Mycotoxins In Food Detection And Control

A reference for microbiologists wanting to know which media to use for the detection of various microbes in foods and how to check their performance.

Food Contaminants and Residue Analysis treats different aspects of the analysis of contaminants and residues in food and highlights some current concerns facing this field. The content is initiated by an overview on food safety, the objectives and importance of determining contaminants and residues in food, and the problems and challenges associated to these analyses. This is followed by full details of relevant EU and USA regulations. Topics, such as conventional chromatographic methods, accommodating cleanup, and preparing substances for further instrumental analysis, are encompassed with new analytical techniques that have been developed, significantly, over the past few years, like solid phase microextraction, liquid chromatography-mass spectrometry, immunoassays, and biosensors. A wide range of toxic contaminants and residues, from pesticides to mycotoxins or dioxins are examined, including polychlorinated biphenyls, polycyclic aromatic hydrocarbons, N-nitrosamines, heterocyclic amines, acrylamide, semicarbazide, phthalates and food packing migrating substances. This book can be a practical resource that offers ideas on how to choose the most effective techniques for determining these compounds as well as on how to solve problems or to provide relevant information. Logically structured and with numerous examples, Food Contaminants and Residue Analysis will be valuable a reference and training guide for postgraduate students, as well as a practical tool for a wide range of experts: biologists, biochemists, microbiologists, food chemists, toxicologists, chemists, agronomists, hygienists, and everybody who needs to use the analytical techniques for evaluating food safety.

Mycotoxins are substances produced from fungal secondary metabolic processes. They impair animal health, thereby causing great economic losses of livestock through disease. Livestock come into contact with mycotoxins through contaminated feedstuff. Feedstuff is any of the constituent nutrients of an animal ration. The plants used in feed, such as grains, oil seeds, nuts, and root crops, are susceptible to mycotoxin contamination. Mycotoxins in Feedstuffs lists (in the style of a dictionary) feeds which have been reported to have been contaminated with mycotoxins, including data on the degree of contamination, the concentration of the toxins, and the country of origin and/or detection of the contaminated feed. This second edition will feature: - More than 180 new publications concerning mycotoxins in feedstuffs. - A more efficient organization of the content, making the book easier to use in daily practice. - A single-chapter overview of mycotoxins in the corresponding feedstuffs.

Mycotoxins are increasingly attracting attention at the governmental, public and academic level worldwide, due to more frequent and serious contaminations of food and feedstuffs, which pose a serious threat to human health and animal production. This book reviews the latest research on mycotoxins that directly concern food safety, and especially focuses on detection technologies, risk assessment and control strategies currently being used in China. Gathering contributions from over 20 respected researchers, the book will benefit graduate students, researchers and management groups from various disciplines, including food science and technology, analytical chemistry, plant pathology, public health, etc.
The first book to cover this fast developing field, Masked Mycotoxins in Food will provide a full overview of the issues relating to the toxicology of masked mycotoxins present in food products. Mycotoxins are naturally occurring chemicals produced by moulds that can grow on crops and foodstuffs. Masked mycotoxins are modified mycotoxins, due to this modification many cannot be detected using standard analytical techniques, for example HPLC and ELISA, and further research is needed to understand the health risks and threats from these modified compounds. Masked mycotoxin research is an area of toxicological research that has gained significant interest and momentum in recent years. The aim of this book is to provide a full picture of the topic, from the masked mycotoxin formation in plants to their catabolic fate in humans. The book also provides new insights and will highlight possible gaps in the knowledge base of this relatively new area. Edited and written by World renowned experts working within the field, this book is of interest to toxicologists and biochemists, but also food scientists and agricultural researchers working in industry and academia. Aflatoxins are responsible for damaging up to 25% of the world’s food crops, resulting in large economic losses in developed countries and human and animal disease in under-developed ones. In addition to aflatoxins, the presence of other mycotoxins, particularly fumonisins, brings additional concerns about the safety of food and field supplies. The book is based on EU-funded project PLANTFOODSEC, covering intentional and unintentional threats to plant biosecurity and to food safety areas. Biosecurity is a strategic and integrated approach for analysing and managing relevant risks to human, animal and plant life and health, and associated risks to the environment. Interest in biosecurity has risen considerably over the last decade in parallel with the increasing trade in food and plant and animal products; higher levels of international travel; new outbreaks of transboundary diseases. Although most diseases outbreaks have natural causes or are the result of inadvertent introductions of pathogens through human activities, the risk of a deliberate introduction of a high consequence plant pathogen cannot be excluded. Vigilance is required to identify, prevent and manage new and emerging issues that could impact on production capacity, plant biosecurity or food safety and food chain resilience.

An indispensable reference, this book provides an overview of the main mycotoxins in food. It is the first complete reference dedicated to toxin producing fungi in foodstuff. The book lists the degree of contamination, concentration of the toxins, and the country of origin and/or detection for each case of contamination presented in the book. Moreover, the book discusses whether a foodstuff is predisposed for mycotoxin contamination. It is written for professionals in the food industry, agriculture, control agencies, food processing, food chemistry, microbiology, and mycology.

Microbial Contamination and Food Degradation, Volume 10 in the Handbook of Food Bioengineering series, provides an understanding of the most common microbial agents involved in food contamination and spoilage, and highlights the main detection techniques to help pinpoint the cause of contamination. Microorganisms may cause health-threatening conditions directly by being ingested together with contaminated food, or indirectly by producing harmful toxins and factors that can cause food borne illness. This resource discusses the potential sources of contamination, the latest advances in contamination research and strategies to prevent contamination using key...
methods of analysis and evaluation. Presents modern alternatives for avoiding microbial spoilage and food degradation using preventative and intervention technologies. Provides key methods for addressing microbial contamination and preventing foodborne illness through research and risk assessment analysis. Includes detailed information on bacterial contamination problems in different environmental environments and the methodologies to help solve those problems.

Smartphone usage has created a new means for detection, analysis, diagnosis and monitoring through the use of new apps and attachments. These breakthrough analytical methods offer ways to overcome the drawbacks of more conventional methods, such as the expensive instrumentation that is often needed, complex sample pre-treatment steps, or time-consuming procedures. Smartphone-Based Detection Devices: Emerging Trends in Analytical Techniques gathers these modern developments in smartphone analytical methods into one comprehensive source, covering recent advancements in analytical tools while paying special attention to the most accurate, highly efficient approaches. Serving as a guide not only to analytical chemists but also to environmentalists, biotechnologists, pharmacists, forensic scientists and toxicologists, Smartphone-Based Detection Devices: Emerging Trends in Analytical Techniques is an important source for researchers who require accurate analysis of their on- and off-site samples. Students in these fields at the graduate and post-graduate level will also benefit from this topical and comprehensive book. Provides an integrated approach for advanced analytical methods and techniques using smartphones. Covers the usage of smartphones in sample prep, integration and detection stages of analytical chemistry. Applicable for researchers of all levels, from graduate students to professionals.

The elucidation of DNA double helix in 1953 and the publication of DNA cloning protocol in 1973 have put wings under the sail of molecular biology, which has since quietly revolutionized many fields of biological science, including food microbiology. Exploiting the power and versatility of molecular technologies, molecular food microbiology extends and greatly improves on phenotypically based food microbiology, leading to the development of better diagnostics for foodborne infections and intoxications, and contributing to the design of more effective therapeutics and prophylaxes against foodborne diseases. Forming part of the Food Microbiology series, Molecular Food Microbiology provides a state of art coverage on molecular techniques applicable to food microbiology. While the introductory chapter contains an overview on the principles of current DNA, RNA and protein techniques and discusses their utility in helping solve practical problems that food microbiology is facing now and in the future, the remaining chapters present detailed molecular analyses of selective foodborne viruses, bacteria, fungi and parasites. Key Features: Contains a state of art overview on molecular techniques applicable to food microbiology research and development. Presents in-depth molecular analysis of selective foodborne viruses, bacteria, fungi and parasites. Highlights the utility of molecular techniques for accurate diagnosis and effective control of foodborne diseases. Includes expert contributions from international scientists involved in molecular food microbiology research. Represents a highly informative textbook for students majoring in food, medical, and veterinary microbiology. Offers a contemporary reference for scholars and educators wishing to keep abreast with the latest developments in molecular food microbiology. With contributions from...
international scientists involved in molecular food microbiology research, this book constitutes an informative textbook for undergraduates and postgraduates majoring in food, medical, and veterinary microbiology; represents an indispensable guide for food, medical, and veterinary scientists engaged in molecular food microbiology research and development; and offers a contemporary update for scholars and educators trying to keep in touch with the latest developments in molecular food microbiology.

Mycotoxins are poisonous chemical compounds produced by certain fungi. There are many such compounds, but only a few of them are regularly found in food and animal feedstuffs. Nevertheless, those that do occur in food and feed have great significance in the health of humans and livestock. The effects of some mycotoxins are acute, with symptoms of severe illness appearing very quickly. Other mycotoxins have longer term chronic or cumulative effects on health, including the induction of cancers and immune deficiency. Information about mycotoxins is far from complete, but enough is known to identify them as a serious problem in many parts of the world, causing significant economic losses in addition to their negative health effects. 'The mycotoxin factbook' is aimed at the latest developments to combat the mycotoxin problem. The book contains the peer-reviewed papers of the third conference of the World Mycotoxin Forum. The various chapters focus on mycotoxin food and feed risks in the context of human nutrition and animal feeding. Topics dealt with in 'The mycotoxin factbook' are: - Regulatory issues, international developments and the impact on world trade - The latest information on major mycotoxins and emerging problems in the food chain - The impact of mycotoxins in the feed chain - New developments in mycotoxin prevention - Trends in mycotoxin analysis 'The mycotoxin factbook' is a valuable resource for researchers and professionals from the food and feed industry as well as from the scientific community. This book is an ideal supplement to 'Meeting the mycotoxin menace' as published in 2004.

Effective control of pathogens continues to be of great importance to the food industry. The first edition of Foodborne pathogens quickly established itself as an essential guide for all those involved in the management of microbiological hazards at any stage in the food production chain. This major edition strengthens that reputation, with extensively revised and expanded coverage, including more than ten new chapters. Part one focuses on risk assessment and management in the food chain. Opening chapters review the important topics of pathogen detection, microbial modelling and the risk assessment procedure. Four new chapters on pathogen control in primary production follow, reflecting the increased interest in safety management early in the food chain. The fundamental issues of hygienic design and sanitation are also covered in more depth in two extra chapters. Contributions on safe process design and operation, HACCP and good food handling practice complete the section. Parts two and three then review the management of key bacterial and non-bacterial foodborne pathogens. A new article on preservation principles and technologies provides the context for following chapters, which discuss pathogen characteristics, detection methods and control procedures, maintaining a practical focus. There is expanded coverage of non-bacterial agents, with dedicated chapters on gastroenteritis viruses, hepatitis viruses and emerging viruses and foodborne helminth infections among others. The second edition of Foodborne pathogens: hazards, risk analysis and control is an essential and authoritative guide to successful pathogen control in the food industry. Strengthens the
highly successful first edition of Foodborne pathogens with extensively revised and expanded coverage Discusses risk assessment and management in the food chain. New chapters address pathogen control, hygiene design and HACCP Addresses preservation principles and technologies focussing on pathogen characteristics, detection methods and control procedures

Mycotoxins, toxic compounds produced by fungi, pose a significant contamination risk in both animal feed and foods for human consumption. With its distinguished editors and international team of contributors, Mycotoxins in food summarises the wealth of recent research on how to assess the risks from mycotoxins, detect particular mycotoxins and control them at differing stages in the supply chain. Part one addresses risk assessment techniques, sampling methods, modelling and detection techniques used to measure the risk of mycotoxin contamination and the current regulations governing mycotoxin limits in food. Part two looks at how the risk of contamination may be controlled, with chapters on the use of HACCP systems and mycotoxin control at different stages in the supply chain. Two case studies demonstrate how these controls work for particular products. The final section details particular mycotoxins, from ochratoxin A and patulin to zearalenone and fumonisins. Mycotoxins in food is a standard reference for all those concerned with ensuring the safety of food. Discusses the wealth of recent research in this important area Covers risk assessment, detection of particular mycotoxins and how to control them throughout the supply chain Describes how the risk of contamination can be controlled, including the use of HACCP systems This book provides information on the techniques needed to analyze foods in laboratory experiments. All topics covered include information on the basic principles, procedures, advantages, limitations, and applications. This book is ideal for undergraduate courses in food analysis and is also an invaluable reference to professionals in the food industry. General information is provided on regulations, standards, labeling, sampling and data handling as background for chapters on specific methods to determine the chemical composition and characteristics of foods. Large, expanded sections on spectroscopy and chromatography also are included. Other methods and instrumentation such as thermal analysis, ion-selective electrodes, enzymes, and immunoassays are covered from the perspective of their use in the analysis of foods. A website with related teaching materials is accessible to instructors who adopt the textbook.

Comprehensive Foodomics offers a definitive collection of over 150 articles that provide researchers with innovative answers to crucial questions relating to food quality, safety and its vital and complex links to our health. Topics covered include transcriptomics, proteomics, metabolomics, genomics, green foodomics, epigenetics and noncoding RNA, food safety, food bioactivity and health, food quality and traceability, data treatment and systems biology. Logically structured into 10 focused sections, each article is authored by world leading scientists who cover the whole breadth of Omics and related technologies, including the latest advances and applications. By bringing all this information together in an easily navigable reference, food scientists and nutritionists in both academia and industry will find it the perfect, modern day compendium for frequent reference. List of sections and Section Editors: Genomics - Olivia McAuliffe, Dept of Food Biosciences, Moorepark, Fermoy, Co. Cork, Ireland Epigenetics & Noncoding RNA - Juan Cui, Department of Computer Science &
Mycotoxins - toxic secondary metabolites produced by mycotoxigenic fungi – pose a significant risk to the food chain. Indeed, they may be the most hazardous of all food contaminants in terms of chronic toxicity and legislative limits on their levels in food and feed continue to be developed worldwide. Rapid and reliable methods for the determination of both mycotoxigenic fungi and mycotoxins in food and feed are therefore essential. This book reviews current and emerging methods in this area. Part one focuses on the essentials of mycotoxin determination, covering sampling, sample preparation and clean-up and key determination techniques, such as chromatographic separation, liquid chromatography-mass spectrometry and immunochemical methods. Part two then goes on to describe quality assurance, official methods and performance criteria for determining mycotoxins in food and feed. Topics covered include laboratory accreditation, method validation and measurement uncertainty. The development and analysis of biomarkers for mycotoxins are discussed in part three. Individual chapters focus on detecting exposure in humans and animals. Part four is concerned with the processes involved in determining mycotoxigenic fungi in food and feed. It also describes the identification of genes and gene clusters involved in mycotoxin synthesis, as well as DNA barcoding of toxigenic fungi. Finally, part five explores some of the emerging methods for mycotoxin
Contamination of foods and agricultural commodities by various types of toxigenic fungi is a concerning issue for human and animal health. Moulds naturally present in foods can produce mycotoxins and contaminate foodstuffs under favourable conditions of temperature, relative humidity, pH, and nutrient availability. Mycotoxins are, in general, stable molecules that are difficult to remove from foods once they have been produced. Therefore, the prevention of mycotoxin contamination is one of the main goals of the agriculture and food industries. Chemical control or decontamination techniques may be quite efficient; however, the more sustainable and restricted use of fungicides, the lack of efficiency in some foods, and the consumer demand for chemical-residue-free foods require new approaches to control this hazard. Therefore, food safety demands continued research efforts for exploring new strategies to reduce mycotoxin contamination. This Special Issue contains original contributions and reviews that advance the knowledge about the most current promising approaches to minimize mycotoxin contamination, including biological control agents, phytochemical antifungal compounds, enzyme detoxification, and the use of novel technologies.

Mycotoxins are secondary metabolites produced by fungi in a wide range of foods (cereals, peanut, tree nuts, dried fruits, coffee, cocoa, grapes, spices...) both in the field and after harvest, particularly during storage. They can also be found in processed foods of plant origin, or by transfer, in food products of animal (milk, eggs, meat and offal). Mycotoxins are of major concern since they can cause acute or chronic intoxications in both humans and animals which are sometimes fatal. Many countries, particularly in Europe, have set maximum acceptable levels for mycotoxins in food and feed. The book reviews the latest literature and innovations on important aspects of mycotoxins, e.g. mycotoxin producing fungi and the related ecosystems, mycotoxin occurrence, toxicity, analysis and management. Quantitative estimations of impacts of climate change on mycotoxin occurrence have been made recently, using predictive modelling. There is also a growing interest in the occurrence and toxicity of multiple mycotoxins in food and feed, including emerging or modified forms of mycotoxins. Innovative tools were also developed to detect and quantify toxinogenic fungi and their toxins. In order to reduce the use of chemicals that
are harmful to the environment and health of consumers, alternative methods of prevention and decontamination of mycotoxins were tested in pre- and post-harvest, using microorganisms, natural substances or radiation treatments. All relevant toxin producing fungi, their natural occurrence, the possible mycotoxicosis, further the biochemical and physiological effects of mycotoxins, their chemical data and toxicity are treated here comprehensively. For each fungi, reference is given to the food at risk. All foods which have been reported to be contaminated with mycotoxins are listed, including data on the degree of contamination, the concentration of the toxins and the country of origin and/or detection of the contaminated food.

12.2.1.2 Receptor Binding Assay

This book provides detailed data and information about the cereals and cereal products that are affected by mycotoxins, and gives a basic overview of mycotoxins in these foodstuffs. Mycotoxin contamination of food occurs as a result of crop invasion by field fungi such as Fusarium spp. and Alternaria spp., or storage fungi such as Aspergillus spp. and Penicillium spp., which can grow on/in stored commodities and are able to produce mycotoxins. In the worst case, these fungi produce secondary metabolites called mycotoxins, which can be very harmful to humans and animals when, for example, they are consumed through food due to their various negative effects on several organs in both humans and animals. Mycotoxins in Plants and Plant Products: Cereals and Cereal Products lists the predisposition of a foodstuff for mycotoxin contamination, as well as the degree of contamination, concentration, and country of detection/origin for each case of mycotoxin contamination of this kind of foodstuff. It includes both alphabetical and numerical lists of literature.

This collection features five peer-reviewed literature reviews on mycotoxin control in agriculture. The first chapter reviews advances in post-harvest detection and control of fungal contaminants in cereals. It examines abiotic factors affecting spoilage, methods for early detection of contamination and the range control measures for preventing toxin growth. The second chapter focuses on post-harvest storage and handling practices of barley grain and how these methods can be used to mitigate mycotoxin issues. The chapter also reviews the various mycotoxins and fungi that are associated with barley. The third chapter considers the current strategies available to prevent mycotoxin contamination in groundnut cultivation, focussing on peanuts. It also covers models that predict contamination, as well as the challenges associated with research and quantification of aflatoxin. The fourth chapter presents an overview of the current understanding of mycotoxin contamination of cocoa. The chapter summarises the various methods available to aid detection of mycotoxins and control further contamination. The final chapter addresses the critical safety issue of mycotoxin contamination of food waste planned for re-use. It reviews factors affecting mycotoxin growth and the particular problem of masked mycotoxins. Mycotoxins are produced worldwide by several fungi on a wide range of agricultural
commodities and are closely related to human and animal food chains. Examining mycotoxins and their impact from a public health viewpoint, this book provides an overview and introduction to the subject and examines the health, trade and legislation issues involved. Management of mycotoxins is discussed in detail as well as the global problems caused by mycotoxins.

The evaluation of the presence of mycotoxins in different matrices is achieved through different analytical tools (including quantitative or qualitative determinations). Studies of mycotoxin isolation, using chromatographyc equipment coupled to spectrometry detectors (QTrap-MS/MS, MS/MS tandem, QTOF-MS/MS), are the most useful tools to control their presence. All these studies represent key steps in the establishment of the limits of detection, limits of quantification, points of identification, accuracy, reproducibility, and repeatability of different procedures. The maximum permitted or recommended levels for mycotoxins in different matrices are within a wide range (including the levels tolerated by infants and animals). In addition, decontaminated strategies, as well as control and evaluation of exposure, are demanded by authorities and food safety systems. These authorities are not only concerned with the determination of mycotoxin presence but also with the toxicological effects of mycotoxins, and in vivo or in vitro assays are necessary for a complete evaluation. In fact, these assays are the basis for the control and prevention of population exposure to mycotoxins in dietary exposure studies. The most recent surveys focused on regulated mycotoxins (aflatoxins, fumonisins, trichothecenes, and zearalenones) and emerging toxins, such as enniatins and beauvericin in adult consumers, while very few studies have monitored mycotoxin levels in infant products. This Book of Toxins comprises 11 original contributions and one review. New findings regarding presence of mycotoxins in aromatic and medicinal plants, mango and orange juice, juices, pulps, jams, and beer, from Morocco, Pakistan, and Portugal are reported. In these studies, innovative techniques to study their presence has been developed, including liquid chromatography coupled with time-of-flight mass spectrometry to analyse mycotoxins and conjugated mycotoxins. Novel strategies to detect mycotoxin presence and comparisons the characteristics of a rapid quantitative analysis of different mycotoxins (deoxynivalenol, ochratoxin A, patulin, sterigmatocystin, and zearalenone) are also presented using acetyl- and butyrylcholinesterases and photobacterial strains of luminescent cells. Additionally, toxicological effects of zearalenone metabolites and beauvericin on SH-SY5Y neuronal cells are presented. One important point in the control of mycotoxins is related to decontaminated strategies, and in this sense the efficacy of potentially probiotic fruit-derived Lactobacillus isolates in removing aflatoxin M1 (AFM1) is presented. Other mycotoxin decontaminated techniques included in this book are electron beam irradiation (EBI) and degradation of zearalenone and ochratoxin A using ozone. Finally, a review that summarizes the newly discovered macrocyclic trichothecenes and their bioactivities over the last decade is included.

Mycotoxins, common food contaminants produced by molds, are associated with a broad range of serious toxic effects, including carcinogenicity, neurotoxicity, and reproductive and developmental toxicity, are subject to regulatory restrictions in more than 80 countries. In Mycotoxin Protocols, a panel of accomplished scientists describe their innovative, cutting-edge methods for determining the levels of various mycotoxins in foods and feeds. Almost half of the methods presented involve molecular-based immunochemical or immunochemical/chromatographic techniques. The necessary equipment, reagents, and procedures are given in great detail for the analysis of a wide variety of significant mycotoxins, including aflatoxins, aflatoxin M1, cyclopiazonic acid, ochratoxin A, trichothecenes, moniliformin, fumonisins, zearalenone, Stachybotrys toxins, citrinin, patulin, ergot alkaloids, and Alternaria toxins. General techniques for mycotoxin analyses, sampling procedures for collecting representative test samples, isolation techniques, and techniques for the detection and
identifications of toxins and impurities are also included. Up-to-date and highly practical, Mycotoxin Protocols provides a comprehensive collection of the latest bioanalytical techniques for determining mycotoxins in foods and feeds.

Foreign bodies are the biggest single source of customer complaints for many food manufacturers, retailers and enforcement authorities. Foreign bodies are any undesirable solid objects in food and range from items entirely unconnected with the food such as glass or metal fragments to those related to the food such as bones or fruit stalks. Detecting foreign bodies in food discusses ways of preventing and managing incidents involving foreign bodies and reviews the range of current methods available for the detection and control of foreign bodies, together with a number of new and developing technologies. Part one addresses management issues, with chapters on identifying potential sources of foreign bodies, good manufacturing practice (GMP), the role of the hazard analysis and critical control point (HACCP) system and how best to manage incidents involving foreign bodies. The book also includes a chapter on the laboratory identification of foreign bodies. Part two examines methods for the detection and removal of foreign bodies. There are chapters on existing methods, including metal detection, magnets, optical sorting, X-ray systems and physical separation methods. Other chapters consider research on potential new technologies, including surface penetrating radar, microwave reflectance, nuclear magnetic resonance, electrical impedance and ultrasound. Detecting foreign bodies in food is a standard reference for all those concerned with ensuring the safety of food. Discusses ways of preventing and managing incidents involving foreign bodies Reviews the range of technologies available for effective detection and control of foreign bodies

Fungi bio-prospects in sustainable agriculture, environment and nanotechnology is a three-volume series that has been designed to explore the huge potential of the many diverse applications of fungi to human life. The series unveils the latest developments and scientific advances in the study of the biodiversity of fungi, extremophilic fungi, and fungal secondary metabolites and enzymes, while also presenting cutting-edge molecular tools used to study fungi. Readers will learn all about the recent progress and future potential applications of fungi in agriculture, environmental remediation, industry, food safety, medicine, and nanotechnology. Volume 1 will cover the biodiversity of fungi and the associated biopotential applications. This volume offers insights into both basic and advanced biotechnological applications in human welfare and sustainable agriculture. The chapters shed light on the different roles of fungi as a bio-fertilizer, a bio-control agent, and a component of microbial inoculants. They also focus on the various applications of fungi in bio-fuel production, nano-technology, and in the management of abiotic stresses such as drought, salinity, and metal toxicity. Provides a deep understanding of fungi and summarizes fungi’s various applications in the fields of microbiology and sustainable agriculture Describes the role of fungal inoculants as biocontrol agents, and in improved stress tolerance and growth of plants

Mycotoxins, from the Greek "mukes" referring to fungi or slime molds and toxin from the Latin "toxicum" referencing a poison for arrows, have earned their reputation for being potentially deleterious to the health and well being of a consuming organism, whether it be animal or human. Unfortunately, mycotoxins are a ubiquitous factor in the natural life cycle of food producing plants. As such, control of the potential impact of mycotoxins on food safety relies heavily upon accurate analysis and surveys followed by commodity segregation and restricted use or decontamination through processing. The purpose of this book is to provide the most comprehensive and current information on the topic of mycotoxins and assuring food safety. Chapters represented in the book reflect such diverse topics ranging from occurrence and impact, analysis, reduction through processing and plant breeding, toxicology and safety assessments to regulatory perspectives. Authors represent a range of international perspectives.
Aflatoxins are a group of highly toxic and carcinogenic substances, which occur naturally, and can be found in food substances. Aflatoxins are secondary metabolites of certain strains of the fungi Aspergillus flavus and A. parasiticus and the less common A. nomius. Aflatoxins B1, B2, G1, and G2 are the most important members, which can be categorized into two groups according to the chemical structure. As a result of the adverse health effects of mycotoxins, their levels have been strictly regulated especially in food and feed samples. Therefore, their accurate identification and determination remain a Herculean task due to their presence in complex food matrices. The great public concern and the strict legislation incited the development of reliable, specific, selective, and sensitive analytical methods for pesticide monitoring that are discussed in this book.

Climate Change and Mycotoxins highlights the importance of the continuous study of climate change impacts on mycotoxigenic fungi and their toxins in food and feed crops. Changing climate conditions across every geographical zone greatly affect rainfall, temperature and concentration of greenhouse gases leading to loss in yield and quality of food crops. In outstanding contributions, the authors compile current evidence on the influence of climate change on mycotoxigenic fungi and mycotoxins in food crops pre- and postharvest and during storage of food and animal feed. The chemistry and biology of toxin production is revised and an outlook on control and prevention of the toxin’s impact on food and animal feed is given. The editors recommend this book to mycologists, mycotoxicologists, pathologists, epidemiologists, toxicologists, physicians, veterinarians, nutritionists, the food and feed industries, legislators, analytical chemists, microbiologists, or students of these fields. • Unique compilation on the impact of climate change on mycotoxins based on observed trends over the last 10 years. • Special focus on the implications for food and feed safety. • Latest advances on prediction and prevention of mycotoxin threats to human and animal health. About the Editors Luis M. Botana is a full Professor of Pharmacology at the University of Santiago, from 2004-2012 director of the Department of Pharmacology and former Fogarty Fellow at the School of Medicine of the Johns Hopkins University. He has been director of the European Reference Laboratory for Marine Toxins from 2004 to 2009. He is author of 25 international patents, over 300 scientific papers and editor of 10 international books. María J. Sainz is an associate Professor of Agriculture and Forage Production and Conservation at the University of Santiago de Compostela. She has been a visiting scientist at the Rothamsted Experimental Station and for ten years head of the department of Plant Production. Her research interests focus on fungal pathogen detection and diagnostics, mycorrhizal fungi in crop protection and production, and mycotoxigenic fungi and mycotoxins on forage crops and animal feed. This volume contains monographs prepared at the fifty-sixth meeting of the Joint FAO/WHO Expert Committee on Food Additives (JECFA). Five mycotoxins or groups of mycotoxins that contaminate food commodities were evaluated at the meeting: aflatoxin M1, fumonisins B1, B2, and B3, ochratoxin A, deoxynivalenol, and T -2 and HT -2 toxins. The monographs in this volume summarize the data that were reviewed on these contaminants, including information on metabolism and toxicity, epidemiology, analytical methods for their measurement in food commodities, sampling protocols, effects of processing, levels and patterns of contamination of food commodities, food consumption, and prevention and control. Based upon this information the Committee assessed the risks associated with intake of these mycotoxins.

Mycotoxins in Food Detection and Control Elsevier

Foodborne illnesses are a global public health concern with implications worldwide. Mycotoxins are naturally occurring toxins produced by microfungi that are capable of causing disease and death in living organisms. They are recognized as a major economic problem due to their impact on human health, animal productivity,
and domestic and international trade. This book provides updated information about foodborne mycotoxins, their toxicities, new determination methods, prevention strategies, and regulations around the world.

Mycotoxins are secondary metabolites produced by fungi in a wide range of foods (cereals, peanut, tree nuts, dried fruits, coffee, cocoa, grapes, spices...) both in the field and after harvest, particularly during storage. They can also be found in processed foods of plant origin, or by transfer, in food products of animal (milk, eggs, meat and offal). Mycotoxins are of major concern since they can cause acute or chronic intoxications in both humans and animals which are sometimes fatal. Many countries, particularly in Europe, have set maximum acceptable levels for mycotoxins in food and feed. The book reviews the latest literature and innovations on important aspects of mycotoxins, e.g. mycotoxin producing fungi and the related ecosystems, mycotoxin occurrence, toxicity, analysis and management. Quantitative estimation of impacts of climate change on mycotoxin occurrence have been made recently, using predictive modelling. There is also a growing interest in studying the occurrence and toxicity of multiple mycotoxins in food and feed, including emerging or modified forms of mycotoxins. Innovative tools have also developed to detect and quantify toxinogenic fungi and their toxins. In order to reduce the use of chemicals that are harmful to the environment and health of consumers, alternative methods of prevention and decontamination of mycotoxins were tested in pre- and post-harvest, using microorganisms, natural substances or radiation treatments.

Copyright: 2d78e5b7a6cabd4e95760550ea025f3f