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During the 5,000-year period from -1999 to +3000 (2000 BCE to 3000 CE), Earth will experience 11,898 eclipses of the Sun. The eclipses are distributed as follows: 4200 partial eclipses, 3956 annular eclipses, 3173 total eclipses, and 569 hybrid eclipses. The "Five Millennium Catalog of Solar Eclipses: -1999 to +3000" contains a catalog listing the date, eclipse type, and principal characteristics of every eclipse during this period. Tabulated data for each eclipse includes the catalog number, canon plate number, calendar date, Terrestrial Dynamical Time of greatest eclipse, T , lunation number, Saros number, eclipse type, Quincena Lunar Eclipse parameter, γ , eclipse magnitude, geographic coordinates of greatest eclipse (latitude and longitude), and the circumstances at greatest eclipse (i.e., Sun altitude and azimuth, path width, and central line duration). The statistics of the solar eclipse distribution over 5,000 years are investigated in detail. This includes eclipse types by month and by century, eclipse frequency in the calendar year, extremes in eclipse magnitude for all eclipse types, maximum durations of total, annular, and hybrid eclipses, and eclipse duos (two eclipses within 30 days of each other). A discussion of the major cycles in the Moon's orbit and their role in the occurrence of solar eclipses is presented. These include the synodic, the anomalistic, and the draconic months. Finally, the periodicity of solar eclipses is investigated with particular attention to the Saros cycle. Tables list the start and end dates, number, and type of eclipses of every Saros series in progress during the 5,000-year period covered by the Five Millennium Canon. The Catalog serves as a supplement to the "Five Millennium Canon of Solar Eclipses" which contains a map of every eclipse. The Canon and the Catalog both use the same solar

and lunar ephemerides as well as the same value of ΔT . This 1-to-1 correspondence between them enhances the value of each. The researcher may now search, evaluate, and compare eclipses graphically (Canon) or textually (Catalog). This document provides guidance on how to estimate measurement uncertainty (MU) and supports the enforcement of EU food and feed labelling legislation in the GMO sector. Measurement uncertainty is a parameter which is always associated with the result of a measurement, and characterises the dispersion of values attributed to that result. This measurement uncertainty needs to be estimated when compliance is investigated. The first version of this guidance document was written on request of the European Network of GMO Laboratories (ENGL) as a follow-up to a workshop on MU in the GMO sector organised by the European Commission, Joint Research Centre and was published in 2007. It was updated in 2009. The current version takes into account current EU legislation, availability of certified reference materials (CRMs) and validated quantification methods and the need for control laboratories which carry out measurements for the enforcement of EU legislation to be accredited according to ISO/IEC 17025. This guidance document contributes towards a harmonised approach for how EU Member States check compliance of food and feed samples with EU legislation. Other documents, e.g. the flexible scope accreditation document refer to this document concerning aspects related to MU.

Exposure to particles in industry and mining and from accidental anthropogenic sources constitutes an ongoing threat. Most recently nanoparticles arising from advances in technology are exposing a wider population to pathogenic stimuli. The effects of inhaled particles are no longer confined to the lung as nanoparticles have the potential to translocate to the bloodstream, the brain, and other target sites. The new

questions posed by nanoparticles underscore the importance of interdisciplinary research and exchange and highlight the need for new collaborations among disciplines in medicine, toxicology, chemistry, and material sciences. Particle Toxicology brings together the state of the science in particle physico-chemistry, cell biology, and toxicology in a single volume. While organized around the classical toxicology paradigm of exposure - dose - response, the book is unique in its emphasis on mechanistic toxicology. Preparing the reader with a brief historical overview and a conceptual framework for particle research, the book provides reviews on the mechanisms and properties of pathogenic particles and their effects on target cells at various sites in the body. The text describes how adverse effects are a consequence of deposition, translocation, and the complex issue of “dose” dominates. Contributions from leading researchers address particle-associated pro-inflammatory effects and inflammatory signaling, cellular and extracellular oxidative and nitrosative stress, particulate interactions in the pulmonary, cardiovascular, and central nervous systems, as well as genotoxic effects. Exemplar particles include quartz, asbestos, particulate material and nanoparticles. The book also covers mathematical modeling and human studies as avenues for future research. Responding to the evolving trend of consumer applications for particulate matter, Particle Toxicology provides the comprehensive resource for current knowledge from which to develop new concepts to understanding particle actions, measurement, testing, and pathogenic exposure to fine and ultrafine particles. This resource covers all areas of interest for the practicing engineer as well as for the student at various levels and educational institutions. It features the work of authors from all over the world who have contributed their expertise and support the globally working engineer in finding a solution for

today's mechanical engineering problems. Each subject is discussed in detail and supported by numerous figures and tables.

This book focuses on the evolution of sedimentary basins of the Arabian Plate and its surroundings. Because these sedimentary basins developed in various tectonic settings, from extensional or transtensional to flexural, transpressional or compressional, their sedimentary sequences provide unique records of the regional geology. Georesources of the Arabian Plate are also described here, including petroleum potential, reservoirs, water resources, fresh water and deep saline aquifers, as well as materials and ore deposits. The book is made by a set of papers authored by geoscientists working in both academia and industry. Numerous chapters describe some regional important geologic features and selected sedimentary basins from the Middle East, North Africa and the Arabian Peninsula domains. Other chapters focus on georesources. A particular focus is given to the geology of Saudi Arabia. This book is an important contribution to the geology of the Arabian Peninsula and its surroundings. In view of the strategic and economic importance of the regional geology and georesources of the Arabian Plate and Surroundings, this volume will constitute an important reference for a wide range of geoscientists interested in the geology of this region, especially those active in petroleum geosciences and related industry. Ultimately, readers will discover important thematic maps in this book.

This document provides guidance on undertaking risk assessment of all microbial hazards which may adversely affect human health in foods along a food chain. This document is also intended to provide practical guidance on a structured framework for carrying out risk assessment of microbiological hazards in foods, focussing on the four

components including hazard identification, hazard characterization, exposure assessment and risk characterization. These guidelines therefore represent the best practice at the time of their preparation, and it is hoped that they will help stimulate further developments and disseminate the current knowledge.

This book introduces the latest advances made in both fundamental studies and potential applications of upconversion nanomaterials, particularly in the field of high-resolution in vitro bioanalysis and in vivo imaging. This book starts with the synthesis and characterization, and focuses on applications ranging from materials science to biology. Above all, it describes cutting-edge advances in upconversion nanophosphor (UCNP)-based applications in multiplexed encoding, guest delivery and release systems, photodynamic therapy (PDT), solar cells, photocatalysis and so on. The major barriers that currently prevent UCNPs from being used in mainstream applications are also presented in detail. This is the first comprehensive review of the world literature on filovirus research and provides the most extensive bibliography of the subject yet published. There is special emphasis on foreign literature that has never been summarized. Every aspect of filovirus research, including their history, epidemiology, clinical picture, pathology, molecular biology, and political aspects are reviewed in detail. This book covers diverse areas in which nanoscience and nanotechnology have led to significant technological advances and practical applications, with special emphasis on novel types of nanomaterials and their applicability into a new generation of nano- and micro-devices. Different nanomaterials are reviewed with a focus on several practical application areas and their commercial utilization. Production technologies of nanomaterials are presented as one of the challenges today. Sectors where nanotechnology has already

significantly contributed are presented, along with specific nanotechnology solutions: energy related sectors, NEMS/MEMS, micro power generators, spintronics and healthcare. The basic properties and applications of nanostructured thermoelectric materials, ferroelectric and piezoelectric nanomaterials are reviewed. Examples of several developed thin-film thermogenerators are shown. A review of existing solutions and developing challenges are given regarding sustainable energy production, photovoltaics, solar cells, hydrogen economy and improved classes of batteries as contributions to green products and circular economy. Novel, highly promising areas in nanotechnology, are shown, such as voltage-driven nano-spintronics. Recent advances in friction characterisation at the nano level are described. Several proven nanomaterials have been reviewed pertaining to biomedicine. The use of nanomaterials in ophthalmology and cosmetic industry are reviewed, and the potential for silver nanoparticles and iron-based nanomaterials in biomedicine, also with recognised challenges and possible threats of non-controlled use of nanomaterials. This work is the result of joint efforts of different companies, academic, and research institutions participating in WIMB Tempus project, 543898-TEMPUS-1-2013-1-ES-TEMPUS-JPHES, "Development of Sustainable Interrelations between Education, Research and Innovation at WBC Universities in Nanotechnologies and Advanced Materials where Innovation Means Business", co-funded by the Tempus Programme of the European Union.

Statistical Aspects of the Microbiological Examination of Foods, Third Edition, updates some important statistical procedures following intensive collaborative work by many experts in microbiology and statistics, and corrects typographic and other errors present in the previous edition.

Following a brief introduction to the subject, basic statistical concepts and procedures are described including both theoretical and actual frequency distributions that are associated with the occurrence of microorganisms in foods. This leads into a discussion of the methods for examination of foods and the sources of statistical and practical errors associated with the methods. Such errors are important in understanding the principles of measurement uncertainty as applied to microbiological data and the approaches to determination of uncertainty. The ways in which the concept of statistical process control developed many years ago to improve commercial manufacturing processes can be applied to microbiological examination in the laboratory. This is important in ensuring that laboratory results reflect, as precisely as possible, the microbiological status of manufactured products through the concept and practice of laboratory accreditation and proficiency testing. The use of properly validated standard methods of testing and the verification of 'in house' methods against internationally validated methods is of increasing importance in ensuring that laboratory results are meaningful in relation to development of and compliance with established microbiological criteria for foods. The final chapter of the book reviews the uses of such criteria in relation to the development of and compliance with food safety objectives. Throughout the book the theoretical concepts are illustrated in worked examples using real data obtained in the examination of foods and in research studies concerned with food safety. Includes additional figures and tables together with many worked examples to illustrate the use of specific procedures in the analysis of data obtained in the microbiological examination of foods Offers completely updated chapters and six new chapters Brings the reader up to date and allows easy access to individual topics in one place Corrects typographic and other errors present in the

previous edition

Brewing continues to be one of the most competitive and innovative sectors in the food and drink industry. This important book summarises the major recent technological changes in brewing and their impact on product range and quality. The first group of chapters review improvements in ingredients, including cereals, adjuncts, malt and hops, as well as ways of optimising the use of water. The following sequence of chapters discuss developments in particular technologies from fermentation and accelerated processing to filtration and stabilisation processes as well as packaging. A final series of chapters analyse improvements in safety and quality control, covering such topics as modern brewery sanitation, waste handling, quality assurance schemes, and control systems responsible for chemical, microbiological and sensory analysis. With its distinguished editor and international team of contributors, *Brewing: new technologies* is a standard reference for R&D and Quality Assurance managers in the brewing industry. Summarises the major recent technological changes in brewing Reviews improvements in ingredients including cereals, malts and hops Discusses developments in fermentation, filtration and packaging technologies

When coffee professionals discuss the process of brewing coffee, the merits of certain key variables bean, roast, grind, brew temperature, and brewer are always touched upon. Unfortunately, one of the most important variables, water, is often left out of that discussion. Given that a cup of coffee is made up of 98.5% of water, and typically 95% of the espresso beverage, it is important to understand that water is an essential variable and the quality of this variable is even more important. Water used for brewing coffee must meet the high standards required for proper extraction of the flavors and aromas inherent in a Golden Cup, the Specialty Coffee

Association of America's certification of high-quality, freshly brewed coffee.

This updated edition provides research scientists, microbiologists, process engineers, and plant managers with an authoritative resource on basic microbiology, manufacturing hygiene, and product preservation. It offers a contemporary global perspective on the dynamics affecting the industry, including concerns about preservatives, natural ingredients, small manufacturing, resistant microbes, and susceptible populations. Professional researchers in the cosmetic as well as the pharmaceutical industry will find this an indispensable textbook for in-house training that improves the delivery of information essential to the development and manufacturing of safe high-quality products

"Presents the contributions made, conclusions reached and the consensus statement agreed upon at a workshop on safe management of shellfish and harvest waters held 30 November - 2 December 2004 in Kuala Lumpur, Malaysia"--Pref.

This book examines statistical techniques that are critically important to Chemistry, Manufacturing, and Control (CMC) activities. Statistical methods are presented with a focus on applications unique to the CMC in the pharmaceutical industry. The target audience consists of statisticians and other scientists who are responsible for performing statistical analyses within a CMC environment. Basic statistical concepts are addressed in Chapter 2 followed by applications to specific topics related to development and

manufacturing. The mathematical level assumes an elementary understanding of statistical methods. The ability to use Excel or statistical packages such as Minitab, JMP, SAS, or R will provide more value to the reader. The motivation for this book came from an American Association of Pharmaceutical Scientists (AAPS) short course on statistical methods applied to CMC applications presented by four of the authors. One of the course participants asked us for a good reference book, and the only book recommended was written over 20 years ago by Chow and Liu (1995). We agreed that a more recent book would serve a need in our industry. Since we began this project, an edited book has been published on the same topic by Zhang (2016). The chapters in Zhang discuss statistical methods for CMC as well as drug discovery and nonclinical development. We believe our book complements Zhang by providing more detailed statistical analyses and examples. The book is a collection of high-quality peer-reviewed research papers presented in Proceedings of International Conference on Artificial Intelligence and Evolutionary Algorithms in Engineering Systems (ICAEEES 2014) held at Noorul Islam Centre for Higher Education, Kumaracoil, India. These research papers provide the latest developments in the broad area of use of artificial intelligence and evolutionary algorithms in engineering systems. The book discusses wide variety of industrial, engineering and scientific applications of the emerging techniques. It presents invited papers from the inventors/originators of new applications and advanced technologies.

Cover -- Title Page -- Copyright -- Contents -- List of Contributors -- Chapter 1 Introduction and Overview -- 1.1 Introduction -- 1.2 Definition of Low-Moisture Foods (LMF) and Water Activity Controlled Foods -- 1.3 Salmonella as a Continuing Challenge and Ongoing Problem in Low-Moisture Foods -- 1.4 Foodborne Outbreaks of Salmonella spp. and Other Implicated Microbial Pathogens in Low-Moisture Foods -- 1.5 Major Safety Concerns in Low-Moisture Foods -- 1.6 Content and Brief Book Chapter Review -- 1.7 Goal of the Book -- 1.8 How to Use the Book -- References -- Chapter 2 Regulatory Requirements for Low-Moisture Foods - The New Preventive Controls Landscape (FSMA) -- 2.1 Introduction -- 2.2 FSMA Sanitation and cGMPs -- 2.3 FSMA Preventive Controls -- 2.4 Process Controls -- 2.5 Sanitation Controls -- 2.6 Supplier Controls -- 2.7 Summary of Requirements for Low-Moisture FSMA Regulated Products -- References -- Chapter 3 Potential Sources and Risk Factors -- 3.1 Introduction -- 3.2 Raw Ingredients Control and Handling -- 3.2.1 Identifying Vulnerable Ingredients -- 3.2.2 Supplier Management -- 3.2.3 Receiving and Transport -- 3.2.4 Segregation/Isolation of Raw, Vulnerable Ingredients -- 3.2.5 Assessment of Remediation Practices after Loss of Control (Potential Contamination of Facility) or Assessing Sanitation Practice Effectiveness -- 3.3 Pest Control -- 3.3.1 Integrated Pest Management -- 3.3.2 Web Resources for More Information -- 3.3.3 Choosing a Pest Control Partner -- 3.4 Salmonella Harborage in the Facility -- 3.4.1 Sanitation Practices that may Lead to the Spread of Pathogens -- 3.4.2 Equipment Sources -- 3.4.3

Hygienic Sources -- 3.4.4 Management Practices for Cleaning Equipment -- 3.4.5 Rolling Stock -- 3.4.6 Raw Materials -- 3.5 Conclusions -- References

For the first time, Mickey Mantle's wife, Merlyn, and their sons tells their story about life with the great American hero. Heartbreaking, tender, and often humorous, this ultimately uplifting memoir includes Mickey's own comments about his family and his personal problems--his last published words. of photos.

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.

THE BOOK OF RESULTS (HARDBACK EDITION) Casting sigils is a highly effective form of sorcery and Sherwin provides a sound overview of the process. He cuts through the cant, rhetoric and old-fashioned moral baggage associated with magical practice and shows us how to use sigils to influence the subconscious, bypassing the often contradictory and usually self-sabotaging internal dialogue of the conscious mind. Sherwin takes the process of working with sigils and develops it into a fully ritualised technique. He describes a daily regime that, at first glance, seems to owe more to Abra-Melin than to Chaos magick. Some may think he strips magic(k) of its mystery, romance and grandeur, if so you should look elsewhere if you are seeking enlightenment, union with the Divine, or fancy a chat with your Holy Guardian Angel. However, if like most of us, you simply want to create and fire a number of sigils to help you manifest your desires THE BOOK OF RESULTS provides the information you need.

For years scientists viewed the deep sea as calm, quiet, and undisturbed, with marine species existing in an ecologically stable and uniform environment. Recent discoveries have completely transformed that understanding and the deep sea

is recognized as a complicated and dynamic environment with a rich diversity of marine species. Carefully designed to provide practical information in an easily accessible format, *Methods for the Study of Deep-Sea Sediments, Their Functioning, and Biodiversity* covers how to investigate the biological components through analysis of their biodiversity. It also provides the protocols and methodological details needed to investigate some aspects of the functional biodiversity of variables commonly utilized to describe and understand the drivers of deep-sea ecosystem functioning. This volume contains detailed protocols for analyzing all benthic components from benthic viruses, prokaryotes, protozoa, foraminifera, to meio-, macro-, and megafauna. It includes step-by-step procedures, with additional notes on the crucial steps or possible difficulties arising from the analysis. Each chapter provides a brief introduction, a description of the sampling procedures and/or the sample treatment, and then the laboratory protocols, providing information on instrument setting and/or the solutions utilized. Each chapter also contains a visual scheme of the protocol for use during laboratory activities and for tracking each laboratory step. Linking information on biodiversity with the functioning of the marine ecosystems, the book covers all living components of the benthos. It provides practical information for anyone studying deep-sea habitats, their characteristics, functioning, and biodiversity.

For many biologists, statistics are an anathema; but statistical analysis of quantitative and qualitative data is of considerable importance. Although spreadsheet software provides a diverse range of statistical tools, users are usually unsure which technique should be used. This book provides the basic statistical theory and practice to understand the types of tests frequently needed for the assessment of microbiological data. No prior knowledge of statistical techniques is required.

Even when data can be given to a professional statistician for analysis, the microbiologist needs to have at least a general understanding of the underlying basis of statistical procedures in order to communicate effectively with the statistician. The book contains many worked examples to illustrate the use of the techniques and provides a plethora of references both to standard statistical works and to relevant original scientific papers on food microbiology. Basil Jarvis has had many years of experience in academic, research and industrial food microbiology and is a Past President of the Society for Applied Microbiology. He has published several edited books and more than 200 scientific articles concerned with food microbiology. NEW to this edition - chapters on Measurement Uncertainty in Microbiology, Statistical Process Control, Food Safety Objectives, Risk Assessment and Microbiological Criteria and a chapter on Validation of Microbiological Methods by Dr Sharon Brunelle, AOAC consultant. Includes additional figures and tables together with many worked examples to illustrate the use of specific procedures in the analysis of data obtained in the microbiological examination of foods.

This volume summarizes current techniques; ranging from protocols for virus growth, isolation, quantification and generation of recombinant RSV virus to procedures for the efficient characterization of the host immune response to RSV infection. These techniques are used in numerous laboratories around the world and are the building blocks that support the majority of RSV virus research. Written in the highly successful *Methods in Molecular Biology* series format, chapters include introductions to their respective topics, lists of the necessary materials and reagents, step-by-step, readily reproducible laboratory protocols, and tips on troubleshooting and avoiding known pitfalls. Authoritative and cutting-edge, *Humana Respiratory Syncytial Virus: Methods and Protocols*

aims to ensure successful results in the further study of this vital field.

The overall goal of this book is to introduce algorithms for improving the economic posture of a utility company in a restructured power system by promoting cost-effective maintenance schedules. Today, cutting operations and maintenance (O&M) costs and preserving service reliability) are among the top priorities for managers of utility companies. Preventive maintenance is perhaps the single largest controllable cost of a utility's operation. It is perceived that a careful planning and a good coordination among self-interested entities in a restructured power system are essential to achieving an optimal trade-off between the cost of maintenance and the service reliability. Traditional maintenance programs in vertically integrated utilities relied heavily on time-directed maintenance and manufacturer recommendations. This book offers a logical alternative to traditional electric utility maintenance practices and a basis for maintenance decisions. The book is organized as follows. Chapter I reviews various issues related to the power system operation and presents the role of restructuring in maintenance scheduling. In Chapter II, fundamental topics related to linear and nonlinear systems are reviewed. The duality in linear programming is discussed and integer programming is reviewed. Benders decomposition, Lagrangian relaxation, and Dantzig-Wolfe decomposition are presented. Several examples are given to demonstrate the applications of different methods. The formulation of reactive power optimization is discussed which will be used again in Chapter VII.

Expert Oracle Exadata, 2nd Edition opens up the internals of Oracle's Exadata platform so that you can fully benefit from the most performant and

scalable database hardware appliance capable of running Oracle Database. This edition is fully-updated to cover Exadata 5-2 and Oracle Database 12c. If you're new to Exadata, you'll soon learn that it embodies a change in how you think about and manage relational databases. A key part of that change lies in the concept of offloading SQL processing to the storage layer. In addition there is Oracle's engineering effort in creating a powerful platform for both consolidation and transaction processing. The resulting value proposition in the form of Exadata has truly been a game-changer. Expert Oracle Exadata, 2nd Edition provides a look at the internals and how the combination of hardware and software that comprise Exadata actually work. Authors include Martin Bach, Andy Colvin, and Frits Hoogland, with contributions from Karl Arao, and built on the foundation laid by Kerry Osborne, Randy Johnson, and Tanel Poder in the first edition. They share their real-world experience gained through a great many Exadata implementations, possibly more than any other group of experts today. Always their goal is toward helping you advance your career through success with Exadata in your own environment. This book is intended for readers who want to understand what makes the platform tick and for whom—"how" it does what it is does is as important as what it does. By being exposed to the features that are unique to

Exadata, you will gain an understanding of the mechanics that will allow you to fully benefit from the advantages that the platform provides. This book changes how you think about managing SQL performance and processing. It provides a roadmap to successful Exadata implementation. And it removes the "black box" mystique. You'll learn how Exadata actually works and be better able to manage your Exadata engineered systems in support of your business. This book: Changes the way you think about managing SQL performance and processing Provides a roadmap to successful Exadata implementation Removes the "black box" mystique, showing how Exadata actually works This book sheds new light on the chickpea genome sequencing and resequencing of chickpea germplasm lines and provides insights into classical genetics, cytogenetics, and trait mapping. It also offers an overview of the latest advances in genome sequencing and analysis. The growing human population, rapid climate changes and limited amounts of arable land are creating substantial challenges in connection with the availability and affordability of nutritious food for smallholder farmers in developing countries. In this context, climate smart crops are essential to alleviating the hunger of the millions of poor and undernourished people living in developing countries. In addition to cereals, grain legumes are an integral part of the human diet and

provide sustainable income for smallholder farmers in the arid and semi-arid regions of the world. Among grain legumes, the chickpea (*Cicer arietinum*) is the second most important in terms of production and productivity. Besides being a rich source of proteins, it can fix atmospheric nitrogen through symbiosis with rhizobia and increase the input of combined nitrogen. Several abiotic stresses like drought, heat, salinity, together with biotic stresses like *Fusarium* wilt, *Ascochyta* blight, and *Botrytis* grey mould have led to production losses, as the chickpeas is typically grown in the harsh climates of our planet's semi-arid regions.

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