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Food Industry, Volume 8, provides the latest information on the increasing demand for robust, rapid, inexpensive, and safe alternative technologies that monitor, test, and detect harmful or potentially dangerous foods. Due to their high sensitivity and selectivity, nanobiosensors have attracted attention for their use in monitoring not only biological contaminants in food, but also potential chemical and physical hazards. This book offers a broad overview regarding the current progress made in the field of nanosensors, including cutting-edge technological progress and the impact of these devices on the food industry. Special attention is given to the detection of microbial contaminants and harmful metabolotes, such as toxins and hormones, which have a great impact on both humans and animal health and feed. Includes the most up-to-date information on nanoparticles based biosensors and quantum dots for biological detection Provides application methods and techniques for research analysis for bacteriological detection and food testing Presents studies using analytical tools to improve food safety and quality analysis

Nanoscience and Nanotechnology in Foods and Beverages
National Academies Press
A comprehensive overview of the current state of this highly relevant topic. An interdisciplinary team of researchers reports on the opportunities and challenges of nanotechnology in the agriculture and food sector, highlighting the scientific, technical, regulatory, safety, and societal impacts. They also discuss the perspectives for the future, and provide insights into ways of assuring safety so as to obtain confidence for the consumer, as well as an overview of the innovations and applications. Essential reading for materials and agricultural scientists, food chemists and technologists, as well as toxicologists and ecotoxicologists.

Nanoscience in Food and Agriculture 4
CRC Press
This book presents a comprehensive overview of new and emerging nanotechnologies. It includes aspects of nanoparticle monitoring, toxicity, and public perception, and covers applications that address both crop growing and treatment of agricultural wastewater. Topics include nanoagroche

micals (nanofertilizers, -pesticides, -herbicides), nanobiosensors, and nanotechnologies for food processing, packaging, and storage, crop improvement and plant disease control. The group of expert authors is led by an experienced team of editors.

Nano-enabled Agrochemicals in Agriculture

Springer Nature

Nothing provided

Pan Stanford Publishing

Nanotechnology in Sustainable Agriculture presents applications of nanobiotechnology for eco-friendly agriculture practices. Implementing sustainable agriculture techniques is a crucial component in meeting projected global food demands while minimising toxic waste in the environment. Nano-technological tools – including nanoparticles, nanocapsules, nanotubes and nanomolecules – offer sustainable options to modernise agriculture systems. Written by nanotechnology experts, this book outlines how nano-formulations can improve yield without reliance on chemecial pesticides and reduce nutrient losses in fertilization. It reveals how nanotools are used for rapid disease diagnostics, in treating plant diseases and enhancing the capacity for

plants to absorb nutrients. Features: Combines nanotechnology and agronomy presenting applications for improving plant performance and yields. Reveals nanotechnology-based products used for the soil and plant health management which mitigate climate change. Discusses roles of microbial endophytes, heavy metal nanoparticles and environment health, nano-nutrients, phytochemicals, green bioengineering and plant health. This book appeals to professionals working in the agriculture and food industry, as well as agricultural scientists and researchers in nanotechnology and agronomy.

An Agricultural Paradigm

Frontiers Media SA

This book is the third volume on Nanoscience in Food and Agriculture, published in the Sustainable Agriculture Reviews series. In this book we present ten chapters describing the synthesis and application of nanomaterials for health, food, agriculture and bioremediation.Nanomaterials with unique properties are now being used to improve food and agricultural production. Research on nanomaterials is indeed

revealing new applications that were once thought to be imaginary. Specifically, applications lead to higher crop productivity with nanofertilisers, better packaging, longer food shelf life and better sensing of aromas and contaminants. These applications are needed in particular in poor countries where food is scarce and the water quality bad. Nanotechnology also addresses the age old issue of water polluted by industrial, urban and agricultural pollutants. For instance, research produces nanomaterials that clean water more efficiently than classical methods, thus yielding water for drinking and irrigation. However, some nano materials have been found to be toxic. Therefore, nanomaterials should be engineered to be safe for the environment.

Recent Advances and Impacts

Springer

A comprehensive overview of the current state of this highly relevant topic. An interdisciplinary team of researchers reports on the opportunities and challenges of nanotechnology in the agriculture and food sector, highlighting the scientific, technical, regulatory, safety, and societal impacts. They also discuss the

perspectives for the future, and provide insights into ways of assuring safety so as to obtain confidence for the consumer, as well as an overview of the innovations and applications. Essential reading for materials and agricultural scientists, food chemists and technologists, as well as toxicologists and ecotoxicologists.

Environment, Energy, Agriculture and Medicine

Elsevier

Explores the enormous diversity in social perspectives on the emergence of nanotechnologies under five broad categories: Philosophy, governance, science, representations and arts, and attention is drawn to important research lines and pertinent questions within and across these categories. To stimulate a thorough discussion the book includes pieces of science fiction and visual arts, as well as questions for reflection after each chapter.

Nanotechnology for Agriculture: Crop Production & Protection

CRC Press

Nanotechnology is increasingly used in the food industry in the production, processing, packaging, and preservation of foods. It is also used to enhance flavor and color, nutrient delivery, and bioavailability,

and to improve food safety and in quality management. Nanotechnology Applications in the Food Industry is a comprehensive reference book containing exhaustive information on nanotechnology and the scope of its applications in the food industry. The book has five sections delving on all aspects of nanotechnology and its key role in food industry in the present scenario. Part I on Introduction to Nanotechnology in Food Sector covers the technological basis for its application in food industry and in agriculture. The use of nanosized foods and nanomaterials in food, the safety issues pertaining to its applications in foods and on market analysis and consumer perception of food nanotechnology has been discussed in the section. Part II on Nanotechnology in Food Packaging reviews the use of nanopolymers, nanocomposites and nanostructured coatings in food packaging. Part III on Nanosensors for Safe and Quality Foods provides an overview on nanotechnology in the development of biosensors for pathogen and food contaminant detections, and in sampling and food quality management. Part IV on Nanotechnolo

gy for Nutrient Delivery in Foods deals with the use of nanotechnology in foods for controlled and effective release of nutrients. Part V on Safety Assessment for Use of Nanomaterials in Food and Food Production deliberates on the benefits and risks associated with the extensive and long term applications of nanotechnology in food sector. **Implications for the Future** IGI Global Nanotechnology Applications in Food: Flavor, Stability, Nutrition, and Safety is an up-to-date, practical, applications-based reference that discusses the advantages and disadvantages of each application to help researchers, scientists, and bioengineers know what and what not to do to improve and facilitate the production of food ingredients and monitor food safety. The book offers a broad spectrum of topics trending in the food industry, such as pharmaceutical, biomedical, and antimicrobial approaches in food, highlighting current concerns regarding safety, regulations, and the restricted use of nanomaterials. Includes how nanobiosensors are useful for the detection of foodborne pathogens Discusses

applications of nanotechnology from flavor and nutrition, to stability and safety in packaging Includes nano and microencapsulation, nanoemulsions, nanosensors, and nano delivery systems Identifies practical applications of nanoscience for use in industry today Nanotechnology Applications in the Food Industry Springer This book presents comprehensive reviews on the principles, design and applications of nanomaterials in the food and agriculture sectors. This book is the fifth of several volumes on Nanoscience in Food and Agriculture, published in the series Sustainable Agriculture Reviews. Nanotechnology and Nanomaterial Applications in Food, Health, and Biomedical Sciences John Wiley & Sons In the food industry, scientists are exploring the potential of nanotechnology to enhance the flavor and other sensory characteristics of foods, introduce antibacterial nanostructures into food packaging and encapsulate and deliver nutrients directly into targeted tissues, among other applications. However, as with any new technology, along with the benefits, there is the potential for unanticipated adverse effects. There is still a great

deal to learn about any health outcomes related to introducing nanosized materials into foods and food packaging materials. Developing nanotechnology into a safe, effective tool for use in food science and technology will require addressing these and other questions. Assuring consumer confidence will be equally important to the success of this new emerging technology. The Institute of Medicine held a one-day workshop, summarized in this volume, to further explore the use of nanotechnology in food. Specifically, the workshop was organized around three primary topic areas: (1) the application of nanotechnology to food products; (2) the safety and efficacy of nanomaterials in food products; and (3) educating and informing consumers about the applications of nanotechnology to food products.

Applications of Nanomaterials in Agriculture, Food Science, and Medicine

Academic Press

Providing an overview of nanotechnology in the context of agriculture and food science, this monograph covers topics such as nano-applications in teh agri-food sector, as well as the social and ethical implications. Following a review of the

basics, the book goes on to take an in-depth look at processing and engineering, encapsulation and delivery, packaging, crop protection and disease. It highlights the technical, regulatory, and safety aspects of nanotechnology in food science and agriculture, while also considering the environmental impact. A valuable and accessible guide for professionals, novices, and students alike.

Multifunctional Hybrid Nanomaterials for Sustainable Agri-food and Ecosystems

Springer

This book provides up to date information on the emerging trends and technology in food nanotechnology. It gives high-quality literature focused on the recent developments, research trends, methods and issues related to the safe use of nanoscale materials to add value to food. Most importantly, this book encloses critical reviews on micro and nanoengineering concepts, principles and applications in food. It also provides a scientific basis of micro and nanoengineered structures and compounds, their industrial food applications, encapsulation techniques and methods. This book encompasses detection, analysis and characterization techniques

for nanostructures, the fate of encapsulated materials in target food. It also educates on regulatory issues and safety of clinical translation of nanomaterials in fortified foods.

FAO/WHO Expert Meeting on the Application of Nanotechnologies in the Food and Agriculture Sectors

Springer Nanotechnology is a fast-evolving discipline that already produces outstanding basic knowledge and industrial applications for the benefit of society. It is a new emerging and fascinating field of science, that permits advanced research in many areas. The first applications of nanotechnology mainly concerned material sciences; applications in the agriculture and food sectors are still emerging. Food science nanotechnology is an area of rising attention that unties new possibilities for the food industry. Due to the rapid population growth there is a need to produce food and beverages in a more efficient, safe and sustainable way. The application of nanotechnology in food has also gained great importance in recent years in view of its potential application to improve production of food crops, enhance nutrition,

packaging and food safety overall. The new materials, products and applications are anticipated to bring lots of improvements to the food and related sectors, impacting agriculture and food production, food processing, distribution, storage, sanitation as well as the development of innovative products and sensors for effective detection of contaminants. Therefore, nanotechnology present with a large potential to provide an opportunity for the researchers of food science, food microbiology and other fields, to develop new tools for incorporation of nanoparticles into food system that could augment existing functions and add new ones. However, the number of relative publications currently available is rather small. The present Research Topic aims to provide with basic information and practical applications regarding all aspects related to the applications of nanotechnology in food science and food microbiology, namely, nanoparticle synthesis, especially through the eco-friendly perspective, potential applications in food processing, biosensor development, alternative strategies for effective

pathogenic bacteria monitoring as well as the possible effects on human health and the environment.

Novel Approaches of Nanotechnology in Food

Academic Press

The uses of nanotechnologies continue to rise exponentially. Due to their multifaceted nature, nanomaterials have a vast amount of potential uses in various scientific professions. Professionals in sectors including agriculture, nutrition, and healthcare are discovering the numerous benefits that nanomaterials carry when applied to traditional practices. In order to understand the dynamic properties of nanomaterials and how to utilize them in specific fields, significant research is required. Applications of Nanomaterials in Agriculture, Food Science, and Medicine is an essential reference source that discusses the emerging development of nanotechnology in various sectors of the scientific community as well as the current benefits and future uses. Industries that the book covers include energy storage and renewable energy, environmental science and wastewater treatment, food and agriculture, and medicine and bioinformatics. This book is ideally designed for

researchers, engineers, practitioners, industrialists, educators, strategists, policymakers, scientists, and students seeking coverage on the strategic role of nanomaterials in these imperative fields.

Nanoscience in Food and Agriculture 1 John Wiley & Sons

" ... FAO headquarters on 1-5 June 2009 ..."--P. xvii.

Impact of Nanoscience in the Food Industry World Health Organization

Nanotechnology has grown in its use and adoption across sectors. In particular, the medical field has identified the vast opportunities nanotechnology presents, especially for earlier disease detection and diagnosis versus traditional methods. Integrating Biologically-Inspired Nanotechnology into Medical Practice presents the latest research on nanobiotechnology and its application as a real-world healthcare solution. Emphasizing applications of micro-scale technologies in the areas of oncology, food science, and pharmacology, this reference publication is an essential resource for medical professionals, researchers, chemists, and graduate-level students in the medical and pharmaceutical sciences.

Bio-Nanotechnology CRC Press

Bio-

nanotechnology is the key functional technology of the 21stcentury. It is a fusion of biology and nanotechnology based on theprinciples and chemical pathways of living organisms, and refers tothe functional applications of biomolecules in nanotechnology. Itencompasses the study, creation, and illumination of theconnections between structural molecular biology, nutrition andnanotechnology, since the development of techniques ofnanotechnology might be guided by studying the structure andfunction of the natural nano-molecules found in living cells.Biology offers a window into the most sophisticated collection offunctional nanostructures that exists. This book is a comprehensive review of the state of the art inbio-nanotechnology with an emphasis on the diverse applications infood and nutrition sciences, biomedicine, agriculture and otherfields. It describes in detail the currently available methods andcontains numerous references to the primary literature, making thisthe perfect “field guide” for scientists who want toexplore the fascinating world of bio-nanotechnology. Safety issuesregarding these new

technologies are examined in detail. The book is divided into nine sections – an introductoryse ction, plus: Nanotechnolo gy in nutrition and medicine Nanotechnolo gy, health and food technology applications Nanotechnolo gy and other versatile applications Nanomaterial manufacturing Applications of microscopy and magnetic resonance innanotechnol ogy Applications in enhancing bioavailability and controllingpat hogens Safety, toxicology and regulatory aspects Future directions of bio-nanotechnolo gy The book will be of interest to a diverse range of readers inindustry, research and academia, including biologists, biochemists,fo od scientists, nutritionists and health professionals.

Application of Nanotechnol ogy in Food Science and Food Microbiology

Academic Press

The emergence of nanotechnolo gy and the development of new nanodevices and nanomaterials have opened up exciting opportunities for novel applications in agriculture and biotechnology. Nanotechnolo gy has the potential to modernize agricultural research and practice, but although it has gained momentum in the agriculture sector over last decade,

there are still knowledge gaps between scientific communities. This book presents a comprehensive overview of current developments in nanotechnology-based sustainable agriculture. Focusing on various aspects of nanotechnology in different sectors of agriculture, such as crop production, soil fertility management and crop improvement, it offers insights into the current trends and future prospects of nanotechnology, along with the benefits and risks and their impact on agricultural ecosystems. It also highlights the use of nanotechnology to reduce agrochemical usage, to increase nutrient uptake efficiency and to improve water and nutrient management, and the use of nano-biosensors to manage plant diseases. The book is a valuable reference resource for scientists, policymakers, students and researchers who are engaged in developing strategies to cope with current agricultural challenges.

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