

Crystallization Processes In Fats And Lipid Systems

This book is an example of a successful and excellent addition to the literature on the topic of Food Production and Industry within the scientific world. The book is divided into six chapters, consisting of selected topics in food production and consumption and food preservation. All the six chapters have been written by renowned professionals working in Food Production and Industry and related disciplines.

This book covers the progress of the last 10 years of studies on cocoa butter. Descriptions of several aspects, including physical characteristics such as rheology, hardness, melt profiles, etc., studied by new and advanced techniques are included. Similarly, the polymorphism of cocoa butter is reconsidered in light of studies done by synchrotron DSC, FTIR, and SAXS techniques. These data are complemented by new understandings on the cause of the crystallization and transitions of the polymorphs. Other aspects such as the effect of minor components, emulsifiers, and other fats are discussed in great detail in this book. Brings together all that is known about cocoa butter into one book Describes physical characteristics of cocoa butter including rheology, hardness, and melt profiles Reconsiders polymorphism of cocoa butter in light of recent studies by various analytical techniques Presents new understandings on the cause of crystallization and transitions of polymorphs

Lipid science and technology has grown exponentially since the turn of the millennium. The replacement of unhealthy fats in the foods we eat, and of petroleum-based ingredients in the cosmetics we use, is a top priority for consumers, government, and industry alike. Particularly for the food industry, removing trans fats and reducing saturated fat

This book serves as a rich source of information on the production, processing, characterization and utilization of palm oil and its components. It also includes several topics related to oil palm genomics, tissue culture and genetic engineering of oil palm.

Physical, chemical and polymorphic properties of palm oil and its components as well as the measurement and maintenance of palm oil quality are included and may be of interest to researchers and food manufacturers. General uses of palm oil/kernel oil and their fractions in food, nutritional and oleochemical products are discussed as well as the potential use of palm oil as an alternative to trans fats. Some attention is also given to palm biomass, bioenergy, biofuels, waste management, and sustainability. Presents several chapters related to oil palm genetics, including oil palm genomics, tissue culture and genetic engineering. Includes contributions from more than 80 well-known scientists and researchers in the field. In addition to chapters on food uses of palm oil, the book contains nonfood applications such as use as a feedstock for wood-based products or for bioenergy. Covers key aspects important to the sustainable development of palm oil.

Whilst milk fat has always been appreciated for its flavour, the market had suffered from concerns over cardiovascular diseases associated with the consumption of animal fats. However, recent clinical studies have indicated benefits, particularly in relation to conjugated linoleic acids (CLA), in the prevention of certain diseases. The range of spreads has also increased, including the addition of probiotic organisms and/or plant extracts to reduce serum cholesterol levels. The primary aim of this publication is to detail the state-of-the-art manufacturing methods for: Cream Butter Yellow fat spreads, both pure milk fat based and mixtures with other fats Anhydrous milk fat and its derivatives Coverage of the manufacturing technologies is complemented by examinations of the relevant nutrition issues and analytical methods. The authors, who are all specialists in their fields in respect to these products, have been chosen from around the world. It is hoped that the book will provide a valuable reference work for dairy scientists and technologists within the dairy industry and those with similar processing requirements, as well as researchers and students, thus becoming an important component of the SDT's Technical Series. The Editor Dr Adnan Y. Tamime is a Consultant in Dairy Science and Technology, Ayr, UK. He is the Series Editor of the SDT's Technical Book Series. For information regarding the SDT, please contact Maurice Walton, Executive Director, Society of Dairy Technology, P.O. Box 12, Appleby in Westmorland CA16 6YJ, UK. email: execdirector@sdt.org Also available from Wiley-Blackwell Milk Processing and Quality Management Edited by A.Y. Tamime ISBN 978 1 4051 4530 5 Cleaning-in-Place Edited by A.Y. Tamime ISBN 978 1 4051 5503 8 Advanced Dairy Science and Technology Edited by T. Britz and R. Robinson ISBN 978 1 4051 3618 1 International Journal of Dairy Technology Published quarterly Print ISSN: 1364 727X Online ISSN: 1471 0307

The advances in lipid biochemistry over the past 25 to 30 years have been dramatic and exciting. The elucidation of the pathways of fatty acid biosynthesis and oxidation, the delineation of the biogenesis of cholesterol from small-molecular weight precursors, the structure proof of simple and complex lipids from plants, animals, and microorganisms, are excellent examples of the spectacular advances made during the golden era of lipid biochemistry. The multifaceted discoveries in these diverse areas of study could be attributed to development of highly sophisticated column chromatographic techniques for separation and purification of simple and complex lipids. The advent of thin-layer chromatography as well as gas liquid chromatography provided an explosive impetus to research developments in this field. Concomitant advances in mass spectrometry allowed an interface with gas-liquid chromatography which spawned even greater insight into the structure of lipids. These eventful days of lipid chemistry nearly 25 years ago led to a relatively quiescent period wherein scientists applied these newly available techniques to investigation of the behavior of isolated (lipid) enzyme systems and to unraveling the intricacies of the metabolic behavior of lipids in the intact cell or whole organisms. Then, in the early 1960s, a decided change in research emphasis developed with the advent of a simple, reproducible procedure for the isolation of cell membranes.

This text provides a comprehensive and thorough overview of kinetic modelling in food systems, which will allow researchers to further their knowledge on the chemistry and practical use of modelling techniques. The main emphasis is on performing kinetic analyses and creating models, employing a hands-on approach focused on putting the content discussed to direct use. The book lays out the requisite basic information and data surrounding kinetic modelling, presents examples of applications to different problems and provides exercises that can be solved utilizing the data provided. Kinetic Analysis of Food Systems pursues a practical approach to kinetic analysis, providing helpful exercises involving chlorophyll degradation in processed vegetables, metabolic oscillations and sugar accumulation in cold-stored potatoes, transesterification of oils to manufacture biodiesel, aggregation of whey proteins to make protein gels and crystallization of fat stabilizers used in nut butters, among others. The book lays out the basics of kinetic modelling and develops several new models for the study of these complex systems. Taken together with the accompanying exercises, they offer a full portrait of kinetic analysis, from its basic scientific groundwork to its application. The Handbook of Food Products Manufacturing is a definitive master reference, providing an overview of food manufacturing in general, and then covering the processing and manufacturing of more than 100 of the most common food products. With editors and contributors from 24 countries in North America, Europe, and Asia, this guide provides international expertise and a truly

global perspective on food manufacturing.

Advances in thermal and non-thermal food processing aims to discuss emerging trends based on the future scope and challenges and to explain uncertain challenges in food processing. In thermal processing different operations in food engineering namely advance drying methods, evaporation, extrusion cooking, different extraction techniques, crystallizations are covered in terms food engineering and process modeling aspect. For non-thermal processing, high pressure processing, ultrasound, ohmic heating, pulse electric field, pulse light technology, osmotic dehydration and so forth are discussed. Relevant mathematical modeling and numerical simulations has been included in every chapter. Features: Presents engineering focus on thermal and non-thermal food processing technologies. Discusses sub-classification for recent trends and relevant industry information/examples. Describes advances in drying, evaporation, blanching, crystallization and ohmic heating. Covers high-pressure processing, pulse electric field, pulse light technology, irradiation, and ultrasonic techniques. Includes mathematical modeling and numerical simulations. The book is aimed at graduate students, professionals in food engineering and food technology, biological systems engineering.

From the Author's Preface: There is a growing demand for ultrapure organic compounds such as fine chemicals, pharmaceuticals, and basic materials for use in the polymer industry. . . . In quite a number of cases, it is difficult or impossible to manufacture ultrapure organics efficiently using conventional separation techniques such as distillation. Moreover, conventional techniques usually require large amounts of energy. To improve the purification efficiency of organics, special techniques based on crystallization from the melt have been developed. Melt crystallization meets industry's need for a highly selective separation process for organic compounds which operates at low enough temperatures to prevent thermal degradation. Melt crystallization processes have the added advantage that they are energy-efficient and ecologically sound. Melt crystallization techniques appear to be particularly promising for upgrading organic materials and are one of the few routes that appear to be feasible for purifying starter materials for high-tech polymers. The aim of this book is to provide basic information on melt crystallization technology. . . . This monograph consists of three parts: 1. basic principles, 2. process options, and 3. technical equipment and applicability. This new book is the first unified guide and reference to an important chemical process technology. It is comprehensive and organized for easy reference. More than 150 diagrammatic representations, flow charts and photographs illustrate equipment and processes. More than 40 tables provide useful reference data.

Sonocrystallization of Fats will summarize the latest research efforts and discoveries in the relatively new area of sonocrystallization of edible lipids. Ultrasound has been used extensively in the past to induce the crystallization of molecules. Until recently, however, very little work has been done using power ultrasound to induce the crystallization of edible lipids and understand how the phenomena applies in these systems. Power ultrasound is used in fats to induce their crystallization and to generate small crystals, which ultimately result in a harder material. Since the elimination of trans-fats from food products, novel processing technologies have been sought to improve the functional properties of low saturated, no-trans lipids. Power ultrasound can be used as a new processing condition to modify the crystallization of fats and tailor their functional properties to specific food uses. This Springer Brief will describe recent research performed in the area of sonocrystallization of fats and the possible application in the food industry. An overview of ultrasound theories will be presented at the beginning of the book followed by a brief description of the uses of power ultrasound in the food industry. Description of recent research in the area of fat sonocrystallization and detailed information regarding the experimental conditions used, such as type of equipment and ultrasound settings, will be presented. The book will end with a description of the future trends in sonocrystallization of fats in the food industry. ? Crystallization is an important separation and purification process used in industries ranging from bulk commodity chemicals to specialty chemicals and pharmaceuticals. In recent years, a number of environmental applications have also come to rely on crystallization in waste treatment and recycling processes. The authors provide an introduction to the field of newcomers and a reference to those involved in the various aspects of industrial crystallization. It is a complete volume covering all aspects of industrial crystallization, including material related to both fundamentals and applications. This new edition presents detailed material on crystallization of biomolecules, precipitation, impurity-crystal interactions, solubility, and design. Provides an ideal introduction for industrial crystallization newcomers Serves as a worthwhile reference to anyone involved in the field Covers all aspects of industrial crystallization in a single, complete volume

Extensively revised, reorganized, and expanded, the third edition of the industry standard, The Lipid Handbook reflects many of the changes in lipid science and technology that have occurred in the last decade. All chapters have been rewritten, many by new authors, to match the updated thinking and practice of modern lipid science and bring a fresh perspective to twenty years of tradition. Retaining the general structure of the previous editions, The Lipid Handbook with CD-ROM, Third Edition collates a wide range of information into a single volume. New contributions highlight the latest technologies utilized in today's lipid science such as chromatographic analysis and nuclear magnetic resonance spectroscopy. An entirely new chapter is devoted to non-food uses such as lipids as surfactants, cosmetics, and biofuels. Expanded sections illustrate a growing emphasis on lipid metabolism and the nutritional, medical, and agricultural aspects including human dietary requirements and disorders of lipid metabolism. The dictionary section is vastly expanded to cover chemical structure, physical properties, and references to thousands of lipid and lipid related molecules. The handbook now includes a CD-ROM that allows instant access to tabulated and referenced information and can be searched either as the full text or by structure or substructure. Drawing from the best minds in the field, The Lipid Handbook with CD-ROM, Third Edition presents the latest technological developments and the current and future directions and applications of lipid science to the next generation of researchers.

This work highlights a new research area driven by a material science approach to dairy fats and dairy fat-rich products

where innovative dairy products and ingredients can be tailor-made. Cutting edge topics such as tribology of dairy fats and dairy products, manipulation of differentiated-sized milk fat globules, milk fat interesterification for infant formula, structuring of lipids in dairy products and production of human milk fat substitutes by including dairy fats are featured in dedicated chapters authored by international scientific experts from across the globe. The text also presents in-depth research on proteomic characterization, digestion and the nutritional functionality of milk fat globule membrane. The biosynthesis, chemistry, digestion and nutritional roles of milk lipids, physics of dairy fats, structure and functionality of the milk fat globule membrane, analytical methods, materials science, technology and manufacturing of dairy fat-rich products such as butter, dairy fat spreads, dairy creams, cream powders and ghee are also covered in-depth. Dairy Fat Products and Functionality: Fundamental Science and Technology is a useful reference text for technologists and scientists interested in advancing their fundamental knowledge of dairy fat and dairy products as well as using a materials science and technology approach to guide efforts or widen research opportunities in optimizing the functionality of these products. From their physics and chemistry to their nutritional values and methodologies, this comprehensive and innovative text covers all the necessary information needed to understand the new methods and technologies driving the modern production of milk fat products.

Structure of Dairy Products SOCIETY OF DAIRY TECHNOLOGY SERIES Edited by A. Y. Tamime The Society of Dairy Technology (SDT) has joined with Blackwell Publishing to produce a series of technical dairy-related handbooks providing an invaluable resource for all those involved in the dairy industry; from practitioners to technologists working in both traditional and modern large-scale dairy operations. The previous 30 years have witnessed great interest in the microstructure of dairy products, which has a vital bearing on, e.g. texture, sensory qualities, shelf life and packaging requirements of dairy foods. During the same period, new techniques have been developed to visualise clearly the properties of these products. Hence, scanning electron microscopy (SEM) and transmission electron microscopy (TEM) have been used as complimentary methods in quality appraisal of dairy products, and are used for product development and in trouble shooting wherever faults arise during manufacturing. Structure of Dairy Products, an excellent new addition to the increasingly well-known and respected SDT series, offers the reader: • information of importance in product development and quality control • internationally known contributing authors and book editor • thorough coverage of all major aspects of the subject • core, commercially useful knowledge for the dairy industry Edited by Adnan Tamime, with contributions from international authors, this book is an essential purchase for dairy scientists and technologists, food scientists and technologists, food chemists, physicists, rheologists and microscopists. Libraries in all universities and research establishments teaching and researching in these areas should have copies of this important work on their shelves.

Deals with the physical and chemical characteristics of fats and fatty acids, coordinating two approaches the microscopic analysis of polymorphic structures, and macroscopic technical control of production. Topics include fundamentals of crystallization and polymorphism, crystal structure, polymorph

Texture is one of the most important attributes used by consumers to assess food quality. This quality is particularly important for the growing number of semi-solid foods from sauces and dressings to yoghurt, spreads and ice cream. With its distinguished editor and international team of contributors, this authoritative book summarises the wealth of recent research on what influences texture in semi-solid foods and how it can be controlled to maximise product quality. Part one reviews research on the structure of semi-solid foods and its influence on texture, covering emulsion rheology, the behaviour of biopolymers and developments in measurement. Part two considers key aspects of product development and enhancement. It includes chapters on engineering emulsions and gels, and the use of emulsifiers and hydrocolloids. The final part of the book discusses improving the texture of particular products, with chapters on yoghurt, spreads, ice cream, sauces and dressings. With its summary of key research trends and their practical implications in improving product quality, Texture in food Volume 1: semi-solid foods is a standard reference for the food industry. It is complemented by a second volume on the texture of solid foods. Summarises the wealth of recent research on what influences texture in semi-solid foods and how it can be controlled to maximise product quality Reviews research on the structure of semi-solid foods and its influence on texture, covering emulsion rheology, the behaviour of biopolymers and developments in measurement Considers key aspects of product development and enhancement and includes chapters on engineering emulsions and gels and the use of emulsifiers and hydrocolloids

This second edition provides information on recent advances in the science and technology of chocolate manufacture and the entire international cocoa industry. It provides detailed review on a wide range of topics including cocoa production, cocoa and chocolate manufacturing operations, sensory perception of chocolate quality, flavour release and perception, sugar replacement and alternative sweetening solutions in chocolate production, industrial manufacture of sugar-free chocolates as well as the nutrition and health benefits of cocoa and chocolate consumption. The topics cover modern cocoa cultivation and production practices with special attention on cocoa bean composition, genotypic variations in the bean, post-harvest pre-treatments, fermentation and drying processes, and the biochemical basis of these operations. The scientific principles behind industrial chocolate manufacture are outlined with detailed explanations of the various stages of chocolate manufacturing including mixing, refining, conching and tempering. Other topics covered include the chemistry of flavour formation and development during cocoa processing and chocolate manufacture; volatile flavour compounds and their characteristics and identification; sensory descriptions and character; and flavour release and perception in chocolate. The nutritional and health benefits of cocoa and chocolate consumption as well as the application of HACCP and other food safety management systems such as ISO 22,000 in the chocolate processing industry are also addressed. Additionally, detailed research on the influence of different raw materials and processing operations on the flavour and other quality characteristics of chocolates have been provided with scope for process optimization and improvement. The book is intended to be a desk reference for all those engaged in the business of making and using chocolate worldwide; confectionery and chocolate scientists in industry and academia; students and practising food scientists and technologists; nutritionists and other health professionals; and libraries of institutions where agriculture, food science and nutrition is studied and researched.

Structure-Function Analysis of Edible Fats, Second Edition summarizes the latest approaches in the quantification of the physical structure of fats and its relationship to macroscopic functionality. The book takes a proven, general approach, presenting principles and techniques in a way that can be applied to any lipidic material. As the maturity of the field has increased since the first edition, there is an increased need for more sophisticated quantitative approaches to common problems encountered by industry. This book outlines modern methods used for this purpose by some of the leading authorities in the field today. Edited by expert Alejandro Marangoni, and with contributions from leaders in field, the book features the latest developments, including chapters on Phase Behavior of Fat Mixtures and the Rheology and Mechanical Properties of Fats Methods Used in the Study of the Physical Properties of Fats (including a new section on microscopy). Fully revised and updated with 30% new content, including new chapters on Phase Behavior of Fat Mixtures, Rheology and Mechanical Properties of Fats, and Methods Used in the Study of the Physical Properties of Fats Includes a new section on microscopy Presents the principles behind X-ray diffraction, crystallization theory, and the mechanics of fats Provides theory for foundational understanding, examples for real-world insight, and tips for improving applied results

Annotation The crystallization and solidification properties of lipids influence their functional properties in biological systems, foods, personal care products, pharmaceuticals, and oleo chemicals. To help its members and others optimize products or systems containing lipids, the American Oil Chemists Society devoted its 2000 conference, held in Toronto, to the fundamental principles of lipid crystallization. The resulting 20 papers discuss phase behavior and polymorphism, lipid crystallization kinetics, microstructure and rheology, and crystallization in emulsions. They also consider applications to dairy systems, manufacturing chocolate confection, and the texture of fats. Annotation c. Book News, Inc., Portland, OR (booknews.com).

In general, metallic alloys are the interdisciplinary subject or even an area that cover physics, chemistry, material science, metallurgy, crystallography, etc. This book is devoted to the metallic alloys. The primary goal is to provide coverage of advanced topics and trends of R

This book acknowledges the importance of fats and oils and surveys today's state-of-the-art technology. To pursue food technology without knowing the raw material would mean working in a vacuum. This book describes the raw materials predominantly employed and the spectrum of processes used today. It is the updated and revised English version of Nahrungsfette und Ole, originally printed in German. It contains 283 tables, 647+ figures, and over 850 references. "If you can afford only one book on oils and fats, their composition, processing and use, then this should probably be the one!" Presents details on the composition, chemistry, and processes of the major fats and oils used today Includes hundreds of illustrations and tables, making the concepts easier to read and grasp Acknowledges the importance of fats and oils offers details on relevant technologies

The aim of this book is to provide a timely collection that highlights advances in current research of crystal growth ranging from fundamental aspects to current applications involving a wide range of materials. This book is published on the basis of lecture texts of the 11th International Summer School on Crystal Growth (ISSCG-11) to be held at Doshisha Retreat Center in Shiga Prefecture Japan, on July 24-29, 2001. This school is always associated with the International Conference of Crystal Growth (ICCG) series that have been held every three years since 1973; thus this school continues the tradition of the past 10 schools of crystal growth.

Fats are present in some form in the vast majority of processed foods we consume, as well as in many 'natural' products. Changes in consumer behaviour, centered around an increased emphasis on healthy food consumption, mean that it is more important than ever for food scientists to understand the properties, roles and behaviours that fats play in food and in diets. Fats in Food Technology, Second Edition is an in-depth examination of the roles and behaviours of fats in food technology and the benefits that they impart to consumers. It considers both fats that are naturally present in foods (such as milk fat in cheese) and fats that have been added to improve physical, chemical and organoleptic properties (like cocoa butter in chocolate). Newly revised and updated, the book contains useful information on the market issues that have driven change and the disciplines that have helped to regulate the trade and use of fats and oils in food technology. Drawing on the recent literature as well as the personal R&D experiences of the authors, the book highlights those areas where potential efficiencies in processing and economy in the cost of raw materials can be made. Issues concerning health, diet and lifestyle are covered in dedicated chapters. This book will be useful to anyone in industry and research establishments who has an interest in the technology of fat-containing food products, including scientists in the dairy, spreads, bakery, confectionery and wider food industries, as well those involved in the production of edible oils.

In the interest of consumer health, many fats and oils processors continuously strive to develop healthier preparation procedures. Following in the footsteps of its previous bestselling editions, Fats and Oils: Formulating and Processing for Applications, Third Edition delineates up-to-date processing procedures and formulation techniques as well a Crystallization Processes in Fats and Lipid SystemsCRC Press

An authoritative reference that contains the most up-to-date information knowledge, approaches, and applications of lipid crystals Crystallization of Lipids is a comprehensive resource that offers the most current and emerging knowledge, techniques and applications of lipid crystals. With contributions from noted experts in the field, the text covers the basic research of polymorphic structures, molecular interactions, nucleation and crystal growth and crystal network formation of lipid crystals which comprise main functional materials employed in food, cosmetic and pharmaceutical industry. The authors highlight trans-fat alternative and saturated-fat reduction technology to lipid crystallization. These two issues are the most significant challenges in the edible-application technology of lipids, and a key solution is lipid crystallization. The text focuses on the crystallization processes of lipids under various external influences of thermal fluctuation, ultrasound irradiation, shear, emulsification and additives. Designed to be practical, the book's information can be applied to realistic applications of lipids to foods, cosmetic and pharmaceuticals. This authoritative and up-to-date guide: Highlights cutting-edge research tools designed to help analyse lipid crystallization with the most current and the conventional techniques Offers a thorough review of the information, techniques and applications of lipid crystals Includes contributions from noted experts in the field of lipid crystals Presents cutting-edge information on the topics of trans-fat alterative and saturated-fat reduction technology Written for research and development technologists as well as

academics, this important resource contains research on lipid crystals which comprise the main functional materials employed in food, cosmetic and pharmaceutical industry.

This book provides an in-depth study of the changes which occur in the components of food when they are subjected to processing. The book is divided into two distinct parts. In the first part the fundamental changes are examined from a scientific point of view. These include: Vapor pressure and water activity; Glass transition; Emulsion technology; Maillard (Browning) reaction; Rheology; Foams; Gels and gelling; Fat eutectics and crystallization; Surface effects; Fermentation; Change in cell structure. In the second part of the book these changes are reviewed as to how they are important to different parts of the food industry. Chapters included concern: Dairy products; Cakes, baking, and bread making; Meat and fish; Fruits and vegetables; Preserves and jellies; Sugar and confectionery; Chocolate; Extruded products; Sauces, pickles, and condiments; Alcoholic drinks; and Multicomponent products.

This volume contains studies on the molecular organisation on interfaces and nanoparticles. The contributions were presented during the 40. General Meeting (Hauptversammlung) of the Kolloid-Gesellschaft in Potsdam in September 2001 and are related to the subject "Colloids and Life Science". Therefore, a diversity of papers were collected covering a large field: synthesis of polymer colloids, biominerals and nanoparticles, investigations on monolayers, lyotropic mesophases, polymeric surfactants, micellar transitions, supramolecular compounds for modifying polymers, solid particles for emulsion stabilisers, and adsorbents for odour control.

The first authoritative source on the subject, this reference discusses the various levels of structure that influence the macroscopic physical properties of fat crystal networks. Fat Crystal Networks summarizes 50 years of structural research in the field, as well as a wealth of information on fat crystal networks pertinent to real-world challenge

An exploration of new and emerging techniques, processes and applications in the behaviour, crystallization, and polymorphic transformations of fats and oils. It presents research and information on advanced analytical tools, computer modelling, molecular structures, mixing behaviour, and interactions with seeding materials and surfactants. The con In nearly all process industries, crystallization is used at some stage as a method of production, purification or recovery of solid materials. In recent years, a number of new applications have also come to rely on crystallization processes such as the crystallization of nano and amorphous materials. The articles in this book have been contributed by some of the most respected researchers in this area and cover the frontier areas of research and developments in crystallization processes. Divided into three sections, this book provides the latest research developments in many aspects of crystallization including the crystallization of biological macromolecules and pharmaceutical compounds, the crystallization of nanomaterials and the crystallization of amorphous and glassy materials. This book is of interest to both fundamental research and practicing scientists and will prove invaluable to all chemical engineers and industrial chemists in process industries, as well as crystallization workers and students in industry and academia.

In the food industry, controlling crystallization is a key factor in quality as it relates to texture, with some foods requiring the promotion of crystallization and others its prevention. In the first publication to focus specifically on this process as it applies to food, Crystallization in Foods covers fundamental principles in ice, sugar, and lipid crystallization, and their applications. Drawing on examples throughout of the practical use and impact of crystallization on food structure, texture, and quality; and enhanced with numerous equations and illustrations, Crystallization in Foods is a valuable resource for food engineers and other scientists working with crystallization in foods, particularly in the dairy, confectionery, frozen foods, and baked goods industries. In addition, this book may be of interest to scientists and other professionals in the personal care and cosmetics industry, which shares some of the same quality and texture concerns as the food industry. Crystal growth technology involves processes for the production of crystals essential for microelectronics, communication technologies, lasers and energy producing and energy saving technology. A deliberately added impurity is called an additive and in different industries these affect the process of crystal growth. Thus, understanding of interactions between additives and the crystallizing phases is important in different processes found in the lab, nature and in various industries. This book presents a generalized description of the mechanisms of action of additives during nucleation, growth and aggregation of crystals during crystallization and has received endorsement from the President of the International Organization for Crystal Growth. It is the first text devoted to the role of additives in different crystallization processes encountered in the lab, nature and in industries as diverse as pharmaceuticals, food and biofuels. A unique highlight of the book are chapters on the effect of additives on crystal growth processes, since the phenomena discussed is an issue of debate between researchers

This book resulted from many years of teaching engineering aspects of food technology at the Agricultural University of Wageningen, The Netherlands. In the course of those years the subject matter of teaching has been written down and placed at the student's disposal. The Dutch text has been reconsidered and revised several times. Eventually the question arose whether it would be advisable to transform and translate the text in order to transfer available knowledge and experience to others interested in the relatively new branch of food science that food process engineering is. This question has been answered in the affirmative. Up to now only a few books deal with food process engineering; some are rather superficial and evidently meant as introductory, other ones have in our opinion too much emphasis on chemical engineering and too little on food process engineering. We believe - and this will be elucidated at some length in the Introduction - that food process engineering is in many respects a very specific branch of engineering, allied to but certainly different from chemical engineering. We have always endeavored to show similarities between various branches, stressing at the same time however the differences and explaining the why and wherefore of them. The present book illustrates this approach. It considers engineering, process engineering and food process engineering as ranking in this order of rising importance.

Oils and fats are almost ubiquitous in food processing, whether naturally occurring in foods or added as ingredients that

bring functional benefits. Whilst levels of fat intake must be controlled in order to avoid obesity and other health problems, it remains the fact that fats (along with proteins and carbohydrates) are one of the three macronutrients and therefore an essential part of a healthy diet. The ability to process oils and fats to make them acceptable as part of our food supplies is a key component in our overall knowledge of them. Without this ability, the food that we consume would be totally different, and much of the flexibility available to us as a result of the application of processing techniques would be lost. Obviously we need to know how to process fatty oils, but we also need to know how best to use them once they have been processed. This second edition of Edible Oil Processing presents a valuable overview of the technology and applications behind the subject. It covers the latest technologies which address new environmental and nutritional requirements as well as the current state of world edible oil markets. This book is intended for food scientists and technologists who use oils and fats in food formulations, as well as chemists and technologists working in edible oils and fats processing.

Trans fatty acids (TFAs) have been used for many years to impart desirable physical characteristics to fats and fat blends used in food manufacturing. However, clinical trials and epidemiological studies conducted over the last thirty years have shown that TFAs can increase “bad” cholesterol levels in the blood while reducing “good” cholesterol. Accordingly, they are also linked with increased risks of coronary heart disease, thrombosis and strokes. For this reason, the food industry has been obliged to find alternatives to TFAs, thus enabling it to meet the presumed consumer demand for “low” or “no” trans fats products. The issue is becoming more and more pressing. For example, US labelling regulations now require that food manufacturers state the trans fat content of their products on the packaging. This book provides an overview of trans fatty acids in oils and fats used in food manufacture. Topics covered include: the chemistry and occurrence of TFAs; analytical methods for determining the fatty acid composition including TFAs of foods; processing techniques for reducing, minimising or even avoiding the formation of TFAs; TFA alternatives in food; health and nutrition concerns and legislative aspects. It is directed at chemists and technologists working in edible oils and fats processing and product development; food scientists and technologists; analytical chemists and nutritionists working in the food industry.

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