

Lactic Acid Bacteria: Natural Antimicrobial Systems for Food Preservation

FOOD BIOTECHNOLOGY

Natural Antimicrobial Systems And Food Preservation

Israel Goldberg, Richard Williams



Natural Antimicrobial Systems And Food Preservation:

Natural Food Antimicrobial Systems A.S. Naidu, 2000-06-21 Consumer concerns play a critical role in dictating the direction of research and development in food protection. The rising demand for minimally processed foods growing concerns about the use of synthetic preservatives and suspected links between the overuse of antibiotics and multi drug resistance in microbes has made food safety a global priority. Natural Food Antimicrobial Systems focuses on advances in the technology of food safety. Numerous antimicrobial agents exist in animals and plants where they evolved as defense mechanisms. For example, the antimicrobial components of milk have been unraveled in recent years. The book covers how these components such as lactoferrin can be used as multifunctional food additives such as antioxidants and immuno modulating agents. The six sections cover lacto antimicrobials, ovo antimicrobials, phyto antimicrobials, bacto antimicrobials, acid antimicrobials, and milieu antimicrobials. Each chapter provides background and historical information, molecular properties, antimicrobial activity, biological advantage, applications, safety, tolerance, and efficacy, and biotechnology. To satisfy the rapidly changing consumption patterns of the global market, the food processing industry continuously searches for new technologies in food science. Designed as a reference for academia and corporate R D, Natural Food Antimicrobial Systems fills this need offering in depth information on emerging biotechnology, efficacy, and applications of natural food antimicrobial systems. *New Methods of Food Preservation* Grahame W. Gould, 1995-12-31 Index *Natural Antimicrobial Systems and Food Preservation* V. M. Dillon, R. G. Board, 1994 Ecological concepts of food preservation. Lactoperoxidase and lactoferrin. Lysozyme, ovotransferrin, and avidin. Nisin. Bacteriocins of starter culture bacteria. Antimicrobial properties of spices and their essential oils. Antimicrobial compounds in food plants. Antimicrobial properties of vegetable and fish oils. Antimicrobial agents associated with insects. Biocontrol of undesirable microorganisms in food. Future prospects for natural antimicrobial food preservation systems. *Natural Antimicrobials for the Minimal Processing of Foods* S. Roller, 2003-07-01 Consumers demand food products with fewer synthetic additives but with increased safety, quality, and shelf life. These demands have led to renewed interest in the use of natural antimicrobials to preserve foods. However, despite the wide range of potential antimicrobials, relatively few are suitable for use in practice in particular food products. Edited by a leading expert in the field and with a distinguished international team of contributors, *Natural antimicrobials for the minimal processing of foods* discusses their practical application in food preservation, often in conjunction with other preservation techniques. After an introductory chapter, the book first discusses the use of bacteriocins such as nisin in preserving animal and other food products, often in conjunction with other preservation techniques such as high hydrostatic pressure and pulsed electric fields. Subsequent chapters discuss the current and future uses of natamycin, organic acids, antimicrobials from animals, and chitosan as preservatives. Three chapters are devoted to antimicrobials from plants and their use in a wide range of applications, including the preservation of fresh and minimally processed fruits and vegetables. A final group of chapters

discuss the use of natural antimicrobials in edible coatings applications of natural antifungal agents the combination of natural antimicrobials with irradiation and the regulatory context With its practical emphasis and authoritative coverage Natural antimicrobials for the minimal processing of foods is a standard work for the food industry in developing new preservation systems that extend the shelf life of foods without compromising safety or sensory quality Discusses the practical application of antimicrobials in food preservation often in conjunction with other preservation techniques Discusses the uses of natamycin organic acids antimicrobials from animals and chitosan as preservatives A standard work for the food industry in developing new preservation systems that extend the shelf life of foods without compromising safety or sensory quality

Handbook of Food Preservation M. Shafiur Rahman, 2007-07-16 The processing of food is no longer simple or straightforward but is now a highly inter disciplinary science A number of new techniques have developed to extend shelf life minimize risk protect the environment and improve functional sensory and nutritional properties The ever increasing number of food products and preservation techniques cr

Natural Antimicrobials in Food Safety and Quality Mahendra Rai, 2011-02-01 The demands of producing high quality safe pathogen free food rely increasingly on natural sources of antimicrobials to inhibit food spoilage organisms and foodborne pathogens and toxins Discovery and development of new antimicrobials from natural sources for a wide range of application requires that knowledge of traditional sources for food antimicrobials is combined with the latest technologies in identification characterization and application This book explores some novel natural sources of antimicrobials as well as the latest developments in using well known antimicrobials in food

Handbook of Food Preservation Mohammad Shafiur Rahman, 2020-06-10 The processing of food is no longer simple or straightforward but is now a highly inter disciplinary science A number of new techniques have developed to extend shelf life minimize risk protect the environment and improve functional sensory and nutritional properties Since 1999 when the first edition of this book was published it has facilitated readers understanding of the methods technology and science involved in the manipulation of conventional and newer sophisticated food preservation methods The Third Edition of the Handbook of Food Preservation provides a basic background in postharvest technology for foods of plant and animal origin presenting preservation technology of minimally processed foods and hurdle technology or combined methods of preservation Each chapter compiles the mode of food preservation basic terminologies and sequential steps of treatments including types of equipment required In addition chapters present how preservation method affects the products reaction kinetics and selected prediction models related to food stability what conditions need be applied for best quality and safety and applications of these preservation methods in different food products This book emphasizes practical cost effective and safe strategies for implementing preservation techniques for wide varieties of food products Features Includes extensive overview on the postharvest handling and treatments for foods of plants and animal origin Describes comprehensive preservation methods using chemicals and microbes such as fermentation antimicrobials antioxidants pH lowering and nitrite Explains

comprehensive preservation by controlling of water structure and atmosphere such as water activity glass transition state diagram drying smoking edible coating encapsulation and controlled release Describes preservation methods using conventional heat and other forms of energy such as microwave ultrasound ohmic heating light irradiation pulsed electric field high pressure and magnetic field Revised updated and expanded with 18 new chapters the Handbook of Food Preservation Third Edition remains the definitive resource on food preservation and is useful for practicing industrial and academic food scientists technologists and engineers **Food Preservation Techniques** Peter Zeuthen, Leif Bøgh-Sørensen, 2003-10-30 Extending the shelf life of foods whilst maintaining safety and quality is a critical issue for the food industry As a result there have been major developments in food preservation techniques which are summarised in this authoritative collection The first part of the book examines the key issue of maintaining safety as preservation methods become more varied and complex The rest of the book looks both at individual technologies and how they are combined to achieve the right balance of safety quality and shelf life for particular products Provides an authoritative review of the development of new and old food preservation technologies and the ways they can be combined to preserve particular foods Examines the emergence of a new generation of natural preservatives in response to consumer concerns about synthetic additives Includes chapters on natural antimicrobials bacteriocins and antimicrobial enzymes as well as developments in membrane filtration ultrasound and high hydrostatic pressure **Control of Foodborne Microorganisms** Vijay K. Juneja, John N. Sofos, 2001-09-27 Presents the latest research in the control of foodborne pathogens Emphasizes traditional and emerging techniques as well as current applications for the inactivation of microorganisms to reduce illness and enhance food safety and quality **Antimicrobials for Sustainable Food Storage** Naga Raju Maddela, Gusdanis Alberto Campos Garcia, Jaskiran Kaur, 2024-08-13 Finding natural substances is worthwhile in food preservation The principal motivation behind this edited volume Antimicrobials for Sustainable Food Storage is to collect and present widespread knowledge in the domain of sustainable food ingredients with antimicrobial properties The book consists of two sections The first section of this volume is about food ingredients as antimicrobials and the second section discusses the recent advances in the applications of food ingredients Interplay of various environmental factors favors the growth of different microorganisms during the food preservation process Growth of undesirable microorganisms negatively influences the taste smell color and texture of food Therefore sustainable food preservation is a challenging issue Though several chemicals have emerged inevitable health effects are commonly encountered by food preserve chemicals Microbial products nisin enterocin pentosin sakacin and pediocin have immense importance in prolonging the shelf life of food substances by controlling food spoilage and pathogenic microbes Yeasts and cyanobacteria are also potential candidates in the supply of food ingredients with significant antimicrobial properties However limited awareness of antimicrobials as food ingredients and the unavailability of a single source of the latest insights on such food ingredients in one place led to the motivation to produce this work Key

Features Provides insights on natural antimicrobials in food preservation Underlines the importance of sustainable food packaging Offers knowledge on emerging trends in antimicrobial based food storage Diverse applications are covered in different chapters This book covers various antimicrobials as food preservatives such as metabolites natural products essential oils nanomaterials L arginine polyphenols phaeophyceae and horchata There are also chapters that focus on the applicability and prospective studies of essential oils edible biofilms biodegradable antimicrobials and nanostructured lipid carriers in the food sector and the method for encapsulation of antimicrobials *Food Preservatives* Nicholas J.

Russell,Grahame W. Gould,2012-12-06 For centuries man has treated food to prolong its edible life and nowadays both traditional and modern preservatives are used widely to ensure the satisfactory maintenance of quality and safety of foods There continues to be increased public concern about the use of food additives including preservatives resulting from a perception that some of them may have deleterious effects on health However as eating habits have changed with an emphasis on what has been popularly termed a healthy diet there is at the same time a concern that reduction in preservative usage could lead to loss of safety and protection from food poisoning While some preservatives are coming under increasing regulatory pressure others particularly more natural ones are receiving increased attention and gaining in importance and acceptability This book supports the continued safe and effective use of preservatives within these current constraints It therefore gives detailed information on the practical use of the major antimicrobial preservatives Uniquely it couples this with current understanding of their modes of action at the levels of cellular physiology and biochemistry in such a way as to provide a sound scientific basis for their efficacy Such an approach also encourages the future logical development and use of preservatives **New Issues in Food Policy, Control and Research** Arthur P. Riley,2007 This book examines in detail food policy control and research

Antimicrobials in Food P. Michael Davidson,John N. Sofos,A. Larry Branen,2005-04-28 Twelve years have passed since its last edition making Antimicrobials in Foods Third Edition the must have resource for those interested in the latest information on food antimicrobials During that time complex issues regarding food preservation and safety have emerged A dozen years ago major outbreaks of Escherichia coli O157 H7 and Listeri *Biotechnology and Food Ingredients* Israel Goldberg,Richard Williams,1991-02-28 Reviews the successful cases of developing food ingredients by biotechnological processes as a sort of catalogue for people in the food industry Describes the production of proteins vitamins enzymes flavors colors and other ingredients using traditional genetic engineering and entirely new technologies Chapters discuss the various products and sources methodologies and regulation Annotation copyrighted by Book News Inc Portland OR Microbiological Safety and Quality of Food Barbara M. Lund,Tony C. Baird-Parker,Grahame W. Gould,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

Protective Cultures, Antimicrobial Metabolites and Bacteriophages for Food and Beverage Biopreservation C. Lacroix, 2010-11-29 Consumers favour foods with fewer synthetic additives but products must also be safe to eat and have a sufficiently long shelf life Biopreservation the use of a product's natural microflora and its antibacterial products for protection against pathogens and spoilage is a method of growing interest for the safe production of high quality minimally processed foods This book provides an essential overview of key topics in this area Initial chapters review central aspects in food biopreservation including the identification of new protective cultures and antimicrobial culture components existing commercial fermentates including nisin and natamycin and the potential of novel fermentates and bacteriophages to improve food safety Part II concentrates on the use of protective cultures bacteriocins and bacteriophages to control the carriage of pathogenic microorganisms in food animals and to modulate human gut microflora Chapters in the final section of the book review biopreservation of different types of foods including milk and dairy products fermented meats fresh seafood and fruit A review of active packaging for food biopreservation completes the volume Edited by a leading expert Protective cultures antimicrobial metabolites and bacteriophages for food and beverage biopreservation is a fundamental reference for researchers and food industry professionals working to ensure the safety of the food supply Reviews the central aspects in food biopreservation including the identification of new protective cultures and antimicrobial culture components Examines the use of protective cultures bacteriocins and bacteriophages to control the carriage of pathogenic microorganisms Provides an overview of the biopreservation of different types of foods including milk and dairy products fermented meats fresh seafood and fruit

Applied Microbiology A. Durieux, J.-P. Simon, 2006-04-11 This book illustrates the major trends in applied microbiology research with immediate or potential industrial applications The papers proposed reflect the diversity of the application fields New microbial developments have been done as well in the food and health sectors than in the environmental technology or in the fine chemical production All the microbial genera are involved yeast fungi and bacteria

The development of biotechnology in parallel with the industrial microbiology has enabled the application of microbial diversity to our socio economical world. The remarkable properties of microbes inherent in their genetic and enzymatic material allow a wide range of applications that can improve our every day life. Recent studies for elucidating the molecular basis of the physiological processes in micro organisms are essential to improve and to control the metabolic pathways to overproduce metabolites or enzymes of industrial interest. The genetic engineering is of course one of the disciplines offering new horizons for the fantastic microbial factory. Studies of the culture parameter incidence on the physiology and the morphology are essential to control the response of the micro organisms before its successful exploitation at the industrial scale. For this purpose fundamental viewpoints are necessary. Development of novel approaches to characterise micro organisms would also facilitate the understanding of the inherent metabolic diversity of the microbial world in terms of adaptation to a wide range of biotopes and establishment of microbial consortia.

Hurdle Technologies: Combination Treatments for Food Stability, Safety and Quality Lothar Leistner, Grahame W. Gould, 2012-12-06. Hurdle Technologies Combination Treatments for Food Stability Safety and Quality is the first work on hurdle technology in which all aspects the possibilities and limitations of hurdle technology are comprehensively outlined and evaluated. World renowned on the subject Leistner and Gould were instrumental in the development of the hurdle technology concept and in the last decades have obtained much practical experience in the application of this successful approach in the food industry worldwide.

Advances in Food Mycology Ailsa D. Hocking, John I. Pitt, Robert A. Samson, Ulf Thrane, 2006-08-29. This book represents the Proceedings of the Fifth International Workshop on Food Mycology which was held on the Danish island of Sams from 15-19 October 2003. This series of Workshops commenced in Boston USA in July 1984 from which the proceedings were published as *Methods for Mycological Examination of Food* edited by A D King et al published by Plenum Press New York 1986. The second Workshop was held in Baarn the Netherlands in August 1990 and the proceedings were published as *Modern Methods in Food Mycology* edited by R A Samson et al and published by Elsevier Amsterdam 1992. The Third Workshop was held in Copenhagen Denmark in 1994 and the Fourth near Uppsala Sweden in 1998. The proceedings of those two workshops were published as scientific papers in the *International Journal of Food Microbiology*. International Workshops on Food Mycology are held under the auspices of the International Commission on Food Mycology a Commission under the Mycology Division of the International Union of Microbiological Societies. Details of this Commission are given in the final chapter of this book. This Fifth Workshop was organised by Ulf Thrane, Jens Frisvad, Per V Nielsen and Birgitte Andersen from the Center for Microbial Biotechnology Technical University of Denmark Kgs Lyngby. vi Foreword Denmark.

Understanding Pathogen Behaviour M. Griffiths, 2005-07-30. Pathogens respond dynamically to their environment. Understanding their behaviour is critical both because of evidence of increased resistance to established sanitation and preservation techniques and because of the increased use of minimal processing technologies which are more vulnerable to

the development of resistance Understanding pathogen behaviour summarises the wealth of recent research and its implications for the food industry After two introductory chapters on ways of analysing and modelling pathogens Part one summarises current research on what determines pathogenicity stress response adaptation and resistance Part two reviews the behaviour of particular pathogens reviewing virulence stress response and resistance mechanisms in such pathogens as Salmonella E coli and Campylobacter The final part of the book assesses how pathogens react and adapt to particular stresses from heat treatment and the effects of low temperature to the use of disinfectants and sanitisers With its distinguished editor and international team of contributors Understanding pathogen behaviour is a standard reference for the food industry in ensuring food safety Summarises the wealth of recent research in pathogen behaviour Assesses implications for microbiologists and QA staff in the food industry

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