

Chemical Changes In Food During Processing Ift Basic Symposium Series

Diet, Nutrition, and Cancer
On Food and Cooking
Essentials and Applications of Food Engineering
Applied Food Protein Chemistry
Physico-Chemical Aspects of Food Processing
Ensuring Safe Food
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Chemical, Structural and Rheological Changes
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Diet, Nutrition, and Cancer

Distributed in Hungary, Albania, Bulgaria, China, Cuba, Czechoslovakia, GDR, Dem People's Rep of Korea, Mongolia, Poland, Roumania, Soviet Union, Dem Rep of Vietnam and Yugoslavia by Avicenum, Czechoslovak Medical Press, Praha The book deals with the chemical reactions taking place in food during industrial processing and storage, and shows how various food components react according to their chemical composition and the influence of other components or processing conditions. The work describes in detail the changes of the main food components (proteins, saccharides, lipids) and of other components important from the standpoint of the nutritional, sensory and hygienic properties of food materials. Important changes of physical properties (which may affect the chemical reactivity) are given as well. The most important reactions are elucidated on examples from technological processes which also show the effect of these chemical reactions on the most important properties of food products.

On Food and Cooking

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Food proteins constitute a diverse and complex collection of biological macro molecules. Although contributing to the nutritional quality of the foods we consume, proteins also act as integral components by virtue of their diverse functional properties. The expression of these functional properties during the preparation, processing and storage of foods is largely dictated by changes to the structure or structure-related properties of the proteins involved. Therefore, germane to the optimal use of existing and future food protein sources is a thorough understanding of the nature of the relationships between structure and function. It is the goal of this book to aid in better defining these relationships. Two distinct sections are apparent: firstly, those chapters which address structure-function relationships using a variety of food systems as examples to demonstrate the intricacies of this relationship, and secondly, those chapters which discuss techniques used to either examine structural parameters or aid in establishing quantitative relationships between protein structure and function. The editors would like to thank all contributors for their assistance, cooperation and, above all, their patience in putting this volume together, and the following companies/organizations for their financial support without which it would not have been the success it was: Ault Foods Limited, Best Foods Canada Limited, Natural Sciences and Engineering Research Council of Canada, Ontario Ministry of Agriculture and Food, Quest International Canada Inc., and University of Guelph. R.Y.Y. R.LJ.

Essentials and Applications of Food Engineering

Biochemistry of Foods attempts to emphasize the importance of biochemistry in the rapidly developing field of food science, and to provide a deeper understanding of those chemical changes occurring in foods. The development of acceptable fruits and vegetables on postharvest storage is dependent on critical biochemical transformations taking place within the plant organ. The chapters discuss how meat and fish similarly undergo postmortem chemical changes which affect their consumer acceptability. In addition to natural changes, those induced by processing or mechanical injury affect the quality of foods. Such changes can be controlled through an understanding of the chemical reactions involved, for instance, in enzymic and nonenzymic browning. Increased sophistication in food production has resulted in the widespread use of enzymes in food-processing operations. Some of the more important enzymes are discussed, with an emphasis on their role in the food industry. The final chapter is concerned with the biodeterioration of foods. The various microorganisms involved in the degradation of proteins, carbohydrates, oils, and fats are discussed, with special reference to the individual biochemical reactions responsible for food deterioration.

Applied Food Protein Chemistry

A large variety of food products all over the world are

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prepared by the fermentation of various raw materials. Fermentation: Effects on Food Properties explores the role of fermentation reactions in the chemical, functional, and sensory properties of food components as well as their effect on food component content and biological activity. Emphasizing the various chemical changes that take place during processing, both pre- and post-fermentation, the book explores: The complex microbial community in fermented foods The generation of the flavor and aroma compounds in fermented foods The effect of fermentation on the rheological properties and the color of foods The effect of fermentation on bioactivities of foods How microorganisms during fermentation can remove or detoxify antinutritional compounds in raw foods The fortification of products derived from fermentation processes and technical issues in the production and distribution of such foods Fermentation processes for cereals, legumes, vegetables, dairy products, seafood, and meat Food safety and adherence to the Hazard Analysis and Critical Control Points (HACCP) principles Mastering today's art of fermentation processes requires detailed knowledge of food raw materials, microbiology, enzymology, chemistry/biochemistry, physics, engineering, and technology. This volume is an important starting point in understanding the process. Presented in concise, accessible chapters contributed by food experts, the book contains ample references to enhance further, more detailed exploration of this critical topic as we search for ways to enhance food quality for better health.

Physico-Chemical Aspects of Food Processing

This book serves as a general introduction to food science and technology, based on the academic courses presented by the authors as well as their personal research experiences. The authors' main focus is on the biological and physical-chemical stabilization of food, and the quality assessment control methods and normative aspects of the subsequent processes. Presented across three parts, the authors offer a detailed account of the scientific basis and technological knowledge needed to understand agro-food transformation. From biological analyses and process engineering, through to the development of food products and biochemical and microbiological changes, the different parts cover all aspects of the control of food quality.

Ensuring Safe Food

Physical and chemical interactions between various constituents resulting from processing operations often lead to physical, sensory, and nutritional changes in foods. Combining important information on processing and food quality, *Physicochemical Aspects of Food Engineering and Processing* describes the effects of various processing technologies on quality changes of different major foods in an integrative manner. Written by Physicochemical Experts in Food Engineering & Processing Part I critically reviews the physicochemical property changes of different foods undergoing selected

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processes, such as microencapsulation, frying, microwave-assisted thermal processing, high-pressure processing, pulsed electric field processing, and freezing. This section also includes a chapter on the effects of various processing technologies on microbial growth and inactivation. Part II focuses on multiphase food systems made of proteins, seafoods, red meats, and pet foods, and the physicochemical changes they undergo when being processed. *Physicochemical Aspects of Food Engineering and Processing* covers the engineering, processing, and quality angles equally. It is an extremely useful resource for academic and industrial researchers seeking an up-to-date overview of the increasingly important combination of both sides of food research and development.

Cooking for Geeks

This SpringerBrief explains the importance of Maillard reactions in food processing. It underlines that the term “Maillard reaction” actually does not describe one single chemical reaction, but an entire class of chemical reactions, which lead to browning, with a strong impact on visual appearance, odor, and flavor. It emphasizes that the Maillard reactions are still not fully characterized, despite extensive historical studies. While under the right conditions Maillard reactions have many favorable effects (e.g. formation of antioxidants), the Brief discusses that there are also conditions where Maillard reactions can result in toxic or mutagenic reactions. Hence, it emphasizes that the reaction should be viewed as a complex

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network of various sub-reactions, with a plethora of concomitant reaction mechanisms and kinetics. This Brief thus makes a step toward a holistic evaluation of the complexity of the Maillard reaction scheme, with the aim of making better and more targeted use in food processing.

Food Quality and Shelf Life

Chemical Changes During Processing and Storage of Foods: Implications for Food Quality and Human Health presents a comprehensive and updated discussion of the major chemical changes occurring in foods during processing and storage, the mechanisms and influencing factors involved, and their effects on food quality, shelf-life, food safety, and health. Food components undergo chemical reactions and interactions that produce both positive and negative consequences. This book brings together classical and recent knowledge to deliver a deeper understanding of this topic so that desirable alterations can be enhanced and undesirable changes avoided or reduced. Chemical Changes During Processing and Storage of Foods provides researchers in the fields of food science, nutrition, public health, medical sciences, food security, biochemistry, pharmacy, chemistry, chemical engineering, and agronomy with a strong knowledge to support their endeavors to improve the food we consume. It will also benefit undergraduate and graduate students working on a variety of disciplines in food chemistry Offers a comprehensive overview of the major chemical changes that occur in foods at the molecular level and

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discusses the positive and negative effects on food quality and human health Describes the mechanisms of these chemical changes and the factors that impede or accelerate their occurrence Helps to solve daily industry problems such as loss of color and nutritional quality, alteration of texture, flavor deterioration or development of off-flavor, loss of nutrients and bioactive compounds or lowering of their bioefficacy, and possible formation of toxic compounds

Advances in Food Dehydration

Food proteins are of great interest, not only because of their nutritional importance and their functionality in foods, but also for their detrimental effects.

Although proteins from milk, meats (including fish and poultry), eggs, cereals, legumes, and oilseeds have been the traditional sources of protein in the human diet, potentially any proteins from a biological source could serve as a food protein. The primary role of protein in the diet is to provide the building materials for the synthesis of muscle and other tissues, and they play a critical role in many biological processes. They are also responsible for food texture, color, and flavor. Today, food proteins are extracted, modified, and incorporated into processed foods to impart specific functional properties. They can also have adverse effects in the diet: proteins, such as walnuts, pecans, almonds, and cashews, soybean, wheat, milk, egg, crustacean, and fish proteins can be powerful allergens for some people. Applied Food Protein Chemistry is an applied reference which reviews the

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properties of food proteins and provides in-depth information on important plant and animal proteins consumed around the world. The book is grouped into three sections: (1) overview of food proteins, (2) plant proteins, and (3) animal proteins. Each chapter discusses world production, distribution, utilization, physicochemical properties, and the functional properties of each protein, as well as its food applications. The authors for each of the chapters are carefully selected experts in the field. This book will be a valuable reference tool for those who work on food proteins. It will also be an important text on applied food protein chemistry for upper-level students and graduate students of food science programs.

Changing Matter

The only single-source reference on the science of olives and olive oil nutrition and health benefits *Olives and Olive Oil as Functional Foods* is the first comprehensive reference on the science of olives and olive oil. While the main focus of the book is on the fruit's renowned health-sustaining properties, it also provides an in-depth coverage of a wide range of topics of vital concern to producers and researchers, including post-harvest handling, packaging, analysis, sensory evaluation, authentication, waste product utilization, global markets, and much more. People have been cultivating olives for more than six millennia, and olives and olive oil have been celebrated in songs and legends for their life-sustaining properties since antiquity. However, it is

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only within the last several decades that the unique health benefits of their consumption have become the focus of concerted scientific studies. It is now known that olives and olive oil contain an abundance of phenolic antioxidants, as well as the anti-cancer compounds such as squalene and terpenoids. This centerpiece of the Mediterranean diet has been linked to a greatly reduced risk of heart disease and lowered cancer risk. Bringing together contributions from some of the world's foremost experts on the subject, this book: Addresses the importance of olives and olive oil for the agricultural economy and the relevance of its bioactive components to human health Explores the role that olive oil plays in reducing oxidative stress in cells-a well-known risk factor in human health Provides important information about new findings on olive oil and lipids which reviews the latest research Explores topics of interest to producers, processors, and researchers, including the fruit's chemical composition, processing considerations, quality control, safety, traceability, and more Edited by two scientists world-renowned for their pioneering work on olive oil and human health, this book is an indispensable source of timely information and practical insights for agricultural and food scientists, nutritionists, dieticians, physicians, and all those with a professional interest in food, nutrition, and health.

Non-Equilibrium States and Glass Transitions in Foods

The Encyclopedia of Food and Health provides users

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with a solid bridge of current and accurate information spanning food production and processing, from distribution and consumption to health effects. The Encyclopedia comprises five volumes, each containing comprehensive, thorough coverage, and a writing style that is succinct and straightforward. Users will find this to be a meticulously organized resource of the best available summary and conclusions on each topic. Written from a truly international perspective, and covering of all areas of food science and health in over 550 articles, with extensive cross-referencing and further reading at the end of each chapter, this updated encyclopedia is an invaluable resource for both research and educational needs. Identifies the essential nutrients and how to avoid their deficiencies Explores the use of diet to reduce disease risk and optimize health Compiles methods for detection and quantitation of food constituents, food additives and nutrients, and contaminants Contains coverage of all areas of food science and health in nearly 700 articles, with extensive cross-referencing and further reading at the end of each chapter

Phase Transitions in Foods

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

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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

Physicochemical Aspects of Food Engineering and Processing

Food processing is now the biggest industry in the UK and in many other countries. It is also rapidly changing from what was essentially a craft industry, batch processing relatively small amounts of product, to a very highly automated one with continuously operating high speed production lines. In addition, consumers have developed a greater expectation for consistently high standard products and coupled this with demands for such things as a more natural flavour, lower fat etc. The need for an increased knowledge of the scientific principles behind food processing has never been greater. Within the industry itself, increased automation, company diversification and amalgamations etc. have meant that those working in it have often to change their field of operation. Whereas twenty years ago, someone starting work in one branch of the food

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industry could expect, if he or she so desired, to work there all their working lives, this is now seldom the case. This means that a basic knowledge of the principles behind food processing is necessary both for the student at university or college, and for those already in the industry. It is hoped, therefore, that this book will appeal to both, and prove to be a useful reference over a wide range of food processing.

Physicochemical Aspects of Food Engineering and Processing

Food Shelf Life Stability provides a unique approach to understanding this critical subject by examining physical, chemical, and biochemical factors affecting food quality. The first section emphasizes the effects that water activity, glass transition, and plasticization have on temperature, water content, and time-dependant phenomena affecting

Technology of Cereals

How safe is our food supply? Each year the media report what appears to be growing concern related to illness caused by the food consumed by Americans. These food borne illnesses are caused by pathogenic microorganisms, pesticide residues, and food additives. Recent actions taken at the federal, state, and local levels in response to the increase in reported incidences of food borne illnesses point to the need to evaluate the food safety system in the United States. This book assesses the effectiveness of the current food safety system and provides

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recommendations on changes needed to ensure an effective science-based food safety system. Ensuring Safe Food discusses such important issues as: What are the primary hazards associated with the food supply? What gaps exist in the current system for ensuring a safe food supply? What effects do trends in food consumption have on food safety? What is the impact of food preparation and handling practices in the home, in food services, or in production operations on the risk of food borne illnesses? What organizational changes in responsibility or oversight could be made to increase the effectiveness of the food safety system in the United States? Current concerns associated with microbiological, chemical, and physical hazards in the food supply are discussed. The book also considers how changes in technology and food processing might introduce new risks. Recommendations are made on steps for developing a coordinated, unified system for food safety. The book also highlights areas that need additional study. Ensuring Safe Food will be important for policymakers, food trade professionals, food producers, food processors, food researchers, public health professionals, and consumers.

Ultrasound: Advances in Food Processing and Preservation

This title teaches students that everything is made of matter and that physical changes create different forms or states of matter. Examples of these different states are presented in easy-to-understand text. The book also introduces students to the law of

conservation of mass.

Chemical Changes in Food during Processing

Impact of Processing on Food Safety

Harold McGee's *On Food and Cooking* is a kitchen classic. Hailed by *Time* magazine as "a minor masterpiece" when it first appeared in 1984, *On Food and Cooking* is the bible to which food lovers and professional chefs worldwide turn for an understanding of where our foods come from, what exactly they're made of, and how cooking transforms them into something new and delicious. Now, for its twentieth anniversary, Harold McGee has prepared a new, fully revised and updated edition of *On Food and Cooking*. He has rewritten the text almost completely, expanded it by two-thirds, and commissioned more than 100 new illustrations. As compulsively readable and engaging as ever, the new *On Food and Cooking* provides countless eye-opening insights into food, its preparation, and its enjoyment. *On Food and Cooking* pioneered the translation of technical food science into cook-friendly kitchen science and helped give birth to the inventive culinary movement known as "molecular gastronomy." Though other books have now been written about kitchen science, *On Food and Cooking* remains unmatched in the accuracy, clarity, and thoroughness of its explanations, and the intriguing way in which it blends science with the historical evolution of foods and cooking techniques.

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Among the major themes addressed throughout this new edition are: Traditional and modern methods of food production and their influences on food quality The great diversity of methods by which people in different places and times have prepared the same ingredients Tips for selecting the best ingredients and preparing them successfully The particular substances that give foods their flavors and that give us pleasure Our evolving knowledge of the health benefits and risks of foods On Food and Cooking is an invaluable and monumental compendium of basic information about ingredients, cooking methods, and the pleasures of eating. It will delight and fascinate anyone who has ever cooked, savored, or wondered about food.

Eat for Life

For a food product to be a success in the marketplace it must be stable throughout its shelf-life. Quality deterioration due to chemical changes and alterations in condition due to physical instability are not always recognised, yet can be just as problematic as microbial spoilage. This book provides an authoritative review of key topics in this area. Chapters in part one focus on the chemical reactions which can negatively affect food quality, such as oxidative rancidity, and their measurement. Part two reviews quality deterioration associated with physical changes, such as moisture loss, gain and migration, crystallization and emulsion breakdown. Contributions in the following section outline the likely effects on different foods and beverages, including bakery

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products, fruit and vegetables, ready-to-eat meals and wine. With contributions from leaders in their fields, Chemical deterioration and physical instability of food and beverages is an essential reference for R&D and QA staff in the food industry and researchers with an interested in this subject. Examines chemical reactions which can negatively affect food quality and measurement Reviews quality deterioration associated with physical changes such as moisture loss, gain and migration, and crystallization Documents deterioration in specific food and beverage products including bakery products, frozen foods and wine

Extrusion of Metals, Polymers, and Food Products

Chemical and Functional Properties of Food Proteins presents the current state of knowledge on the content of proteins in food structures, the chemical, functional, and nutritive properties of food proteins, the chemical and biochemical modification of proteins in foods during storage and processing, and the mutagenicity and carcinogenicity of nitrogenous compounds. It emphasizes the structure-function relationship as well as the effects of practical conditions applied in food processing on the biochemical and chemical reactions in food proteins and food product quality. The first ten chapters discuss structure-function relationships, methods of analysis of nitrogenous compounds, chemical and enzymatic modifications, nutritive roles, and mutagenicity and carcinogenicity of food proteins.

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The following six chapters describe the proteins of meat and fish, milk, eggs, cereals, legumes, oilseeds and single cell organisms, and present detailed information on the effects of conditions applied in storage and processing on the reactions in proteins and their impact on quality attributes of food products.

Chemistry of Maillard Reactions in Processed Foods

Chemical Deterioration and Physical Instability of Food and Beverages

Non-equilibrium States and Glass Transitions in Foods: Processing Effects and Product Specific Implications presents the tactics needed to understand and control non-equilibrium states and glass transitions in food, an essential element in maintaining the shelf-life and quality of foods. After brief introductory chapters introduce the science behind non-equilibrium states and glass transitions in foods, the book details how glass transition temperature is affected by composition and the ways it influences processability and physico-chemical changes during the storage of foods, also exploring how these effects can be controlled. The second section looks at individual foods, highlighting the implications of non-equilibrium states and glass transitions within these foods.

Maintaining and improving the quality of food is of utmost importance to food companies who have to ensure that the shelf life of their products is as long

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as possible. A large amount of research has been performed into glass transitions in food over the last few years, however there has not been a comprehensive review. This book fills that gap.

Provides the only book on the market that covers non-equilibrium states and glass transitions in food from a practical standpoint Presents food industry professionals in the area of food quality with essential information on the effects of glass transitions and non-equilibrium states on the shelf life of specific products Edited by global leaders in glass transition technology in foods

Handbook of Food Science and Technology 1

Essentials & Applications of Food Engineering provides a comprehensive understanding of food engineering operations and their practical and industrial utility. It presents pertinent case studies, solved numerical problems, and multiple choice questions in each chapter and serves as a ready reference for classroom teaching and exam preparations. The first part of this textbook contains the introductory topics on units and dimensions, material balance, energy balance, and fluid flow. The second part deals with the theory and applications of heat and mass transfer, psychrometry, and reaction kinetics. The subsequent chapters of the book present the heat and mass transfer operations such as evaporation, drying, refrigeration, freezing, mixing, and separation. The final section focuses on the thermal, non-thermal, and nanotechnology-based

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novel food processing techniques, 3D food printing, active and intelligent food packaging, and fundamentals of CFD modeling. Features Features 28 case studies to provide a substantial understanding of the practical and industrial applications of various food engineering operations Includes 178 solved numerical problems and 285 multiple choice questions Highlights the application of mass balance in food product traceability and the importance of viscosity measurement in a variety of food products Provides updated information on novel food processing techniques such as cold plasma, 3D food printing, nanospray drying, electrospraying, and electrospinning The textbook is designed for undergraduate and graduate students pursuing Food Technology and Food Process Engineering courses. This book would also be of interest to course instructors and food industry professionals.

Handbook of Food Chemistry

This handbook is intended to be a comprehensive reference for the various chemical aspects of foods and food products. Apart from the traditional knowledge, this book covers the most recent research and development of food chemistry in the areas of functional foods and nutraceuticals, organic and genetically modified foods, nonthermal food processing as well as nanotechnology. This handbook contains both the basic and advanced chemistry both for food research and its practical applications in various food related industries and businesses. This book is appropriate for undergraduates and

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postgraduates in the academics and professionals from the various disciplines and industries who are interested in applying knowledge of food chemistry in their respective fields.

Culinary Reactions

Extrusion is a very popular manufacturing process, especially because of its versatility in terms of materials and shapes. Representing the vast and multifaceted field of extrusion, this book contains write-ups on latest developments from experts in the field. Part (A) on Metal Extrusion contains chapters on spur gear manufacturing, stiff vacuum extrusion, and indirect extrusion for subsurface tubular expansion. Part (B) on Food and Polymer Extrusion includes chapters on extrusion cooking of functional foods, changes in nutritional properties in extrusion of cereals, physicochemical changes of starch in extrusion of corn flour, extruded aquaculture feed, optimal design of polymer extrusion dies, and extrusion cooking technology for food products.

Olives and Olive Oil as Functional Foods

When you're cooking, you're a chemist! Every time you follow or modify a recipe, you are experimenting with acids and bases, emulsions and suspensions, gels and foams. In your kitchen you denature proteins, crystallize compounds, react enzymes with substrates, and nurture desired microbial life while suppressing harmful bacteria and fungi. And unlike in a laboratory, you can eat your experiments to verify

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your hypotheses. In *Culinary Reactions*, author Simon Quellen Field turns measuring cups, stovetop burners, and mixing bowls into graduated cylinders, Bunsen burners, and beakers. How does altering the ratio of flour, sugar, yeast, salt, butter, and water affect how high bread rises? Why is whipped cream made with nitrous oxide rather than the more common carbon dioxide? And why does Hollandaise sauce call for &“clarified&” butter? This easy-to-follow primer even includes recipes to demonstrate the concepts being discussed, including: &· Whipped Creamsicle Topping—a foam &· Cherry Dream Cheese—a protein gel &· Lemonade with Chameleon Eggs—an acid indicator

Chemical Changes in Food During Processing

"Covers the basic and applied principles of phase/state transitions and analyzes their impact on chemical, physical, and rheological changes occurring in food during processing, preservation, and storage—offering practical insights on the most effective ways to move product development forward. Provides a fundamental understanding of transition phenomena, food components, and products, and unit operations.
"

Encyclopedia of Food and Health

This volume results from the Eighth Basic Symposium held by the Institute of Food Technologists in Anaheim, California on June 8-9, 1984. The theme of

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the symposium was "Chemical Changes in Food during Processing." The speakers included a mix of individuals from academic institutions, governmental agencies, and the food industry. Twenty speakers discussed topics ranging from the basic chemistry relating to food constituents to the more applied aspects of chemical changes in food components during food processing. It was the intent of the organizers to bring together a group of speakers who could address the chemistry of changes in food components during processing from a mechanistic point of view. As a consequence, the proceedings of this symposium emphasize the basic chemistry of changes in food constituents from a generic perspective which is intended to provide the reader with a background to address more specific problems that may arise.

Chemical and Functional Properties of Food Proteins

The contents of this book are the proceedings of the ACS symposium, "Impact of Processing on Food Safety," which was held April 16-17, 1997, at the American Chemical Society National Meeting in San Francisco, CA. This symposium brought together researchers from diverse backgrounds in academia, government, and industry. Twenty speakers discussed topics ranging from the regulatory aspects of food processing to the microbiological and chemical changes in food during processing. The main goal of food processing is to improve the microbial safety of food by destroying pathogenic and spoilage

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organisms. Food processing can also improve food safety by destroying or eliminating naturally occurring toxins, chemical contaminants, and antinutritive factors. Unfortunately, processing can also cause chemical changes that result in the formation of toxic or antinutritive factors. The purpose of this book is to summarize our knowledge of both the beneficial and deleterious effects of processing. Chapter 1 considers the consumer's perceptions about food contaminants and food processing. Chapter 2 summarizes the effects of traditional and nontraditional processing methods on microorganisms in food. Chapters 3-6 review the effects of processing on lipids (fatty acids and cholesterol) in food. Changes in the nutritive value of vitamins and minerals as a result of processing are discussed in chapter 7. Chapter 8 concentrates on how processing reduces the allergenicity of some foods.

Fermentation

Phase Transitions in Foods, Second Edition, assembles the most recent research and theories on the topic, describing the phase and state transitions that affect technological properties of biological materials occurring in food processing and storage. It covers the role of water as a plasticizer, the effect of transitions on mechanical and chemical changes, and the application of modeling in predicting stability rates of change. The volume presents methods for detecting changes in the physical state and various techniques used to analyze phase behavior of biopolymers and food components. It should become

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a valuable resource for anyone involved with food engineering, processing, storage, and quality, as well as those working on related properties of pharmaceuticals and other biopolymers. Contains descriptions of non-fat food solids as "biopolymers" which exhibit physical properties that are highly dependent on temperature, time, and water content Details the effects of water on the state and stability of foods Includes information on changes occurring in state and physicochemical properties during processing and storage The only book on phase and state transitions written specifically for the applications in food industry, product development, and research

Food Shelf Life Stability

This volume results from the Eighth Basic Symposium held by the Institute of Food Technologists in Anaheim, California on June 8-9, 1984. The theme of the symposium was "Chemical Changes in Food during Processing." The speakers included a mix of individuals from academic institutions, governmental agencies, and the food industry. Twenty speakers discussed topics ranging from the basic chemistry relating to food constituents to the more applied aspects of chemical changes in food components during food processing. It was the intent of the organizers to bring together a group of speakers who could address the chemistry of changes in food components during processing from a mechanistic point of view. As a consequence, the proceedings of this symposium emphasize the basic chemistry of

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changes in food constituents from a generic perspective which is intended to provide the reader with a background to address more specific problems that may arise.

Biochemistry of Foods

This book covers application of food microbiology principles into food preservation and processing. Main aspects of the food preservation techniques, alternative food preservation techniques, role of microorganisms in food processing and their positive and negative features are covered. Features subjects on mechanism of antimicrobial action of heat, thermal process, mechanisms for microbial control by low temperature, mechanism of food preservation, control of microorganisms and mycotoxin formation by reducing water activity, food preservation by additives and biocontrol, food preservation by modified atmosphere, alternative food processing techniques, and traditional fermented products processing. The book is designed for students in food engineering, health science, food science, agricultural engineering, food technology, nutrition and dietetic, biological sciences and biotechnology fields. It will also be valuable to researchers, teachers and practising food microbiologists as well as anyone interested in different branches of food.

Bioactive Compounds in Foods

Presents recipes ranging in difficulty with the science and technology-minded cook in mind, providing the

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science behind cooking, the physiology of taste, and the techniques of molecular gastronomy.

Chemical Changes During Processing and Storage of Foods

Results from the National Research Council's (NRC) landmark study Diet and health are readily accessible to nonscientists in this friendly, easy-to-read guide. Readers will find the heart of the book in the first chapter: the Food and Nutrition Board's nine-point dietary plan to reduce the risk of diet-related chronic illness. The nine points are presented as sensible guidelines that are easy to follow on a daily basis, without complicated measuring or calculating--and without sacrificing favorite foods. Eat for Life gives practical recommendations on foods to eat and in a "how-to" section provides tips on shopping (how to read food labels), cooking (how to turn a high-fat dish into a low-fat one), and eating out (how to read a menu with nutrition in mind). The volume explains what protein, fiber, cholesterol, and fats are and what foods contain them, and tells readers how to reduce their risk of chronic disease by modifying the types of food they eat. Each chronic disease is clearly defined, with information provided on its prevalence in the United States. Written for everyone concerned about how they can influence their health by what they eat, Eat for Life offers potentially lifesaving information in an understandable and persuasive way. Alternative Selection, Quality Paperback Book Club

Chemical Changes During Food

Processing

Ultrasound is an emerging technology that has been widely explored in food science and technology since the late 1990s. The book is divided into three main areas. Chapters 1 to 5 focus on the basic principles of ultrasound and how the technology works on microbial cells, enzymes, and the chemistry behind the process. Chapters 6 to 15 cover the application of ultrasound in specific food products and processes, discussing changes on food quality and presenting some innovations in food ingredients and enhancement of unit operations. Finally, Chapters 16 to 20 present some topics about manufacture of ultrasound equipment and simulation of the process, the use of the technology to treat food industry wastewater, and an industry perspective. The laws and regulations concerning emerging technologies, such as ultrasound, are also discussed, including the new Food Safety Modernization Act. Provides a clear and comprehensive panorama of ultrasound technology Contains updated research behind this technology Brings the current tested product and future uses Explores potential future use within the food industry

Phase/State Transitions in Foods, Chemical, Structural and Rheological Changes

Comprehensive Assessment of This Globally Relevant Practice As a centuries-old food preservation method, dehydration technology has advanced significantly in

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the past decades as a result of new methods, sophisticated analytical techniques, and improved mathematical modeling. Providing practical and expert insight from an international panel of experts, *Advances in Food Dehydration* encompasses these revolutionary advances and effectively supplies the knowledge base required to optimize natural resources and reduce energy requirements in order to meet growing demand for low-cost, high-quality food products. Discusses Ways to Best Optimize Natural Resources Under the editorial guidance of food engineering and dehydration authority Cristina Ratti, this resource addresses the three biggest challenges associated with food dehydration: The complex nature of food systems together with the deep structural and physico-chemical changes that foodstuffs undergo during processing The difficulty to define quality in quantitative terms and to develop appropriate control techniques The lack of realistic models and simulations to represent the phenomena The book's well-developed chapters explain the structural and physico-chemical changes that food undergoes during dehydration, while discussing ways to optimize natural resources. In addition to describing non-convectional heating sources such as microwaves, infrared, and radio frequency, the text also examines the impact of drying on nutraceutical compounds, the bases of rehydration of dry food particles and the stresses on microorganisms during drying and their stability during storage. *Advances in Food Dehydration* is a user-friendly volume that concisely links the gamut of dehydration concepts into one cohesive reference. About the Editor: Cristina Ratti, Ph.D., is a food engineering professor in the Soils and

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Agri-Food Engineering Department at the Université Laval (Quebec). She is the coordinator of the Food Engineering Program and a member of the Institute of Nutraceutical and Function Foods (INAF). She has published numerous scientific manuscripts related to her research interests in food dehydration as well as physiochemical and quality properties of foodstuffs related to drying.

Food Product-Package Compatibility

Chemical changes that occur in foods during processing and storage are manifold and might be both desirable and undesirable in nature. While many of the processes are carried out intentionally, there are also certain unwanted changes that naturally occur in food and might have to be controlled. Therefore, efforts are made to devise processing technologies in which desirable attributes of foods are retained and their deleterious effects are minimized. While proteins, lipids and carbohydrates are the main nutrients of food that are affected by processing, it is their interaction with one another, as well as involvement of low-molecular-weight constituents that affects their flavor, color and overall acceptability. Thus, generation of aroma via thermal processing and bioconversion is of utmost importance in food preparation. Furthermore, processing operations must be optimized in order to eliminate or reduce the content of antinutrients that are present in foods and retain their bioactive components. Therefore, while novel processing technologies such as freezing, irradiation, microwaving, high pressure treatment and

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fermentation might be employed, control process conditions in a manner that both the desirable sensory attributes and wholesomeness of foods are safeguarded is essential. Obviously, methodologies should also be established to quantitate the changes that occur in foods as a result of processing. This volume was developed from contributions provided by a group of internationally-recognized lead scientists.

Protein Structure-Function Relationships in Foods

A thoroughly revised edition that encompasses new material including sections dealing with extrusion cooking and the use of cereals for animal feed. The section on industrial uses for cereals has been expanded considerably.

Food Microbiology

Physical and chemical interactions between various constituents resulting from processing operations often lead to physical, sensory, and nutritional changes in foods. Combining important information on processing and food quality, *Physicochemical Aspects of Food Engineering and Processing* describes the effects of various processing technologies on quality changes of different major foods in an integrative manner. Written by Physicochemical Experts in Food Engineering & Processing Part I critically reviews the physicochemical property changes of different foods undergoing selected processes, such as microencapsulation, frying,

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microwave-assisted thermal processing, high-pressure processing, pulsed electric field processing, and freezing. This section also includes a chapter on the effects of various processing technologies on microbial growth and inactivation. Part II focuses on multiphase food systems made of proteins, seafoods, red meats, and pet foods, and the physicochemical changes they undergo when being processed. Physicochemical Aspects of Food Engineering and Processing covers the engineering, processing, and quality angles equally. It is an extremely useful resource for academic and industrial researchers seeking an up-to-date overview of the increasingly important combination of both sides of food research and development.

Process-Induced Chemical Changes in Food

This text examines bioactive compounds as food is processed - covering a wide range of products and examining the response to many different processing operations in regard to positive or negative effects on health.

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