

Chemistry And Technology Of Yoghurt Fermentation

Part I: Fundamentals of ultrasound This part will cover the main basic principles of ultrasound generation and propagation and those phenomena related to low and high intensity ultrasound applications. The mechanisms involved in food analysis and process monitoring and in food process intensification will be shown. Part II: Low intensity ultrasound applications Low intensity ultrasound applications have been used for non-destructive food analysis as well as for process monitoring. Ultrasonic techniques, based on velocity, attenuation or frequency spectrum analysis, may be considered as rapid, simple, portable and suitable for on-line measurements. Although industrial applications of low-intensity ultrasound, such as meat carcass evaluation, have been used in the food industry for decades, this section will cover the most novel applications, which could be considered as highly relevant for future application in the food industry. Chapters addressing this issue will be divided into three subsections: (1) food control, (2) process monitoring, (3) new trends. Part III: High intensity ultrasound applications High intensity ultrasound application constitutes a way to intensify many food processes. However, the efficient generation and application of ultrasound is essential to achieving a successful effect. This part of the book will begin with a chapter dealing with the importance of the design of efficient ultrasonic application systems. The medium is essential to achieve efficient transmission, and for that reason the particular challenges of applying ultrasound in different media will be addressed. The next part of this section constitutes an up-to-date vision of the use of high intensity ultrasound in food processes. The chapters will be divided into four

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sections, according to the medium in which the ultrasound vibration is transmitted from the transducers to the product being treated. Thus, solid, liquid, supercritical and gas media have been used for ultrasound propagation. Previous books addressing ultrasonic applications in food processing have been based on the process itself, so chapters have been divided in mass and heat transport, microbial inactivation, etc. This new book will propose a revolutionary overview of ultrasonic applications based on (in the authors' opinion) the most relevant factor affecting the efficiency of ultrasound applications: the medium in which ultrasound is propagated. Depending on the medium, ultrasonic phenomena can be completely different, but it also affects the complexity of the ultrasonic generation, propagation and application. In addition, the effect of high intensity ultrasound on major components of food, such as proteins, carbohydrates and lipids will be also covered, since this type of information has not been deeply studied in previous books. Other aspects related to the challenges of food industry to incorporate ultrasound devices will be also considered. This point is also very important since, in the last few years, researchers have made huge efforts to integrate fully automated and efficient ultrasound systems to the food production lines but, in some cases, it was not satisfactory. In this sense, it is necessary to identify and review the main related problems to efficiently produce and transmit ultrasound, scale-up, reduce cost, save energy and guarantee the production of safe, healthy and high added value foods.

Previous editions of Yoghurt: Science and Technology established the text as an essential reference underpinning the production of yoghurt of consistently high quality. The book has been completely revised and updated to produce this third edition, which combines coverage of recent developments in scientific understanding with information

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about established methods of best practice to achieve a comprehensive treatment of the subject. General acceptance of a more liberal definition by the dairy industry of the term yoghurt has also warranted coverage in the new edition of a larger variety of gelled or viscous fermented milk products, containing a wider range of cultures. Developments in the scientific aspects of yoghurt covered in this new edition include polysaccharide production by starter culture bacteria and its effects on gel structure, acid gel formation and advances in the analysis of yoghurt in terms of its chemistry, rheology and microbiology. Significant advances in technology are also outlined, for example automation and mechanisation. There has also been progress in understanding the nutritional profile of yoghurt and details of clinical trials involving yoghurts are described. This book is a unique and essential reference to students, researchers and manufacturers in the dairy industry. Includes developments in the understanding of the biochemical changes involved in yoghurt production Outlines significant technological advances in mechanisation and automation Discusses the nutritional value of yoghurt

Novel Food Fermentation Technologies provides a comprehensive overview of innovations in food fermentation technologies and their application. Current novel technologies for microbial culture production and preservation are covered in detail, as are fermentation techniques for the production of bioactives from various food matrices, including food processing by-products and waste. Readers are provided with a close look at thermal and non-thermal technologies applicable to fermented food products. The text covers immobilization, microencapsulation technologies and novel preservation techniques for cultures in fermentation. In-depth studies of high pressure processing, pulsed electric field, power ultrasound and gamma irradiation in fermentation are

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provided in addition to novel thermal and non-thermal technologies and process analytical techniques. A wide variety of fermented products are covered, including meat, marine-based, grain-based, dairy and vegetable-based products. Current technologies for extraction of bioactives are examined, as are current innovations in fermented food packaging. Readers are presented with current and future challenges in food fermentation as well. As a comprehensive reference for food fermentation, this work provides up-to-date insights into emerging fermentation technologies which facilitate the processing of wholesome and safe food products.

Chemistry and Technology of Yoghurt Fermentation Springer Milk is considered as a complete diet for an infant and contains essential nutrients for the development of young mammals. The substances in milk provide energy and antibodies that help protect against infection. Most farmers are paid for the quality and composition of their milk. Whole milk, once approved for use, is pumped into storage silos where it undergoes pasteurization, homogenization, separation, and further processing. Milk is a highly perishable commodity because it is an excellent medium for the growth of microorganisms - particularly bacterial pathogens - that can cause spoilage as well as diseases in consumers. Milk processing allows the preservation of milk for days, weeks, or months and helps to reduce food-borne illness.

This book is the third volume of Advanced Dairy Chemistry, which should be regarded as the second edition of Developments in Dairy Chemistry. Volume 1 of the series, Milk Proteins, was published in 1992 and Volume 2, Milk Lipids, in 1994. Volume 3, on lactose, water, salts and vitamins, essentially updates Volume 3 of Developments in Dairy Chemistry but with some important changes. Five of the eleven chapters are devoted to lactose (its physico-chemical

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properties, chemical modification, enzymatic modification and nutritional aspects), two chapters are devoted to milk salts (physico-chemical and nutritional aspects), one to vitamins and one to overview the flavour of dairy products. Two topics covered in the first editions (enzymes and other biologically active proteins) were transferred to Volume 1 of Advanced Dairy Chemistry and two new topics (water and physico-chemical properties of milk) have been introduced. Although the constituents covered in this volume are commercially less important than proteins and lipids covered in Volumes 1 and 2, they are critically important from a nutritional viewpoint, especially vitamins and minerals, and to the quality and stability of milk and dairy products, especially flavour, milk salts and water. Lactose, the principal constituent of the solids of bovine milk, has long been regarded as essentially worthless and in many cases problematic from the nutritional and technological viewpoints; however, recent research has created several new possibilities for the utilization of lactose.

Agro-industrial Wastes as Feedstock for Enzyme Production: Apply and Exploit the Emerging and Valuable Use Options of Waste Biomass explores the current state-of-the-art bioprocesses in enzyme production using agro-industrial wastes with respect to their generation, current methods of disposal, the problems faced in terms of waste and regulation, and potential value-added protocols for these wastes. It surveys areas ripe for further inquiry as well as future trends in the field. Under each section, the individual chapters present up-to-date and in-depth information on bioprospecting of agro-industrial wastes to obtain enzymes of economic importance. This book covers research gaps, including valorization of fruit and vegetable by-product—a key contribution toward sustainability that makes the utmost use of agricultural produce while employing low-energy and cost-efficient bioprocesses. Written by experts in the field of

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enzyme technology, the book provides valuable information for academic researchers, graduate students, and industry scientists working in industrial-food microbiology, biotechnology, bioprocess technology, post-harvest technology, agriculture, waste management, and the food industry. Addresses key opportunities and challenges in the emerging field of enzyme technology, with an emphasis on energy and bio-based industrial applications Explores the current state of the art bioprocesses in enzyme production using fruit and vegetable wastes with respect to their generation, current methods of disposal, and problems faced in terms of waste and regulation Presents in-depth information on bioprospecting of fruit and vegetable to obtain enzymes of economic importance Delves into environmental concerns and economic considerations related to fruit and vegetable processing by-products

Yogurt in Health and Disease Prevention examines the mechanisms by which yogurt, an important source of micro- and macronutrients, impacts human nutrition, overall health, and disease. Topics covered include yogurt consumption's impact on overall diet quality, allergic disorders, gastrointestinal tract health, bone health, metabolic syndrome, diabetes, obesity, weight control, metabolism, age-related disorders, and cardiovascular health. Modifications to yogurt are also covered in scientific detail, including altering the protein to carbohydrate ratios, adding n-3 fatty acids, phytochemical enhancements, adding whole grains, and supplementing with various micronutrients. Prebiotic, probiotic, and synbiotic yogurt component are also covered to give the reader a comprehensive understanding of the various impacts yogurt and related products can have on human health. Health coverage encompasses nutrition, gastroenterology, endocrinology, immunology, and cardiology Examines novel and unusual yogurts as well as popular and

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common varieties Covers effects on diet, obesity, and weight control Outlines common additives to yogurts and their respective effects Reviews prebiotics, probiotics, and symbiotic yogurts Includes practical information on how yogurt may be modified to improve its nutritive value

V. 1. General aspects -- v. 2. Major cheese groups.

This brief reports about safety protocols in the food producing industry. Hygiene, i.e., the prevention of contamination and microbial infections, is of greatest importance in the industry, as are disinfection techniques, to prevent or to fight microbial contaminations and infections, and practical emerging concerns are centered around these fundamental concerns. The first part focuses on the attempts and possibilities to prevent microbial spreading. Part II discusses disinfection techniques and their risks, advantages and disadvantages. Current industry trends, such as the attempts to substitute chlorine in disinfection, are critically reviewed. In all, this brief volume discusses decision procedures and strategies that are being applied to prevent, reduce and fight microbial spreading. In particular, material that comes into contact with the foods, has to fulfill strict requirements. This aspect is explained in detail, and how little details can have great effects. The brief deals with the important question: is disinfection more an ally or an enemy?

Microorganisms are an integral part of the fermentation process in food products and help to improve sensory and textural properties of the products. As such, it is vital to explore the current uses of microorganisms in the dairy industry. Microbial Cultures and Enzymes in Dairy

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Technology is a critical scholarly resource that explores multidisciplinary uses of cultures and enzymes in the production of dairy products. Featuring coverage on a wide range of topics such as dairy probiotics, biopreservatives, and fermentation, this book is geared toward academicians, researchers, and professionals in the dairy industry seeking current research on the major role of microorganisms in the production of many dairy products.

An advanced text/reference, this book provides an overview of the composition, structure, and functionality of key food components and their effects on food product quality. It emphasizes the mechanisms of reactions of components in food systems during storage and processing and their effects on the quality attributes of food products, including nutrition and sensory attributes. International experts provide concise presentations of the current state of knowledge on the content, structure, chemical reactivity, and functional properties of food components. This second edition includes two new chapters covering chemical composition and structure in foods and probiotics in foods.

Health and nutrition have become global focal points as the population continues to grow exponentially. While providing food for the global population is crucial, it is also necessary to provide options that are nutritious in order to promote healthier lifestyles around the world. Exploring the Nutrition and Health Benefits of Functional Foods provides a comprehensive overview of how dietary nutrition can impact people's lives, prevent disease, and maintain an overall healthier lifestyle.

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Highlighting theoretical and practical attributes of different functional foods and how they are utilized globally, this book is an essential reference for researchers, academics, students, policy makers, government officials, and technology developers. Animal products are good source of disposable income for many small farmers in developing countries. In fact, livestock are often the most important cash crop in many small holder mixed farming systems. Livestock ownership currently supports and sustains the livelihoods of rural poor, who depend partially or fully on livestock for their income and/or subsistence. Human population growth, increasing urbanization and rising incomes are predicted to double the demand for, and production of, livestock products in the developing countries over the next twenty years. The future holds great opportunities for animal production in developing countries. *Animal Sourced Foods for Developing Economies* addresses five major issues: 1) Food safety and nutritional status in developing world; 2) the contribution of animal origin foods in human health; 3) Production processes of animal foods along with their preservation strategies; 4) functional outcomes of animal derived foods; and finally, 5) strategies, issues and policies to promote animal origin food consumption. Animal sourced food contain high biological value protein and important micronutrients required for optimal body functioning but are regarded as sources of fat that contribute to the intake of total and saturated fatty acids in diet. The quality of protein source has a direct influence on protein digestibility, as a greater proportion of higher quality proteins is absorbed and

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becomes available for bodily functions. Animal foods has high quantity and quality of protein that includes a full complement of the essential amino acids in the right proportion. Land availability limits the expansion of livestock numbers in extensive production systems in most regions, and the bulk of the increase in livestock production will come from increased productivity through intensification and a wider adoption of existing and new production and marketing technologies. The significant changes in the global consumption and demand for animal source foods, along with increasing pressures on resources, are having some important implications for the principal production systems. In this book, contributors critically analyze and describe different aspects of animal's origin foods. Each chapter is dedicated to a specific type of food from animal source, its nutritional significance, preservation techniques, processed products, safety and quality aspects on conceptual framework. Special attention is given to explain current food safety scenario in developing countries and contribution of animal derived food in their dietary intake. Existing challenges regarding production, processing and promotion of animal's origin foods are also addressed with possible solutions and strengthening approaches.

Organic molecules are currently being investigated with regard to their application as active components in semiconductor devices. Whereas devices containing organic molecules for the generation of light - organic light emitting diodes (OLED) - have already reached the market (they e.g. display information on mobile phones),

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transistors where organic molecules are used to actively control currents and voltages are still in the development stage. In this book the principle problems related to using organic materials as semiconductors and to construct functioning devices will be addressed. A particular emphasis will be put on the difference between inorganic semiconductors such as Si, Ge and GaAs and organic semiconductors (OSC). The special properties of such soft matter require particular approaches for processing characterization and device implementation, which are quite different from the approach used for conventional semiconductors.

An up-to-date overview of the dynamic field of whey protein utilization *Whey Protein Production, Chemistry, Functionality and Applications* explores the science and technology behind the rapidly increasing popularity of this most versatile of dairy by-products. With its richly nutritious qualities, whey protein has been widely used in the food industry for many years. The last decade has, however, seen manufacturers develop many innovative and exciting new applications for it, both in food and other areas. Taking account of these advances, this insightful work offers a full explanation of the technological and chemical breakthroughs that have made whey protein more in-demand than ever before. Topics covered include manufacturing technologies, thermal and chemical modifications, non-food uses, denaturation and interactions, and more. In its broad scope, the book encompasses: An up-to-date overview of recent developments and new applications
Breakdowns of the chemical, nutritional, and functional

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properties of whey protein
Commentary on the current and future outlooks of the whey protein market
Examinations of the methods and manufacturing technologies that enable whey protein recovery
A full guide to the numerous applications of whey protein in food production and other industries
Whey Protein Production, Chemistry, Functionality and Applications is an unparalleled source of information on this highly adaptable and much sought-after commodity, and is essential reading for food and dairy scientists, researchers and graduate students, and professionals working in the food formulation and dairy processing industries.

Encyclopedia of Food Chemistry is the ideal primer for food scientists, researchers, students and young professionals who want to acquaint themselves with food chemistry. Well-organized, clearly written, and abundantly referenced, the book provides a foundation for readers to understand the principles, concepts, and techniques used in food chemistry applications. Articles are written by international experts and cover a wide range of topics, including food chemistry, food components and their interactions, properties (flavor, aroma, texture) the structure of food, functional foods, processing, storage, nanoparticles for food use, antioxidants, the Maillard and Strecker reactions, process derived contaminants, and the detection of economically-motivated food adulteration. The encyclopedia will provide readers with an introduction to specific topics within the wider context of food chemistry, as well as helping them identify the links between the

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various sub-topics. Offers readers a comprehensive understanding of food chemistry and the various connections between the sub-topics Provides an authoritative introduction for non-specialists and readers from undergraduate levels and upwards Meticulously organized, with articles structured logically based on the various elements of food chemistry

Melding the hands-on experience of producing yogurt and fermented milks over four decades with the latest in scientific research in the dairy industry, editor Chandan and his associate editors have assembled experts worldwide to write *Manufacturing Yogurt and Fermented Milks, 2nd Edition*. This one-of-a-kind resource gives a complete description of the manufacturing stages of yogurt and fermented milks from the receipt of raw materials to the packaging of the products. Information is conveniently grouped under four categories:

- Basic background—History and consumption trends, milk composition characteristics, dairy processing principles, regulatory requirements, laboratory analysis, starter cultures, packaging, and more
- Yogurt manufacture—Fruit preparations and flavoring materials, ingredients, processing principles, manufacture of various yogurt types, plant cleaning and sanitizing, quality assurance, and sensory analysis
- Manufacture of fermented milks—Procedure, packaging and other details for more than ten different types of products
- Health benefits—Functional foods, probiotics, disease prevention, and the health attributes of yogurt and fermented milks

All manufacturing processes are supported by sound scientific, technological, and engineering principles.

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Chemical contaminants are a major concern for the food industry. Chemical contaminants and residues in food provides an essential guide to the main chemical contaminants, their health implications, the processes by which they contaminate food products, and methods for their detection and control. Part one focuses on risk assessment and analytical methods. Gas chromatography and mass spectroscopy techniques for the detection of chemical contaminants and residues are discussed, as are applications of HPLC-MS techniques and cell-based bioassays. Major chemical contaminants are then discussed in part two, including dioxins and polychlorinated biphenyls, veterinary drug and pesticide residues, heat-generated and non-thermally-produced toxicants, D- and cross-linked amino acids, mycotoxins and phycotoxins, and plant-derived contaminants. Finally, part three goes on to explore the contamination of specific foods. Chemical contamination of cereals, red meat, poultry and eggs are explored, along with contamination of finfish and marine molluscs. With its distinguished editor and international team of expert contributors, Chemical contaminants and residues in food is an invaluable tool for all industrial and academic researchers involved with food safety, from industry professionals responsible for producing safe food, to chemical analysts involved in testing the final products. Provides an essential guide to the main chemical contaminants, their health implications, the processes by which they contaminate food products, and methods for their detection and control Sections provide in-depth focus on risk assessment and analytical methods, major

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chemical contaminants, and the contamination of specific foods Chemical contamination of cereals, red meat, poultry and eggs are explored, along with contamination of finfish and marine molluscs

Written by the world's leading scientists and spanning over 400 articles in three volumes, the Encyclopedia of Food Microbiology, Second Edition is a complete, highly structured guide to current knowledge in the field. Fully revised and updated, this encyclopedia reflects the key advances in the field since the first edition was published in 1999 The articles in this key work, heavily illustrated and fully revised since the first edition in 1999, highlight advances in areas such as genomics and food safety to bring users up-to-date on microorganisms in foods.

Topics such as DNA sequencing and E. coli are particularly well covered. With lists of further reading to help users explore topics in depth, this resource will enrich scientists at every level in academia and industry, providing fundamental information as well as explaining state-of-the-art scientific discoveries. This book is designed to allow disparate approaches (from farmers to processors to food handlers and consumers) and interests to access accurate and objective information about the microbiology of foods Microbiology impacts the safe presentation of food. From harvest and storage to determination of shelf-life, to presentation and consumption. This work highlights the risks of microbial contamination and is an invaluable go-to guide for anyone working in Food Health and Safety Has a two-fold industry appeal (1) those developing new functional food products and (2) to all corporations concerned

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about the potential hazards of microbes in their food products

Salt, Fat and Sugar Reduction: Sensory Approaches for Nutritional Reformulation of Foods and Beverages explores salt, sugar, fat and the current scientific findings that link them to diseases. The sensory techniques that can be used for developing consumer appealing nutritional optimized products are also discussed, as are other aspects of shelf life and physicochemical analysis, consumer awareness of the negative nutritional impact of these ingredients, and taxes and other factors that are drivers for nutritional optimization. This book is ideal for undergraduate and postgraduate students and academics, food scientists, food and nutrition researchers, and those in the food and beverage industries. Provides a clear outline of current legislation on global ingredient taxes Demonstrates effective protocols, sensory, multivariate and physico-chemical for salt, fat and sugar reduction Outlines reduction protocols, with and without the use of replacer ingredients for salt, fat and sugar reduction Illustrates the full process chain, consumer to packaging, and the effects of reformulation by reduction of ingredients

Milk has been an important food for man since the domestication of cattle and the adoption of a pastoralist agriculture. It is also the most versatile of the animal-derived food commodities and is a component of the diet in many physical forms. In addition to milk itself, a rural technology evolved which permitted the manufacture of cheese, fermented milks, cream and butter. At a later date, successive advances in technology were exploited

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in the manufacture of ice cream, concentrated and dried milks and, at a later date, of ultra-heat-treated dairy products, new dairy desserts and new functional products. At the same time, however, dairy products have been increasingly perceived as unhealthy foods and a number of high quality dairy substitutes, or analogues, have been developed which have made significant inroads into the total dairy food market.

Paradoxically, perhaps, the technology which, on the one hand, presents a threat to the dairy industry through making possible high quality substitutes offers, on the other hand, an opportunity to exploit new uses for milk and its components and to develop entirely new dairy products. Further, the development of products such as low fat dairy spreads has tended to blur the distinction between the dairy industry and its imitators and further broadened the range of knowledge required of dairy scientists and technologists.

Milk processing is energy intensive and contributes significantly to greenhouse gas (GHG) emissions, with high financial and energy costs found all along the production line and supply chain. Worldwide, the dairy industry has set a goal of reducing GHG emissions and other environmental impacts associated with milk processing. Although the major GHG emissions associated with milk production occur on the farm, most energy usage associated with milk processing occurs at the milk processing plant and afterwards, during refrigerated storage (a key requirement for the transportation, retail and consumption of most milk products). Sustainable alternatives and designs for the

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dairy processing plants of the future are now being actively sought by the global dairy industry, as it seeks to improve efficiency, reduce costs, and comply with its corporate social responsibilities. Emerging Dairy Processing Technologies presents the state of the art research and technologies that might be sustainable replacements for high temperature-short time (HTST) and ultra-high temperature (UHT) milk processing. These technologies include pulsed electric fields, high hydrostatic pressure, high pressure homogenization, ohmic and microwave heating, microfiltration, pulsed light, UV light processing, and carbon dioxide processing. This book is part of Wiley's series IFST Advances in Food Science, which all focus on emerging technologies in various sectors of the food industry. Previously commissioned titles in the series have covered emerging technologies in meat, seafood, and functional foods.

The chemistry and physico-chemical properties of milk proteins are perhaps the largest and most rapidly evolving major areas in dairy chemistry. Advanced Dairy Chemistry-1B: Proteins: Applied Aspects covers the applied, technologically-focused chemical aspects of dairy proteins, the most commercially valuable constituents of milk. This fourth edition contains most chapters in the third edition on applied aspects of dairy proteins. The original chapter on production and utilization of functional milk proteins has been split into two new chapters focusing on casein- and whey-based ingredients separately by new authors. The chapters on denaturation, aggregation and gelation of whey proteins

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(Chapter 6), heat stability of milk (Chapter 7) and protein stability in sterilised milk (Chapter 10) have been revised and expanded considerably by new authors and new chapters have been included on rehydration properties of dairy protein powders (Chapter 4) and sensory properties of dairy protein ingredients (Chapter 8). This authoritative work describes current knowledge on the applied and technologically-focused chemistry and physico-chemical aspects of milk proteins and will be very valuable to dairy scientists, chemists, technologists and others working in dairy research or in the dairy industry.

An in-depth look at new and emerging technologies for non-alcoholic beverage manufacturing The non-alcoholic beverage market is the fastest growing segment of the functional food industry worldwide. Consistent with beverage consumption trends generally, the demand among consumers of these products is for high-nutrient drinks made from natural, healthy ingredients, free of synthetic preservatives and artificial flavor and color enhancers. Such drinks require specialized knowledge of exotic ingredients, novel processing techniques, and various functional ingredients. The latest addition to the critically acclaimed IFST Advances in Food Science series this book brings together edited contributions from internationally recognized experts in their fields who offer insights and analysis of the latest developments in non-alcoholic beverage manufacture. Topics covered include juices made from pome fruits, citrus fruits, prunus fruits, vegetables, exotic fruits, berries, juice blends and non-alcoholic beverages, including grain-based beverages, soups and functional beverages. Waste and by-products generated in juice and non-alcoholic beverage sector are also addressed. Offers fresh insight and analysis of the latest

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developments in non-alcoholic beverage manufacture from leading international experts Covers all product segments of the non-alcoholic beverage market, including juices, vegetable blends, grain-based drinks, and alternative beverages Details novel thermal and non-thermal technologies that ensure high-quality nutrient retention while extending product shelf life Written with the full support of The Institute of Food Science and Technology (IFST), the leading qualifying body for food professionals in Europe Innovative Technologies in Beverage Processing is a valuable reference/working resource for food scientists and engineers working in the non-alcoholic beverage industry, as well as academic researchers in industrial food processing and nutrition.

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 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

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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

This Brief defines reliable correlations between the food packaging design and its chemical features in terms of an 'integrated food product' (the synergistic union composed of the edible content and its container). A good design, as described in this Brief, implies the best choices from a series of possibilities, taking into account economical and commercial influences or limitations in the production and processing chain and the chemical interactions that can arise between the food containers and the contained edible material. This Brief highlights how the different requirements can be combined, while avoiding dangerous food risks originating from the chemical interaction between the container and the product. Different designs are critically analysed with relation to the effect on contained foods. The influences and resulting consequences of different possible food packaging designs are highlighted and discussed in selected case studies for some every-day products (like potato chips).

This volume reflects the huge breadth and diversity in research and the application of industrial and engineering chemistry and cheminformatics. The book presents cutting-edge research developments and new insights that emphasize the vibrancy of industrial and engineering chemistry and cheminformatics today. The first section of the book focuses on new insights in engineering chemistry while the second part looks at the promising future and novel approaches in chemical informatics, which has vast implications for industrial and pharmaceutical applications. Several chapters examine various industrial processes for emerging materials and determine practical use under a wide

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range of conditions, helping to establish what is needed to produce a new generation of materials.

High Temperature Processing of Milk and Milk Products covers many aspects of thermal processing of milk and milk products with particular focus on UHT processing. The book begins with an overview of the major thermal processing technologies: thermisation, pasteurisation, extended-shelf-life (ESL), UHT and in-container sterilisation. It discusses the principles of the technologies, the processing and packaging equipment used, processing issues such as temperature-time profiles, heat stability, fouling and cleaning, and the quality and safety aspects of the products produced. It provides a balance of the engineering aspects of the processes and the chemical, microbiological and sensory aspects of the products. The changes that occur in products during processing and storage, and the related defects which can arise, are central to the book. The discussions of these changes will be an aid to industry personnel in identifying the causes of quality defects in these products and devising measures which can be taken to eliminate or minimise the defects. A unique feature is a chapter on analytical methodologies applicable to thermally processed dairy products. There are also chapters on high-temperature processed products other than white cows' milk, including products based on plant materials, and on non-thermal technologies which may be used in place of or as adjuncts to thermal processing. The book concludes with a chapter outlining some of the challenges with the technologies and treated products, and a compendium of relevant reviews, chapters and books.

This new book, Food Process Engineering and Quality Assurance, provides an abundance of valuable new research and studies in novel technologies used in food processing and quality assurance issues of food. The 750-page book

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gives a detailed technical and scientific background of various food processing technologies that are relevant to the industry. The food process related application of engineering technology involves interdisciplinary teamwork, which, in addition to the expertise of interdisciplinary engineers, draws on that of food technologists, microbiologists, chemists, mechanical engineers, biochemists, geneticists, and others. The processes and methods described in the book are applicable to many areas of the food industry, including drying, milling, extrusion, refrigeration, heat and mass transfer, membrane-based separation, concentration, centrifugation, fluid flow and blending, powder and bulk-solids mixing, pneumatic conveying, and process modeling, monitoring, and control. Food process engineering know-how can be credited with improving the conversion of raw foodstuffs into safe consumer products of the highest possible quality. This book looks at advanced materials and techniques used for, among other things, chemical and heat sterilization, advanced packaging, and monitoring and control, which are essential to the highly automated facilities for the high-throughput production of safe food products. With contributions from prominent scientists from around the world, this volume provides an abundance of valuable new research and studies on novel technologies used in food processing and quality assurance issues. It gives a detailed technical and scientific background of various food processing technologies that are relevant to the industry. Special emphasis is given to the processing of fish, candelilla, dairy, and bakery products. Rapid detection of pathogens and toxins and application of nanotechnology in ensuring food safety are also emphasized. Key features:

- Presents recent research development with applications
- Discusses new technology and processes in food process engineering
- Provides several chapters on candelilla (which is frequently used as a food additive but can

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also be used in cosmetics, drugs, etc.), covering its characteristics, common uses, geographical distribution, and more

This Brief reviews the chemistry behind the production of yoghurt through acidification of milk. It quantifies the changes in physical and chemical properties of yoghurt during fermentation with microbial organisms (such as *Lactobacillus bulgaricus* and *Streptococcus thermophilus*). It has been found that this symbiosis has an optimal development at a temperature of ca. 45°C with the transformation of lactose into lactic acid and small amounts of acetaldehyde, diacetyl and volatile acids. This Brief explains the chemical and physical results of the fermentation process, such as precipitation of proteins and the acid coagulation of milk with a clot formation in the final semi-solid mass. The Brief sheds light on the accomplishments of the fermenting organisms: they are responsible for the biochemical reactions of carbohydrate metabolism, proteolysis, lipolysis and flavour production in the process of yoghurt production. It also briefly reviews formulations and food additives used in the modern yoghurt producing industry.

This Brief explains and discusses honey and its production from a chemical perspective. It outlines why honey is a special and unique food, being produced by bees from the nectar of plants or from secretions of living parts of plants. Although glucose and fructose are the main constituents of honey, its overall composition is far from being simple or uniform: other substances such as organic acids, enzymes, or minerals are found in varying amounts. In this Brief, the author addresses the factors that influence the composition of the honey as well as the consequences that the composition has on properties such as color, crystallization, density, viscosity, or the refractive index. This Brief also introduces some of the most commonly used quality parameters for the

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determination of ageing and/or overheating:

5-hydroxymethylfurfural (HMF) and diastase. Other recently proposed constituents for quality parameters are also mentioned, e.g. 1,2 dicarbonyl compounds (3 deoxyglucosone, methylglyoxal, glyoxal) and furosine, also named 2-furoylmethyl lysine.

Food may be nutritious, visually appealing and easy to prepare but if it does not possess desirable flavors, it will not be consumed. Food Flavors and Chemistry: Advances of the New Millennium primarily focuses on food flavors and their use in foods. Coverage also includes other important topics in food chemistry and production such as analytical methods, packaging, storage, safety and patents. Positive flavor notes are described, including ways of enhancing them in food. Conversely, methods for eliminating and reducing undesirable flavors are also proposed. Packaging aspects of foods, with respect to controlling sensory attributes, appearance and microbiological safety are discussed in detail. There is also a section concentrating on the most recent developments in dairy flavor chemistry. This book will be an important read for all postgraduate students, academics and industrial researchers wanting to keep abreast of food flavors and their chemistry.

THE ONLY SINGLE-SOURCE GUIDE TO THE LATEST SCIENCE, NUTRITION, AND APPLICATIONS OF ALL THE NON-BOVINE MILKS CONSUMED AROUND THE WORLD
Featuring contributions by an international team of dairy and nutrition experts, this second edition of the popular Handbook of Milk of Non-Bovine Mammals provides comprehensive coverage of milk and dairy products derived from all non-bovine dairy species. Milks derived from domesticated dairy species other than the cow are an essential dietary component for many countries around the world. Especially in developing and under-developed countries, milks from

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secondary dairy species are essential sources of nutrition for the humanity. Due to the unavailability of cow milk and the low consumption of meat, the milks of non-bovine species such as goat, buffalo, sheep, horse, camel, Zebu, Yak, mare and reindeer are critical daily food sources of protein, phosphate and calcium. Furthermore, because of hypoallergenic properties of certain species milk including goats, mare and camel are increasingly recommended as substitutes in diets for those who suffer from cow milk allergies. This book: Discusses key aspects of non-bovine milk production, including raw milk production in various regions worldwide Describes the compositional, nutritional, therapeutic, physio-chemical, and microbiological characteristics of all non-bovine milks Addresses processing technologies as well as various approaches to the distribution and consumption of manufactured milk products Expounds characteristics of non-bovine species milks relative to those of human milk, including nutritional, allergenic, immunological, health and cultural factors. Features six new chapters, including one focusing on the use of non-bovine species milk components in the manufacture of infant formula products Thoroughly updated and revised to reflect the many advances that have occurred in the dairy industry since the publication of the acclaimed first edition, Handbook of Milk of Non-Bovine Mammals, 2nd Edition is an essential reference for dairy scientists, nutritionists, food chemists, animal scientists, allergy specialists, health professionals, and allied professionals.

Chemical food safety deals with all aspects of chemical risks in the food chain, predominantly with the biologically active components of food, additives, contaminants and their toxicology. Preventing the contamination of food with problematic chemical compounds requires a thorough understanding of how compounds enter and pass through the

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food production process, in addition to toxicology and risk management. Chemical Food Safety covers the underlying principles and applied science required to understand, analyse and take professional action on food safety problems and questions that call for interventions at a local, national or international level. The text follows food contaminants through the production and processing of plant, fungal, algal and animal foods, including oral exposure and intestinal absorption. Risk assessment is explained in the context of targeted future risk management and risk communication, with a view to assessing, managing and communicating risk in the food chain. Chemical Food Safety is ideal for higher level students as well as those working in the food production industry, consultants and national food authorities.

The book provides a comprehensive description of the principal constituents of milk (water, lipids, proteins, lactose, salts, vitamins) and of the chemical aspects of principal families of dairy products. It also covers applied aspects, such as heat-induced changes and the use of enzymes, and principal physical properties. This concise overview should be of value to all dairy scientists and students.

Water, saccharides, proteins, lipids, minerals, colorants, and additives all contribute to the nutritional value and sensory properties of food. During post harvest storage and processing, these components change and the extent and nature of change depends on the chemical properties of the compounds themselves. Knowledge of the chemistry and bioche

Milk processing is one of the most ancient food technologies, dating back to around 6000 B.C. A huge number of milk products have been developed worldwide, representing a spectacular example of biodiversity and a priceless cultural heritage. After millennia of unanimous appreciation as a pillar of human nutrition, a series of questions about the desirability

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of their wide consumption have been raised. In the light of the growing threat deriving mostly from the spread of veganism and health consciousness, improving milk processing safety and dairy nutritional characteristics, as well as deepening their functional characteristics, are of a primary exigency. This Special Issue contains several articles focusing on this hot topic, all of which add knowledge to the field and supply interesting ideas for developing new products and processes.

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