

| | |
|-------------------------|--|
| 1. Record Nr. | UNINA9910502975703321 |
| Titolo | Techniques to measure food safety and quality : microbial, chemical, and sensory // edited by Mohidus Samad Khan and Mohammad Shafiur Rahman |
| Pubbl/distr/stampa | Cham, Switzerland : , : Springer, , [2021] ©2021 |
| ISBN | 3-030-68636-1 |
| Descrizione fisica | 1 online resource (478 pages) |
| Disciplina | 664.07 |
| Soggetti | Food - Safety measures Food - Analysis |
| Lingua di pubblicazione | Inglese |
| Formato | Materiale a stampa |
| Livello bibliografico | Monografia |
| Note generali | Includes index. |
| Nota di contenuto | Intro -- Preface -- Acknowledgement -- Contents -- About the Editors -- Chapter 1: Introduction on Techniques to Measure Food Safety and Quality -- 1 Introduction -- 2 Overview of Food Safety and Sensory Quality -- 2.1 Microbial Contaminations -- 2.2 Chemical Contaminations -- 2.3 Overview of the Sensory -- 3 Technological Assessment of Food Safety and Quality -- 3.1 Enzyme-Linked Immunosorbent Assay (ELISA) Technique -- 3.2 Ultraviolet-Visible Spectroscopy (UV-Vis) Technique -- 3.3 Nuclear Magnetic Resonance (NMR) Spectroscopy -- 3.4 Gas Chromatography and Mass Spectroscopy (GC-MS) Technique -- 3.5 Electronic Tongue for Food Safety -- 3.6 Paper-Based Kits for Food Analysis -- 3.7 Differential Scanning Calorimetry (DSC) -- 4 Conclusion -- References -- Chapter 2: Overview of Microbial Contamination of Foods and Associated Risk Factors -- 1 Introduction -- 2 Types of Microbial Contaminants in Foods -- 2.1 Bacteria -- 2.2 Yeast and Mold -- 2.3 Virus -- 3 Sources of Microbial Contamination -- 3.1 Preharvest Factors -- 3.1.1 Irrigation Water -- 3.1.2 Manure Applied as Fertilizer -- 3.2 Harvest Factors -- 3.3 Preslaughter and Slaughter Contamination Factors -- 3.4 Post-harvest/Slaughter Contamination Factors -- 3.4.1 Food Processing/Preparation and Serving -- 3.4.2 Unhygienic Practices of Food Handlers -- 3.4.3 Biofilm Formation in Food Processes -- 3.4.4 |

Packaging, Distribution, Marketing, and Storage -- 4 Factors
Influencing Microbial Growth in Foods -- 4.1 Intrinsic Factors -- 4.2
Extrinsic Factors -- 5 Health Impacts of Microbial Contamination
of Food -- 6 Conclusion -- References -- Chapter 3: Sources
and Health Impacts of Chemical Contaminants in Foods -- 1
Introduction -- 2 History and Background -- 3 Types of Chemical
Contaminants -- 3.1 Pesticide Residues -- 3.2 Plant-Derived
Contaminants -- 3.3 Growth Hormones and Promoters.
3.4 Veterinary Drug Residues -- 3.5 Additives and Color -- 3.6
Migrants from Processing and Packaging -- 3.7 Trace Chemicals
and Allergens -- 3.8 Dioxins -- 3.9 Polychlorinated Biphenyls -- 3.10
Emerging Environmental Organics -- 3.11 Toxic Metals and Metalloids
-- 3.12 Heat-Generated Toxicants -- 3.13 Nonthermally Generated
Toxicants -- 3.14 d-Amino Acids -- 3.15 Phycotoxins and Mycotoxins
-- 4 Health Impacts -- 5 Minimizing Chemical Contamination:
Recommendations and Alternatives -- 6 Conclusion -- References --
Chapter 4: Conventional Microbial Counting and Identification
Techniques -- 1 Introduction -- 2 Standard Plate Count to Determine
Colony-Forming Units -- 2.1 Procedures -- 2.1.1 Pour Plate Method --
2.1.2 Spread Plate Method -- 2.1.3 Drop Plate Method -- 2.1.4
Membrane Filtration Technique -- 2.2 Critical Control Points
of Standard Plate Count Method -- 2.3 Calculations for Standard Plate
Count Method -- 2.3.1 Calculation of CFUs for Surface Washed Samples
-- 2.3.2 Calculation of CFUs for Surface Swabbed Samples -- 2.4 Most
Probable Number for Statistical Determination of Viable Cells -- 2.4.1
Multiple Dilution Method -- 2.4.2 Single Dilution Method -- 2.4.3
Direct Microscopic Count -- 3 Identification Methods -- 3.1 Culturing
the Sample in Enrichment Medium -- 3.2 Isolation on Selective
Differential Agar Medium -- 3.3 Confirmation of the Isolated Cultures
-- 3.3.1 IMViC Test -- Indole Test -- Methyl Red Test -- Voges-
Proskauer Test -- Citrate Test -- 3.3.2 Catalase Test -- 3.3.3 Oxidase
Test -- 3.3.4 Urease Test -- 3.3.5 Nitrate and Nitrite Reduction Test --
4 Overview of Different Media -- 5 Conclusion -- References --
Chapter 5: Enzyme-Linked Immunosorbent Assay (ELISA) Technique
for Food Analysis -- 1 Introduction -- 2 ELISA in the Detection of Food
Constituents -- 2.1 General Technique of ELISA -- 2.1.1 Principle.
2.1.2 Main Types of ELISA -- 2.1.3 Analysis of Data -- 3 Food
Constituents Measured by ELISA -- 3.1 Flavor Constituents in Food --
3.2 Naturally Occurring Undesirable Compounds -- 3.3 Nutritionally
Important Constituents -- 4 ELISA in Food Production and Processing
-- 4.1 Detection of Plant Growth Substances -- 4.2 Estimation of Food
Constituents with Processing Characteristics -- 4.3 Spoilage of Foods
and Food Crops -- 4.4 ELISA in Food Processing -- 5 ELISA in Food
Safety -- 5.1 Common Deleterious Food Components -- 5.1.1
Clostridium perfringens Enterotoxins -- 5.1.2 Clostridium Botulinum
Toxins -- 5.1.3 Staphylococcus aureus Enterotoxins -- 5.1.4
Salmonella -- 5.1.5 Listeria monocytogenes -- 5.1.6 Other
Microorganisms -- 5.1.7 Mycotoxins -- 5.1.8 Mushroom Poisoning --
5.1.9 Algal and Seafood Toxins -- 5.2 Pesticides -- 5.3 Anabolic
Agents -- 5.4 Therapeutic Agents -- 5.5 Adulterants -- 6 ELISA
in Food Product Authenticity Testing -- 6.1 Meat Products -- 6.2 Fish
and Fish-Based Food Products -- 6.3 Dairy Products -- 6.4 Fruits
and Beverages -- 6.5 Genetically Modified Foods -- 6.6 Irradiated
Foods -- 7 Conclusion -- References -- Chapter 6: Vitek: A Platform
for a Better Understanding of Microbes -- 1 Introduction -- 2 History
and Development -- 3 Principle of Identification and Basic Steps -- 3.1
Vitek 2 -- 3.2 Vitek MS -- 4 Capacity and Microbial Database -- 5
Vitek Applications in Microbial Works -- 5.1 Clinical Applications -- 5.2

Environmental Applications -- 6 Reliability and Accuracy -- 6.1 Comparison with Phenotypic and Proteotypic Techniques -- 6.1.1 Pure and Reference Microorganisms -- 6.1.2 Clinical and Environmental Microorganisms -- 6.2 Comparison With Genotypic Techniques -- 6.2.1 Pure and Reference Microorganisms -- 6.2.2 Clinical and Environmental Microorganisms -- 7 Efficiency and Limitations -- 8 Conclusion -- References.

Chapter 7: Nuclear Magnetic Resonance Spectroscopy in Food Analysis -- 1 Introduction -- 2 Basic Principle and Theory of NMR -- 2.1 Parameters of NMR -- 2.1.1 Chemical Shift -- 2.1.2 Spin-Spin Coupling -- 2.1.3 Signal Intensity -- 2.2 NMR Spectrometer -- 2.2.1 Magnet -- 2.2.2 Shim Coils -- 2.2.3 Field Lock -- 2.2.4 Probe -- 2.2.5 Console -- 3 1D NMR -- 4 2D NMR -- 4.1 COSY -- 4.2 HMBC -- 4.3 NOESY -- 4.4 TOCSY -- 4.5 HSQC -- 5 NMR Hyphenated Techniques -- 5.1 LC-NMR -- 5.2 LC-NMR-MS -- 6 NMR Data Analyses of Foods -- 6.1 NMR-Based Metabolomics -- 6.1.1 NMR-Based Targeted Metabolomics -- 6.1.2 NMR-Based Untargeted Metabolomics -- 6.2 Chemometrics in NMR -- 6.2.1 NMR Data Processing in Chemometric -- 6.2.2 Univariate Statistical Analysis -- 6.2.3 Multivariate Statistical Analysis -- Principle Component Analysis (PCA) -- Partial Least Squares Discriminant Analysis (PLS-DA) -- Orthogonal Partial Least Square Discriminant Analysis (OPLSDA) -- 7 NMR Applications in Food Analysis -- 7.1 Fruits and Vegetables -- 7.2 Coffee and Tea -- 7.3 Vinegar -- 7.4 Oils -- 7.5 Fish -- 7.6 Juices and Beverages -- 7.7 Soy Sauce -- 7.8 Milk and Dairy Products -- 7.9 Butter and Margarine -- 7.10 Cheese -- 7.11 Honey -- 7.12 Rice -- 7.13 Wheat -- 8 Conclusion -- References -- Chapter 8: UV-Vis Spectroscopy for Food Analysis -- 1 Introduction -- 2 Basic Principles of UV-Vis Spectroscopy -- 2.1 UV-Vis Absorption Spectroscopy Mechanism -- 2.2 Instrumentation -- 3 Applications of UV-Vis Spectroscopy for Foods Analysis -- 3.1 UV-Vis Spectroscopy in Food Safety -- 3.1.1 Heavy Metal Content in Water and Food Samples: Cadmium and Copper -- 3.1.2 Indigotin (Color) in Food -- 3.1.3 Phenolic Compounds in Food -- 3.1.4 Polycyclic Aromatic Hydrocarbons (PAHs) in Oil and Food -- 3.2 UV-Vis Spectroscopy in Food Authentication -- 3.2.1 Beef Adulteration. 3.2.2 Adulteration of Milk (Melamine Detection) -- 3.2.3 Adulteration of Olive Oil -- 3.2.4 Caffeine Content in Beverage -- 3.2.5 Identification of Adulteration in Roasted Coffee -- 3.2.6 Adulteration of Pomegranate Juice -- 3.3 UV-Vis Spectroscopy in Food Composition (Food Quality) -- 3.3.1 Analyzing Fruit Composition -- 3.3.2 Freshness of Fish (K Value) -- 3.3.3 Analyzing Milk Fat -- 3.3.4 Evaluation of Edible Oil -- 3.3.5 Vitamin C in Fruits and Vegetables -- 3.3.6 Lactic Acid Content in Cheddar Cheese -- 3.3.7 Contamination in Egg White -- 4 Limitations of UV-Vis Spectroscopy to Analyze Foods -- 5 Conclusion -- References -- Chapter 9: Gas Chromatography and Mass Spectroscopy (GC-MS) Technique for Food Analysis -- 1 Introduction -- 2 Mechanism of Operation -- 2.1 Principle of GC-MS -- 2.2 Instrumentation and Working Steps of GC-MS -- 3 Sample Preparation Method -- 3.1 Solid-Phase Extraction (SPE) -- 3.2 Solid-Phase Microextraction (SPME) -- 3.3 Supercritical Fluid Extraction (SFE) -- 3.4 Pressurized Liquid Extraction (PLE) -- 3.5 Liquid-Liquid Extraction (LLE) -- 3.6 Headspace Technique -- 3.7 General Considerations -- 4 Detection of Food Items -- 4.1 Dairy Products -- 4.1.1 Cyanuric Acid (CYA) and Melamine (MEL) in Dairy Products -- 4.1.2 Major Volatile Free Fatty Acids in Cheese -- 4.2 Beverage and Juice -- 4.2.1 Polycyclic Aromatic Hydrocarbons (PAHs) in Coffee -- 4.2.2 Furan in Green Coffee, Tomato Juice, and Orange Juice -- 4.2.3 Adulteration of Ground-Roasted Coffee with Roasted Barley -- 4.3 Meat and Fish

Products -- 4.3.1 N-Nitrosamines (NAs) in Meat -- 4.3.2 Formaldehyde (FA) in Sea Fish, Freshwater Fish, and Crustaceans -- 4.4 Fruits and Vegetables -- 4.4.1 Patulin in Apple Products and Quince Jam -- 4.4.2 Benzoic and Phenolic Acids in Cranberry Fruit -- 4.4.3 Pesticides in Berry Fruits.
4.4.4 Pesticides in Tomato, Pepper, and Cucumber.
