

Reviews and resources



Food Chain Integrity: A Holistic Approach to Food Traceability, Safety, Quality and Authenticity

Edited by J. Hoorfar, K. Jordan, F. Butler and R. Prugger
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This book, which contains contributions from over 40 researchers in the field, is another in the excellent series published by Woodhead Publishing Ltd. Stimulated by the much-publicized food-borne outbreaks of listeriosis and BSE, the European Union has funded 14 research projects with a budget in excess of €140 m. Although food-related outbreaks are not confined to Europe (e.g. the contamination of infant formulas in China) the authors naturally report work conducted in the European Union. Results from other parts of the world are included through comprehensive referencing. Although Hazard Analysis of Critical Control Points (HCCP) is now well entrenched throughout the EU, demonstrably these recent outbreaks emphasize that traceability is a serious weakness in food-control systems and this topic is given priority in the opening chapters of the five sections in the book.

The first chapter of this book, 'The role of service orientation in future web-based food traceability systems', details the role that the internet may have in integrating food analysis data and identification. The chapter authors illustrate a traceability reference model using the Reference Architecture for Traceability Systems (RATIS) which endeavours to parallel the physical flow of raw materials and finished goods to the services that are available on the Web.

There is a natural flow-on to the second chapter which deals with a more practical approach to traceability using the concept of tracing (historical) and tracking (forward) bacteria and their toxins throughout the food chain: 'Biotracing'. This is a system that complements quantitative microbial risk assessment with HACCP and is achieved by integrating laboratory techniques with mathematical models to highlight critical points along the whole food chain. The cost effectiveness of traceability is discussed in Chapter 3 using the random variable (stochastic) technique to predict both costs and benefits. There is significant demand on private sector organizations to implement traceability since its

success depends on the specific nature of the operation and the technical wealth of that chain actor. The authors acknowledge that this is highly specific and raise the issue of consumer resistance to the price premiums necessary to implement this integrated system for the fresh produce supply chain.

With the enormous growth in the food industry and the rationalization of food distribution systems, they become more vulnerable to bioterrorism and criminal acts. Systems to detect bacterial, viral, fungal, protozoal, and accompanying toxins are described in Chapter 4. The review, along with the authors original elegant work, gives an insight into the power and definition that can be obtained using real time polymerase chain reaction. This is a highly specialized topic of particular interest to food inspectors, regulators, and others in the food security field.

The fifth chapter starts the second section in the book: Food Safety and Quality. The topic is ably introduced with a comprehensive, up-to-date, and logically presented review on 'Understanding and monitoring pathogen behaviour in the food chain'. The section also includes two reviews of viral risks and approaches to surveillance (Chapter 6) and then a discussion on the theoretical approach to ranking the biohazards in food (Chapter 7). Distributors of chilled foods

are well served in the book content with another review in Chapter 8, which evaluates temperature monitoring devices and techniques along the chilled food supply chain.

Chapter 9 is a short review of quality issues relating to compound animal feeds and touches on a number of factors such as *Salmonella* and mycotoxins. The use of bio-indicators in feeds is mentioned. The chapter's brevity limits discussion. Omission of issues arising from the increasing use of fishmeal (e.g. ciguatera toxin and histamine), now in common use by EU members, highlights the specificity of the book. Chapters 10 and 11 detailing the beef production chain and animal welfare, respectively, are closely referenced and comprehensive.

Issues relating to genetically modified (GM) foods are given extensive and detailed attention occupying a large portion of the book. Detection and traceability and anomalies that can arise from inadequate sampling have particular relevance to the EU but less so in nations that have a blanket prohibition of GM foods.

It is pleasing that consumers are addressed in some detail in the penultimate two chapters of the book. The progress of civilization and its accompanying, coupled with the many advances in food processing, has divorced consumers from primary food production. This

has resulted in an inherent groundswell of unease among consumers about the enormous wealth generated by the large food companies.

Section five in the book is an extremely useful list of project abstracts – a quick and easy signpost to the contents of the book.

A common thread is that the chapters are well referenced and great editorial care has been invested to make the style consistent, although full details of some acronyms are missing. Inevitably, with so many contributors, the content is variable. A number of the chapters are reviews but others include considerable original studies for estimating food

chain integrity. Nevertheless the book is a valuable addition to any food professional's library. It is possible that some of the chapters have been included to ensure that the tome is comprehensive. Because the work has been sponsored by the EU it is slanted to users in that location. As such, it is ahead of its time for developing nations, some of which do not have fully equipped food control systems in place and HACCP compliance is confined to a small number of exporting organizations.

For those working in the fields mentioned in this book, it is highly recommended.

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