Drinking
Water Improving Approaches and Methods
OECD 2003-03-20 This book provides a state-of-the-art review on approaches and methods used in assessing the microbial safety of drinking-water.

Biosafety in the Laboratory
Division on Engineering and Physical Sciences 1989-01-01
Biosafety in the Laboratory is a concise set of practical guidelines for handling and disposing of biohazardous material. The consensus of top experts in laboratory safety, this volume provides the information needed for immediate improvement of safety practices. It discusses high- and low-risk biological agents (including the highest-risk materials handled in labs today), presents the "seven basic rules of biosafety," addresses special issues such as the shipping of dangerous materials, covers waste disposal in detail, offers a checklist for administering laboratory safety—and more.

Control of Salmonella and Other Bacterial Pathogens in Low-Moisture Foods
Richard Podolak 2017-09-05

Sanitation Practice Effectiveness -- 3.3 Pest Control -- 3.3.1 Integrated Pest Management -- 3.3.2 Web Resources for More Information -- 3.3.3 Choosing a Pest Control Partner -- 3.4 Salmonella Harborage in the Facility -- 3.4.1 Sanitation Practices that may Lead to the Spread of Pathogens -- 3.4.2 Equipment Sources -- 3.4.3 Hygienic Sources -- 3.4.4 Management Practices for Cleaning Equipment -- 3.4.5 Rolling Stock -- 3.4.6 Raw Materials -- 3.5 Conclusions -- References

Foodborne Pathogens
Joshua B. Gurtler 2017-06-14
Foodborne illnesses continue to be a major public health concern. All members of a particular bacterial genera (e.g., Salmonella, Campylobacter) or species (e.g., Listeria monocytogenes, Cronobacter sakazakii) are often treated by public health and regulatory agencies as being equally pathogenic; however, this is not necessarily true and is an overly conservative approach to ensuring the safety of foods. Even within species, virulence factors vary to the point that some isolates may be highly virulent, whereas others may rarely, if ever, cause disease in humans. Hence, many food safety scientists have concluded that a more appropriate characterization of bacterial isolates for public health purposes could be by virotyping, i.e., typing food-associated bacteria on the basis of their virulence factors. The book is divided into two sections. Section I, “Foodborne Pathogens and Virulence Factors,” hones in on specific virulence factors of foodborne pathogens and the role they play in regulatory requirements, recalls, and foodborne illness. The oft-held paradigm that all pathogenic strains are equally virulent is untrue. Thus, we will examine variability in virulence between strains such as Listeria, Salmonella, Campylobacter, Cronobacter, etc. This section also examines known factors capable of inducing greater virulence in foodborne pathogens. Section II, “Foodborne Pathogens, Host Susceptibility, and Infectious Dose”, covers the ability of a pathogen to invade a human host based on numerous extraneous factors relative to the host and the environment. Some of these factors include host age, immune status, genetic makeup, infectious dose, food composition and probiotics. Readers of this book will come away with a better understanding of foodborne bacterial pathogen virulence factors and pathogenicity, and host factors that predict the severity of disease in humans.
Microbiological Safety of Low Salt and Low Fat Cheddar Cheese - Anuj Mehta 1994

An Evaluation of the Role of Microbiological Criteria for Foods and Food Ingredients - National Research Council 2018-11-10

Microbiological Safety of Retail Foods Available in Low and High Socioeconomic Neighborhoods in Memphis Metropolitan Area - Daleniece Higgins 2016 Retail foods available in areas with higher food insecurity and Low Socioeconomic Status (SES) are known to be of inferior quality than High SES areas. The purpose of this research was to assess the availability of different food choices and evaluate the microbiological quality of foods available at retail outlets in Low SES and High SES areas in Memphis metropolitan. Survey of Low and High SES stores, aerobic plate count, selective plating, and multiplex polymerase chain reactions were conducted to determine the differences in food availability, microbial load, and the microbial composition of selected retail foods procured from Low and High SES areas. Foods from Low SES areas were found to have higher bacterial loads and a differential microbial composition (with an abundance of generic E. coli) as compared to food items obtained from High SES areas. The results indicate the disparity in microbiological quality of foods available to populations.

Microbial Safety of Minimally Processed Foods - Vijay K. Juneja 2002-12-03 While minimally processed foods satisfy the increasing market demands for foods with fewer preservatives, higher nutritive value, and fresh sensory attributes, there is a greater risk of diseases if they are improperly handled. Microbial Safety of Minimally Processed Foods explores innovative preventative solutions to food-borne diseases from the perspectives of the producer, the handler, the consumer, the food preparer, as well as the food inspector, and researcher. This book provides you with the latest research and insight into assuring the microbial safety of red meats, poultry, fish, vegetables, fruits, and bakery products that receive less than stringent sterilizing preparation. It explores and describes the methods used for pathogen detection along with strategies for preventing future pathogen occurrences in the minimally processed foods. The book also provides in-depth evaluations of HACCP regulations and risk assessments of those minimally processed foods. Designed to stimulate the development of increasingly safer foods, Microbial Safety of Minimally Processed Foods details state-of-the-art technologies that have the potential to enhance microbiological safety of minimally processed foods without sacrificing their natural, untreated visual appearance and sensory properties.

Microbiological Safety and Quality of Food - Barbara Lund 2000 This authoritative two-volume reference provides valuable, necessary information on the principles underlying the production of microbiologically safe and stable foods. The work begins with an overview and then addresses four major areas: 'Principles and application of food preservation techniques' covers the specific techniques that defeat growth of harmful microorganisms, how those techniques work, how they are used, and how their effectiveness is measured. 'Microbial ecology of different types of food' provides a food-by-food accounting of food composition, naturally occurring microflora, effects of processing, how spoiling can occur, and preservation. 'Foodborne pathogens' profiles the most important and the most dangerous microorganisms that can be found in foods, including bacteria, viruses, parasites, mycotoxins, and 'mad cow disease.' The section also looks at the economic aspects and long-term consequences of foodborne disease. 'Assurance of the microbiological safety and quality of foods' scrutinizes all aspects of quality assurance, including HACCP, hygienic factory design, methods of detecting organisms, risk assessment, legislation, and the design and accreditation of food microbiology laboratories. Tables, photographs, illustrations, chapter-by-chapter references, and a thorough index complete each volume. This reference is of value to all academic, research, industrial and laboratory libraries supporting food programs; and all institutions involved in food safety, microbiology and food microbiology, quality assurance and assessment, food legislation, and generally food science and technology.

Quantitative Microbial Risk Assessment -
Microbiological Hazards in Fresh Leafy Vegetables and Herbs—World Health Organization 2008 Problems linked with pathogens in fresh produce, including the associated public health and trade implications, have been reported in a number of countries worldwide. Furthermore, from 1980 to 2004, the global production per annum of fruit and vegetables grew by 94% and they are a critical component of a healthy diet. Reported outbreaks associated with leafy vegetables and herbs have been notable for the wide geographical distribution of the contaminated products, the high numbers of consumers exposed and thus the large number of cases. This meeting addressed the pathways for contamination, survival and persistence of microbiological hazards associated with leafy vegetables and herbs, and the potential management options from primary production through to the consumer. --Publisher’s description.

Heterotrophic Plate Counts and Drinking-water Safety—Jamie Bartram 2003-08
Heterotrophic Plate Counts and Drinking-water Safety provides a critical assessment of the role of the Heterotrophic Plate Count (HPC) measurement in drinking water quality management. It was developed from an Expert workshop of 32 scientists convened by the World Health Organization and the WHO/NSF International Collaborating Centre for Drinking Water Safety and Treatment in Geneva, Switzerland. The workshop sponsors were the U.S. Environmental Protection Agency, Health Canada, U.S. Centers for Disease Control and Prevention, and the American Waterworks Association Research Foundation. Heterotrophs are organisms, including bacteria, yeasts and moulds, that require an external source of organic carbon for growth. The HPC test (or Standard Plate Count), applied in many variants, is the internationally accepted test for measuring the heterotrophic microorganism population in drinking water, and also other media. It measures only a fraction of the microorganisms actually present and does not distinguish between pathogens and non-pathogens. Although most, if not all, bacterial pathogens are heterotrophs, most of the microorganisms detected by the HPC test conditions are not human pathogens, thus the colony counts obtained do not alone normally correlate with the presence of pathogens, in the absence of other indicators of faecal contamination. High levels of microbial growth can affect the taste and odor of drinking water and may indicate the presence of nutrients and biofilms which could harbor pathogens, as well as the possibility that some event has interfered with the normal production of the drinking water. HPC counts also routinely increase in water that has been treated by an inline device such as a carbon filter or softener, in water-dispensing devices and in bottled waters and indeed in all water that has suitable nutrients, does not have a residual disinfectant, and is kept under sufficient conditions. However, there is no firm evidence that non-pathogenic bacterial growth as measured by HPC is accompanied by increased risk of illness among consumers. On the other hand there is some evidence that the presence of the indigenous non-harmful bacteria may challenge the survival of pathogens that may be present in biofilms and on surfaces. There is concern that some immuno-compromised persons may be at risk from exposure to otherwise harmless bacteria if exposure is excessive. There is debate among health professionals as to the need, utility or quantitative basis for health-based standards or guidelines relating to HPC-measured regrowth in drinking water. The issues that were addressed in this work include: the relationship between HPC in drinking water (including that derived from in-line treatment systems, dispensers and bottled water) and health risks for the general public; the role of HPC as an indirect indicator or index for pathogens of concern in drinking water; the role of HPC in assessing the efficacy and...
proper functioning of water treatment and supply processes; the relationship between HPC and the aesthetic acceptability of drinking water. Heterotrophic Plate Counts and Drinking-water Safety provides valuable information on the utility and the limitations of HPC data in the management and operation of piped water systems as well as other means of providing drinking water to the public. It is of particular value to piped public water suppliers and bottled water suppliers, manufacturers and users of water treatment and transmission equipment and inline treatment devices, water engineers, sanitary and clinical microbiologists, and national and local public health officials and regulators of drinking water quality.

The Microbiological Safety of Food in Healthcare Settings-Barbara Lund 2008-04-30
Drawing together the work of a wide range of experts, this extremely important book provides a clear, practical account of the salient features of foodborne pathogenic microorganisms and of the particular risks that they pose to vulnerable groups of the population in hospitals, nursing and residential homes, nurseries, and in the community at large. Chapters cover the following topics: • Properties and importance of microorganisms that cause foodborne disease • Surveillance of foodborne disease • Occurrence of foodborne disease in healthcare settings • Vulnerable groups of the population • Provisions for food and water • Implementation of safety systems Presenting a wealth of information of great importance, this comprehensive and well-edited book is a vital resource for physicians, doctors and nurses responsible for the control of infection, clinicians, physicians, public health doctors and specialists, those responsible for catering management, microbiologists, environmental health officers, food scientists and food technologists. It is also designed to be accessible to policy makers and administrators who may not have specialist training. Libraries in all universities, research establishments and medical schools where these subjects are studied and taught should have copies of this essential work on their shelves.

Microbiology-Holly Ahern 2018-05-22 As a group of organisms that are too small to see and best known for being agents of disease and death, microbes are not always appreciated for the numerous supportive and positive contributions they make to the living world. Designed to support a course in microbiology, Microbiology: A Laboratory Experience permits a glimpse into both the good and the bad in the microscopic world. The laboratory experiences are designed to engage and support student interest in microbiology as a topic, field of study, and career. This text provides a series of laboratory exercises compatible with a one-semester undergraduate microbiology or bacteriology course with a three- or four-hour lab period that meets once or twice a week. The design of the lab manual conforms to the American Society for Microbiology curriculum guidelines and takes a ground-up approach -- beginning with an introduction to biosafety and containment practices and how to work with biological hazards. From there the course moves to basic but essential microscopy skills, aseptic technique and culture methods, and builds to include more advanced lab techniques. The exercises incorporate a semester-long investigative laboratory project designed to promote the sense of discovery and encourage student engagement. The curriculum is rigorous but manageable for a single semester and incorporates best practices in biology education.

Seafood Safety-Institute of Medicine 1991-02-01
Can Americans continue to add more seafood to their diets without fear of illness or even death? Seafood-caused health problems are not widespread, but consumers are at risk from seafood-borne microbes and toxins—with consequences that can range from mild enteritis to fatal illness. At a time when legislators and consumer groups are seeking a sound regulatory approach, Seafood Safety presents a comprehensive set of practical recommendations for ensuring the safety of the seafood supply. This volume presents the first-ever overview of the field, covering seafood consumption patterns, where and how seafood contamination occurs, and the effectiveness of regulation. A wealth of technical information is presented on the sources of contamination—microbes, natural toxins, and chemical pollutants—and their effects on human health. The volume evaluates methods used for risk assessment and inspection sampling.

Microbial Safety of Fresh Produce-Xuetong Fan 2009-10-05 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.

Microbiological Risk Assessment in Food Processing - M. Brown 2002-09-26
Microbiological risk assessment (MRA) is one of the most important recent developments in food safety management. Adopted by Codex Alimentarius and many other international bodies, it provides a structured way of identifying and assessing microbiological risks in food. Edited by two leading authorities, and with contributions by international experts in the field, Microbiological risk assessment provides a detailed coverage of the key steps in MRA and how it can be used to improve food safety. The book begins by placing MRA within the broader context of the evolution of international food safety standards. Part one introduces the key steps in MRA methodology. A series of chapters discusses each step, starting with hazard identification and characterisation before going on to consider exposure assessment and risk characterisation. Given its importance, risk communication is also covered. Part two then considers how MRA can be implemented in practice. There are chapters on implementing the results of a microbiological risk assessment and on the qualitative and quantitative tools available in carrying out a MRA. It also discusses the relationship of MRA to the use of microbiological criteria and another key tool in food safety management, Hazard Analysis and Critical Control Point (HACCP) systems. With its authoritative coverage of both principles and key issues in implementation, Microbiological risk assessment in food processing is a standard work on one of the most important aspects of food safety management. Provides a detailed coverage of the key steps in microbiological risk assessment (MRA) and how it can be used to improve food safety.

Significance, Prevention and Control of Food Related Diseases - Hussaini Makun 2016-04-13
Food-borne diseases are major causes of morbidity and mortality in the world. It is estimated that about 2.2 million people die yearly due to food and water contamination. Food safety and consequently food security are therefore of immense importance to public health, international trade and world economy. This book, which has 10 chapters, provides information on the incidence, health implications and effective prevention and control strategies of food-related diseases. The book will be useful to undergraduate and postgraduate students, educators and researchers in the fields of life sciences, medicine, agriculture, food science and technology, trade and economics. Policy makers and food regulatory officers will also find it useful in the course of their duties.

Microbiological safety of lipid-based ready-to-use foods for management of moderate acute malnutrition and severe acute malnutrition - Food and Agriculture Organization of the United Nations 2016-01-01
Consistent with the need to provide safe food for young children, particularly during the complementary feeding period between 6 and 24 months and the period of rapid development to age 59 months, FAO and WHO convened a technical meeting in FAO headquarters, Rome, Italy, from 11 to 14 December 2012 that addressed the microbial safety of ready-to-use foods (RUF) for the management of acute malnutrition. The meeting was held at the request of the WFP and UNICEF to help them formulate a science-based response to the finding of Cronobacter spp. in lipid-based RUF and to provide guidance on appropriate microbiological specifications to include among other purchase requirements to enhance the safety of lipid-based RUF. This report provides an overview of the assessment of the risk posed by Cronobacter spp in this product and provides guidance to agencies distributing the product as well as the producers on how to manage this problem and minimise the risk to the vulnerable consuming population.
Microbiology Laboratory Guidebook-United States. Food Safety and Inspection Service. Microbiology Division 1998

Applications of Cold Plasma in Food Safety-Tian Ding

Guidelines for Drinking-water Quality-World Health Organization 1993

The Bad Bug Book-FDA 2004 This handbook provides basic facts regarding foodborne pathogenic microorganisms and natural toxins.

Foodborne Pathogens: Hygiene and Safety-Maria Schirone 2019-11-26

Strategies to Reduce Sodium Intake in the United States-Institute of Medicine 2010-11-14 Reducing the intake of sodium is an important public health goal for Americans. Since the 1970s, an array of public health interventions and national dietary guidelines has sought to reduce sodium intake. However, the U.S. population still consumes more sodium than is recommended, placing individuals at risk for diseases related to elevated blood pressure. Strategies to Reduce Sodium Intake in the United States evaluates and makes recommendations about strategies that could be implemented to reduce dietary sodium intake to levels recommended by the Dietary Guidelines for Americans. The book reviews past and ongoing efforts to reduce the sodium content of the food supply and to motivate consumers to change behavior. Based on past lessons learned, the book makes recommendations for future initiatives. It is an excellent resource for federal and state public health officials, the processed food and food service industries, health care professionals, consumer advocacy groups, and academic researchers.

Food Microbiology-Martin R Adams 2007-10-31 This widely acclaimed text covers the whole field of modern food microbiology. Now in its second edition, it has been revised and updated throughout and includes new sections on stress response, Mycobacterium spp., risk analysis and new foodborne health problems such as BSE. Food Microbiology covers the three main aspects of interaction between micro-organisms and food - spoilage, foodborne illness and fermentation - and the positive and negative features that result. It discusses the factors affecting the presence of micro-organisms in food and their capacity to survive and grow. Also included are recent developments in procedures used to assay and control the microbiological quality of food. Food Microbiology presents a thorough and accessible account of this increasingly topical subject, and is an ideal text for undergraduate courses in the biological sciences, biotechnology and food science. It will also be valuable as a reference for lecturers and researchers in these areas.

Listeria-Chris Bell 2012-12-06 The independent investigations some 70 years ago by E. G. D. Murray and colleagues in Cambridge (UK) and J.H. H. Pirie in Johannesburg (South Africa) resulted in the first detailed descriptions of listeriosis (in both instances in small animals), together with the isolation and naming of Listeria monocytogenes. These descriptions in 1926 and 1927 show the precision and care of these experimentalists, for not only did they show much skill and attention to detail but also great insight in surmising that the consumption of contaminated food was associated with the transmission of listeriosis. In the words of Pirie in 1927, 'Infection can be produced by subcutaneous inoculation or by feeding and it is thought that it is by feeding that the disease is spread in nature. ' These observations were largely forgotten and listeriosis was regarded as a rather obscure disease of animals and occasionally humans. However, the 1980s saw dramatic changes and the ‘elevation’ of Listeria to a topic of concern not only amongst microbiologists (particularly food microbiologists) but also the general public.

Statistical aspects of microbiological criteria related to foods-Food and Agriculture Organization of the United Nations 2019-02-14 Microbiological Criteria have been used in food production and the food regulatory context for many years. While the food-specific aspects of microbiological criteria are well understood, the mathematical and statistical aspects are often less well appreciated, which hinders the consistent and appropriate application of...
microbiological criteria in the food industry. This document has been developed to begin redressing this situation. A particular aim of this document is to illustrate the important mathematical and statistical aspects of microbiological criteria, but with minimal statistical jargon, equations and mathematical details. It is hoped that the resulting document and support materials make this subject more accessible to a broad audience. This volume and others in this Microbiological Risk Assessment Series contain information that is useful to both food safety risk assessors and risk managers, the Codex Alimentarius Commission, governments and regulatory agencies, food producers and processors and other institutions and individuals with an interest in Microbiological Criteria. This volume in particular aims to support food business operators, quality assurance managers, food safety-policy makers and risk managers.

Irradiation for Quality Improvement, Microbial Safety and Phytosanitation of Fresh Produce - Rivka Barkai-Golan 2017-06-07

Irradiation for Quality Improvement, Microbial Safety and Phytosanitation of Fresh Produce presents the last six and a half decades of scientific information on the topic. This book emphasizes proven advantages of ionizing irradiation over the commonly used postharvest treatments for improving postharvest life of fresh fruits and vegetables to enhance their microbial safety. This reference is intended for a wide range of scientists, researchers, and students in the fields of plant diseases and postharvest diseases of fruits and vegetables. It is a means for disease control to promote food safety and quality for the food industry and can be used in food safety and agriculture courses. Discusses pathogen resistance to common chemical synthetic compounds Presents up-to-date research and benefits of phytosanitary irradiation Includes comprehensive research for alternative treatments for postharvest disease control Provides the non-residual feature of ionizing radiation as a physical means for disease control to produce chemical free foods

Production and Processing of Healthy Meat, Poultry and Fish Products - A.M. Pearson 2013-03-09

The central theme for this volume was chosen since consumers have great interest in purchasing low fat, low salt and reduced cholesterol meat, poultry and fish products. As in past volumes, experts in the field have been chosen to write chapters with emphasis on their breadth of knowledge in each specific area. Efforts were also made to obtain authors from different countries in order to give the book a worldwide perspective. Chapter I stresses the nutritional and sensory properties that meat, poultry and fish products make to healthful diets and discusses consumer concerns about these products. Chapter 2 covers dietary recommendations in major consumer nations, along with data from food composition tables and the dietary contributions of meat, poultry and fish to meeting dietary needs. Chapter 3 discusses the labeling of low and reduced fat/salt products which, although written mainly from the US viewpoint, may serve as a model for labeling in other countries. Chapter 4 reviews the rationale for reducing fat-energy levels in muscle foods, problems encountered in their

Microbial Safety of Lipid-based Ready-to-use Foods for Management of Moderate Acute Malnutrition and Severe Acute Malnutrition - 2021 The FAO/WHO expert meeting held in December 2014 considered microbial contamination of lipid-based ready-to-use foods (RUFs) and the risk of foodborne infections in the malnourished population of children that consume RUFs. The goals of the expert meeting were to: review the status of the microbiological safety of lipid-based RUFs used to manage moderate acute malnutrition and severe acute malnutrition; conduct a comprehensive risk assessment; provide guidance to producers on the general approach and requirements for manufacturing RUFs that are safe for their intended use; and provide guidance to the agencies that purchase RUFs on how best to judge their microbiological safety. The expert committee described three approaches that purchasers of RUFs might use to establish microbiological criteria to assure the safety of RUFs and to communicate to manufacturers their safety expectations. These approaches are: (i) reference to existing standards established for similar low-moisture foods; (ii) determining an acceptable increase in risk over the pre-existing baseline of illness from other sources of exposure; and (iii) process verification sampling using the moving window technique. The microbiological criteria derived by each of these approaches accomplish different purposes, and which is most appropriate is determined by the conditions of manufacture and use.
production and how these may be solved. Chapter 5 discusses the scientific basis for reducing the salt (sodium) content in food products and the health benefits derived from lowering salt intake. Methods of reducing the cholesterol content of these animal products is reviewed in Chapter 6.

Current Topics in Salmonella and Salmonellosis - Mihai Mares 2017-04-05
The genus Salmonella comprises an important number of bacterial species able to colonize and infect numerous animal species and humans. Although more than a hundred years passed since its discovery, Salmonella still represents a redoubtable and successful microorganism, difficult to deal with. Whether we discuss about typhoid fever or food poisoning, the public health and financial consequences are practically incalculable. The costs attributable to Salmonella contamination of meat, eggs, and vegetables are also very high worldwide. Antimicrobial resistance in Salmonella isolates is an emerging threat not only in humans, and special measures should be addressed to this global problem. The book Current Topics in Salmonella and Salmonellosis contains a series of reviews about all-important issues concerning these subjects. It comprises 14 chapters grouped in 4 sections emphasizing new insights into pathogenesis, bacterial detection and antibiotic resistance, infections in animals, risk factors, and control strategies. The new genomic data and the exhaustive presentation of molecular pathogenesis bring novelty to the book and can help to improve our knowledge about Salmonella-induced diseases.

The Microbiological Safety of Food - Betty Constance Hobbs 1973
Bacteriology of various commodities in relation to food poisoning; Epidemiology of food-borne infection in man and animals; Special laboratory techniques; Legislation and non-legal specifications.

Microbiology of Fruits and Vegetables - Gerald M. Sapers 2005-08-29
Fresh and fresh-cut fruits and vegetables have an excellent safety record. However, surveillance data from the U.S. Centers for Disease Control and Prevention and recent foodborne illness outbreaks have demonstrated that the incidence of foodborne illnesses linked to the consumption of contaminated fresh fruit and vegetable products may in fact be