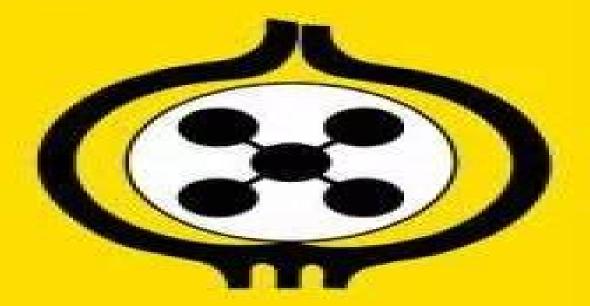
Developments in Food Science

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# NOVEL MACROMOLECULES IN FOOD SYSTEMS

G. DOXASTAKIS and V. KIOSSEOGLOU



ELSEVIER

# **Novel Macromolecules In Food Systems**

Sabu Thomas, Rajendran Rajakumari, Anne George, Nandakumar Kalarikkal

#### **Novel Macromolecules In Food Systems:**

Novel Macromolecules in Food Systems G. Doxastakis, V. Kiosseoglou, 2000-10-02 Applying recent advances in biological and physical sciences food scientists have created novel food ingredients enzymatically chemically or microbiologically Chief among these are novel proteins and polysaccharides which like the more established traditional macromolecules can perform multifunctional roles such as thickening stabilization gelation or encapsulation and in this way determine to a large extent the shelf life texture and nutritional value of natural and processed foods Featuring the latest advances on chemistry structure and functional properties of novel proteins and polysaccharides with an emphasis on fundamental structure function relationships this book will be valuable to all those working in product development and fundamental food research

Food Polysaccharides and Their Applications Alistair M. Stephen, Glyn O. Phillips, 2016-04-19 Comprehensive in scope Food Polysaccharides and Their Applications Second Edition explains the production aspects and the chemical and physical properties of the main classes of polysaccharaides consumed as food highlighting their nutritional value and their technological characteristics Chapters in this new edition detail the source Handbook of Food Science, Technology, and Engineering Yiu H. Hui,2006 Innovative and Emergina Technologies in the Bio-marine Food Sector Marco Garcia-Vaguero, Gaurav Rajauria, 2021-11-30 Innovative and Emerging Technologies in the Bio marine Food Sector Applications Regulations and Prospects presents the use of technologies and recent advances in the emerging marine food industry Written by renowned scientists in the field the book focuses primarily on the principles of application and the main technological developments achieved in recent years It includes technological design equipment and applications of these technologies in multiple processes Extraction preservation microbiology and processing of food are extensively covered in the wide context of marine food products including fish crustaceans seafood processing waste seaweed microalgae and other derived by products This is an interdisciplinary resource that highlights the potential of technology for multiple purposes in the marine food industry as these technological approaches represent a future alternative to develop more efficient industrial processes Researchers and scientists in the areas of food microbiology food chemistry new product development food processing food technology bio process engineers in marine based industries and scientists in marine related areas will all find this a novel resource Presents novel innovative technologies in the Bio marine food sector including principles equipment advantages disadvantages and future technological prospects Explores multi purpose uses of technologies for extraction functional food generation food preservation food microbiology and food processing Provides industrial applications tailored for the marine biological market to foster new innovative applications and regulatory requirements

Handbook of Hydrocolloids Glyn O. Phillips, Peter A. Williams, 2020-11-06 Handbook of Hydrocolloids Third Edition is a must have substantive reference on hydrocolloids helping food industry scientists ever since its first edition was published and well received This thoroughly updated and expanded edition reviews the structure function properties and applications

of a broad range of hydrocolloids used in food and related industries The third edition updates existing chapters on developments and theories on the structure and functional characteristics of individual hydrocolloids The book provides additional chapters on new techniques for the chemical and physicochemical characterization of hydrocolloids and applications technologies for encapsulation and controlled release of active compounds Edited by two leading international authorities in the field this third edition continues to be relevant to food industry researchers food manufacturers graduate and postgraduate students particularly in food pharmaceutical and cosmetic sciences Introduces to food hydrocolloids considering regulatory aspects and functional characteristics Examines the manufacture structure function and applications of over twenty five hydrocolloids Brings a detailed overview of the function of hydrocolloids as emulsifiers rheological modifiers film formers and encapsulation agents **Engineering Aspects of Food Emulsification and Homogenization** Marilyn Rayner, Petr Dejmek, 2015-04-24 Emulsions are found in a wide variety of food products pharmaceuticals paints and cosmetics thus emulsification is a truly multidisciplinary phenomenon Therefore understanding of the process must evolve from the combination of at least three different scientific specializations Engineering Aspects of Food Emulsification and Homogenization d Microbial Production of Food Ingredients, Enzymes and Nutraceuticals Brian McNeil, David Archer, Ioannis Giavasis, Linda Harvey, 2013-03-21 Bacteria yeast fungi and microalgae can act as producers or catalysts for the production of food ingredients enzymes and nutraceuticals With the current trend towards the use of natural ingredients in foods there is renewed interest in microbial flavours and colours food bioprocessing using enzymes and food biopreservation using bacteriocins Microbial production of substances such as organic acids and hydrocolloids also remains an important and fast changing area of research Microbial production of food ingredients enzymes and nutraceuticals provides a comprehensive overview of microbial production of food ingredients enzymes and nutraceuticals Part one reviews developments in the metabolic engineering of industrial microorganisms and advances in fermentation technology in the production of fungi yeasts enzymes and nutraceuticals Part two discusses the production and application in food processing of substances such as carotenoids flavonoids and terponoids enzymes probiotics and prebiotics bacteriocins microbial polysaccharides polyols and polyunsaturated fatty acids Microbial production of food ingredients enzymes and nutraceuticals is an invaluable guide for professionals in the fermentation industry as well as researchers and practitioners in the areas of biotechnology microbiology chemical engineering and food processing Provides a comprehensive overview of microbial flavours and colours food bioprocessing using enzymes and food biopreservation using bacteriocins Begins with a review of key areas of systems biology and metabolic engineering including methods and developments for filamentous fungi Analyses the use of microorganisms for the production of natural molecules for use in foods including microbial production of food flavours and carotenoids Handbook of Food Proteins Glyn O. Phillips, Peter A. Williams, 2011-09-09 Traditionally a source of nutrition proteins are also added to foods for their ability to form gels and stabilise emulsions among other

properties The range of specialised protein ingredients used in foods is increasing Handbook of food proteins provides an authoritative overview of the characteristics functionalities and applications of different proteins of importance to the food industry in one convenient volume The introductory chapter provides an overview of proteins and their uses in foods The following chapters each focus on a particular protein ingredient or group of ingredients covering their origins production properties and applications. The proteins discussed are caseins whey proteins gelatin and other meat derived protein ingredients seafood proteins egg proteins soy proteins pea and other legume proteins mycoprotein wheat gluten canola and other oilseed proteins algal proteins and potato protein A chapter on texturised vegetable proteins completes the volume Innovative products and potential methods for improving nutrition and diet using these proteins are described With its distinguished editors and international team of expert contributors Handbook of food proteins is an invaluable reference tool for professionals using food protein ingredients for both food and other applications An authoritative overview of the characteristics functionalities and applications of different proteins of importance to the food industry Chapters each focus on a particular protein ingredient or group of ingredients Innovative products and potential methods for improving nutrition and diet using proteins is also described Improving and Tailoring Enzymes for Food Quality and Functionality Rickey Y. Yada, Derek R. Dee, 2024-03-21 Improving and Tailoring Enzymes for Food Quality and Functionality Second Edition covers the most relevant information demanded in the production engineering and application of enzymes The title is very detailed and is in the important cross field of academia and industry This totally revised new edition covers a broad range of topics related to enzymes and their use in food presenting both the fundamental theory and practical application updated with interesting novel information on biosensors waste valorization up cycling and engineering perspectives besides an increased focus on sustainability Thoroughly updated revision covering a broad range of topics related to enzymes and their use in the food industry Presents both the fundamental theory and recent examples from the literature including the fundamentals of protein folding and enzyme catalysis the preparation of enzymes from natural and recombinant sources immobilizing enzymes and a range of specific food applications Covers new research directions in enzymes thus helping those trying to solve a technical issue or develop a new product **Insects as Food and Food Ingredients** Marco Garcia-Vaquero, Carlos Álvarez García, 2023-11-30 Insects as Food and Food Ingredients Technological Improvements Sustainability and Safety Aspects addresses the use of insects as food by following a farm to fork approach and covering general aspects concerning farming processing and the main applications of insects and insect derived ingredients in the food sector Broken into three sections this book addresses insect farming the challenges of processing whole insects or their fractionation into insect ingredients by the means of conventional and innovative technologies as well as the biological properties application safety functionality and nutritional value of both insects and their ingredients for food applications Nutrition researchers nutritionists food scientists health professionals agricultural researchers biosystem engineers and those working in or

studying related disciplines will benefit from this reference Outlines general concepts related to insect rearing nutritional value safety and sustainability of production for food applications Highlights current and recent advances in full insect and insect ingredients processing using innovative technologies Presents the main applications of insects and their compounds including functional and biological properties when used as food and other promising applications and prospects of insects in the agri food sector Encapsulation Technologies for Active Food Ingredients and Food Processing N.J. Zuidam, Viktor Nedovic, 2009-10-30 Consumers prefer food products that are tasty healthy and convenient Encapsulation is an important way to meet these demands by delivering food ingredients at the right time and right place For example encapsulates may allow flavor retention mask bad tasting or bad smelling components stabilize food ingredients and increase their bioavailability Encapsulation may also be used to immobilize cells or enzymes in the production of food materials or products such as fermentation or metabolite production This book provides a detailed overview of the encapsulation technologies available for use in food products food processing and food production The book aims to inform those who work in academia or R D about both the delivery of food compounds via encapsulation and food processing using immobilized cells or enzymes The structure of the book is according to the use of encapsulates for a specific application Emphasis is placed on strategy since encapsulation technologies may change Most chapters include application possibilities of the encapsulation technologies in specific food products or processes The first part of the book reviews general technologies food grade materials and characterization methods for encapsulates The second part discusses encapsulates of active ingredients e.g. aroma fish oil minerals vitamins peptides proteins probiotics for specific food applications. The last part describes immobilization technologies of cells and enzymes for use within food fermentation processes e g beer wine dairy meat and food production e g sugar conversion production of organic acids or amino acids hydrolysis of triglycerides Edited by two leading experts in the field Encapsulation Technologies for Food Active Ingredients and Food Processing will be a valuable reference source for those working in the academia or food industry. The editors work in both industry or academia and they have brought together in this book contributions from both fields **Chitosan-Based Systems for Biopharmaceuticals** Bruno Sarmento, Jose das Neves, 2012-02-16 Chitosan is a linear polysaccharide commercially produced by the deacetylation of chitin It is non toxic biodegradable biocompatible and acts as a bioadhesive with otherwise unstable biomolecules making it a valuable component in the formulation of biopharmaceutical drugs Chitosan Based Systems for Biopharmaceuticals provides an extensive overview of the application of chitosan and its derivatives in the development and optimisation of biopharmaceuticals The book is divided in four different parts Part I discusses general aspects of chitosan and its derivatives with particular emphasis on issues related to the development of biopharmaceutical chitosan based systems Part II deals with the use of chitosan and derivatives in the formulation and delivery of biopharmaceuticals and focuses on the synergistic effects between chitosan and this particular subset of pharmaceuticals Part III discusses specific applications of chitosan and

its derivatives for biopharmaceutical use Finally Part IV presents diverse viewpoints on different issues such as regulatory manufacturing and toxicological requirements of chitosan and its derivatives related to the development of biopharmaceutical products as well as their patent status and clinical application and potential Topics covered include chemical and technological advances in chitins and chitosans useful for the formulation of biopharmaceuticals physical properties of chitosan and derivatives in sol and gel states absorption promotion properties of chitosan and derivatives biocompatibility and biodegradation of chitosan and derivatives biological and pharmacological activity of chitosan and derivatives biological chemical and physical compatibility of chitosan and biopharmaceuticals approaches for functional modification or crosslinking of chitosan use of chitosan and derivatives in conventional biopharmaceutical dosage forms manufacture techniques of chitosan based microparticles and nanoparticles for biopharmaceuticals chitosan and derivatives for biopharmaceutical use mucoadhesive properties chitosan based systems for mucosal delivery of biopharmaceuticals chitosan based delivery systems for mucosal vaccination chitosan based nanoparticulates for oral delivery of biopharmaceuticals chitosan based systems for ocular delivery of biopharmaceuticals chemical modification of chitosan for delivery of DNA and siRNA target specific chitosan based nanoparticle systems for nucleic acid delivery functional PEGylated chitosan systems for biopharmaceuticals stimuli sensitive chitosan based systems for biopharmaceuticals chitosan copolymers for biopharmaceuticals application of chitosan for anti cancer biopharmaceutical delivery chitosan based biopharmaceuticals scaffolds in tissue engineering and regenerative medicine wound healing properties of chitosan and its use in wound dressing biopharmaceuticals toxicological properties of chitosan and derivatives for biopharmaceutical applications regulatory status of chitosan and derivatives patentability and intellectual property issues quality control and good manufacturing practice preclinical and clinical use of chitosan and derivatives for biopharmaceuticals Chitosan Based Systems for Biopharmaceuticals is an important compendium of fundamental concepts practical tools and applications of chitosan based biopharmaceuticals for researchers in academia and industry working in drug formulation and delivery biopharmaceuticals medicinal chemistry pharmacy bioengineering and new materials development **Innovative Food** Science and Emerging Technologies Sabu Thomas, Rajendran Rajakumari, Anne George, Nandakumar Kalarikkal, 2018-09-03 This volume covers many new trends and developments in food science including preparation characterization morphology properties and recyclability The volume considers food quality shelf life and manufacturing in conjunction with human nutrition diet and health as well as the ever growing demand for the supply and production of healthier foods Distinguished scientists specializing in various disciplines discuss basic studies applications recent advances difficulties and breakthroughs in the field The volume includes informative discussions and new research on food formulations manufacturing techniques biodegradably flexible packaging packaged foods beverages fruits and vegetable processing fisheries milk and milk products frozen food and thermo processing grain processing meat and poultry processing

rheological characteristics of foods heat exchangers in the food industry food and health including natural cures and food supplements spice and spice processing and more Functional Food Carbohydrates Costas G. Biliaderis, Marta S. Izydorczyk, 2006-10-10 Functional Food Carbohydrates presents comprehensive coverage of a broad range of physiologically active carbohydrate compounds and their roles in the promotion of health and the prevention of disease It provides the most up to date information available on the chemistry physical properties processing effects production and physiological function of these food constituents The volume discusses the specific classes of carbohydrates in foods that seem to exert health enhancing effects based on clinical and or epidemiological studies and reviews the physiological and metabolic roles that different carbohydrates have in disease prevention and management focusing on chronic diseases Chemical Technology and the Environment, 2 Volume Set Wiley, 2007-05-21 The two volume reference work Chemical Technology and the Environment provides readers with knowledge on contemporary issues in environmental pollution prevention and control as well as regulatory health and safety issues as related to chemical technology It introduces and expands the knowledge on emerging green materials and processes and greener energy technology as well as more general concepts and methodology including sustainable development and chemistry and green chemistry Based on Wiley s renowned Kirk Othmer Encyclopedia of Chemical Technology this compact reference features the same breadth and quality of coverage and clarity of presentation found in the original Functional Ingredients from Algae for Foods and Nutraceuticals Herminia Dominguez, 2013-09-30 Algae have a long history of use as foods and for the production of food ingredients There is also increasing interest in their exploitation as sources of bioactive compounds for use in functional foods and nutraceuticals Functional ingredients from algae for foods and nutraceuticals reviews key topics in these areas encompassing both macroalgae seaweeds and microalgae After a chapter introducing the concept of algae as a source of biologically active ingredients for the formulation of functional foods and nutraceuticals part one explores the structure and occurrence of the major algal components Chapters discuss the chemical structures of algal polysaccharides algal lipids fatty acids and sterols algal proteins phlorotannins and pigments and minor compounds Part two highlights biological properties of algae and algal components and includes chapters on the antioxidant properties of algal components anticancer agents derived from marine algae anti obesity and anti diabetic activities of algae and algae and cardiovascular health Chapters in part three focus on the extraction of compounds and fractions from algae and cover conventional and alternative technologies for the production of algal polysaccharides Further chapters discuss enzymatic extraction subcritical water extraction and supercritical CO2 extraction of bioactives from algae and ultrasonic and microwave assisted extraction and modification of algal components Finally chapters in part four explore applications of algae and algal components in foods functional foods and nutraceuticals including the design of healthier foods and beverages containing whole algae prebiotic properties of algae and algae supplemented products algal hydrocolloids for the production and delivery of probiotic bacteria and cosmeceuticals from algae Functional ingredients from algae for foods and nutraceuticals is a comprehensive resource for chemists chemical engineers and medical researchers with an interest in algae and those in the algaculture food and nutraceutical industries interested in the commercialisation of products made from algae Provides an overview of the major compounds in algae considering both macroalgae seaweeds and microalgae Discusses methods for the extraction of bioactives from algae Describes the use of algae and products derived from them in the food and nutraceutical industries

Kirk-Othmer Encyclopedia of Chemical Technology, Volume 20 Kirk-Othmer, 2006-04-07 The fifth edition of the Kirk Othmer Encyclopedia of Chemical Technology builds upon the solid foundation of the previous editions which have proven to be a mainstay for chemists biochemists and engineers at academic industrial and government institutions since publication of the first edition in 1949 The new edition includes necessary adjustments and modernisation of the content to reflect changes and developments in chemical technology Presenting a wide scope of articles on chemical substances properties manufacturing and uses on industrial processes unit operations in chemical engineering and on fundamentals and scientific subjects related to the field The Encyclopedia describes established technology along with cutting edge topics of interest in the wide field of chemical technology whilst uniquely providing the necessary perspective and insight into pertinent aspects rather than merely presenting information Set began publication in January 2004 Over 1 000 articles More Marine Proteins and Peptides Se-Kwon Kim, 2013-03-18 Food proteins and than 600 new or updated articles 27 volumes bioactive peptides play a vital role in the growth and development of the body s structural integrity and regulation as well as having a variety of other functional properties Land animal derived food proteins such as collagen and gelatine carry risks of contamination such as BSE Marine derived proteins which can provide equivalents to collagen and gelatin without the associated risks are becoming more popular among consumers because of their numerous health beneficial effects Most marine derived bioactive peptides are currently underutilized While fish and shellfish are perhaps the most obvious sources of such proteins and peptides there is also the potential for further development of proteins and peptides from sources like algae sea cucumber and molluscs Marine derived proteins and peptides also have potential uses in novel products with the possibility of wide commercialization in the food beverage pharmaceutical and cosmetic industries as well as in other fields such as photography textiles leather electronics medicine and biotechnology Marine Proteins and Peptides Biological Activities and Applications presents an overview of the current status future industrial perspectives and commercial trends of bioactive marine derived proteins and peptides Many of the industrial perspectives are drawn from the food industry but the book also refers to the pharmaceutical and cosmetics industries There have recently been significant advances in isolating functional ingredients from marine bio resources and seafood by products for use in these industries but little has been published creating a knowledge gap particularly with regard to the isolation and purification processes This book is the first to fill that gap Marine Proteins and Peptides Biological Activities and Applications is a valuable resource for researchers in

marine biochemistry field as well as food industry managers interested in exploring novel techniques and knowledge on alternative food protein sources It will become a standard reference book for researchers involved in developing marine bio resources and seafood by products for novel nutraceutical cosmetics and pharmaceutical applications It will also appeal to managers and product developers in the food pharmaceutical and cosmetics industries particularly those looking to use marine derived proteins and peptides as substitutes or replacements for unfashionable or outdated food components

More Efficient Utilization of Fish and Fisheries Products M. Sakaguchi,2004-05-18 This international symposium allowed many researchers and industrial representatives to meet and discuss a broad spectrum of information such as zero emission resources availability sustainable utilization of resources bioactive and functional components in aquatic organisms utilization of wastes seafood quality surimi technologies and processing and safety The book aims To provide a current record presented in the international symposium More Efficient Utilization of Fish and Fisheries Products 7 10 October 2001 Kyoto Japan To provide a stimulus to researchers in this area to cross fertilize ideas and demonstrate examples of success To enhance values and returns to fisheries fields in national and international terms by providing descriptions of better techniques and methods for utilizing the catch reducing waste and providing valuable by products Colloid Chemistry Clemens K. Weiss, José Luis Toca-Herrera, 2019-01-15 This book is a printed edition of the Special Issue Colloid Chemistry that was published in Gels

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