

Food Safety and Toxicity

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Foreword

The rationale for this book has been the many changes in food science forced upon us by the revolution in microbial pathogenesis, changes in food processing and preservation techniques, changes in food regulations and laws particularly in food labelling, the incorporation of HACCP programs, the need for risk assessment, risk evaluation, and risk management, and finally societal changes in health consciousness. Although some of these areas have been addressed by occasional reviews or specialized texts, these are often hard to find or are too detailed for the non-specialist. Thus, in writing this text, the intention was to compile in a readable form, recent information and advances which would serve as a reference for graduate students, teachers, and professionals in food-safety, -toxicology, and -chemistry, and food scientists both in government and industry.

The authors believe that the responsibility for food safety is shared by government, producers, and consumers. Problems should be handled with an integrated approach, and scientists, public information services, health care workers, producers, policy makers, and consumers should be willing to cooperate from their own responsibility. Cooperation requires communication, since public perception of food-related hazards usually do not agree with the acknowledged health risks assessed on the basis of accepted scientific criteria. For example, there is a great deal of public concern about the effect of pesticide residues or additives. In reality however, the risks posed by either in foods is minimal, certainly when compared to microbial pathogens or plant toxins.

The book is divided into three main sections, with Part 1 subdivided into two sections. Part 1A primarily describes the chain of steps and processes (the pathway) from raw material to the consumer by integrating knowledge of food chemistry, food microbiology, and food technology. There has been no attempt to cover every area in detail but to give an in-depth treatment to areas of known focus. Part 1B incorporates a unique section on behavioral and sociological dimensions, and the effects of dietary behavior on food choice. Part 2 follows the pathway of food in the body, that is, the sequence of steps or processes food components undergo within the body. This includes membrane transport, biotransformation and interaction with targets, resulting in the induction of effects. Part 3 describes the process of risk management, including risk assessment and evaluation, standard setting, and food safety policy.

Each section is composed of series of chapters arranged in similar formats for easier and more consistent reading. Some chapters contain boxed items of highly specific interest (intermezzo). The tables within each chapter contain data specific for the United States, although where appropriate some European data are presented. At the end of each chapter is a brief summary of the main points, and a minimal number of references. The authors chose not to burden the text with a litany of articles, but instead chose the most current works that could provide a greater overview, and where necessary access to the primary literature.

I believe this is a valuable text designed to examine the many current problems and changes in food safety and toxicity. I am particularly happy to see the topic of risk

management extensively discussed, since this is an area of particular recent concern. Finally, the Food Science and Human Nutrition Department at the University of Florida teaches a graduate course in Food Toxicology and Foodborne Infections. I believe that this book is a most appropriate text for this course.

*James A. Lindsay
U.S. Editorial Advisor*

Preface

Prevention of health risks — including toxicological risks — due to food intake is central in food safety policy. The responsibility for food safety is shared by governments, producers, and consumers.

Food safety problems should be handled using an integrated approach. Scientists, public information service people, workers in the health care sector, producers, policymakers, and consumers should be willing to cooperate from their own responsibilities. Cooperation requires communication between the responsible parties about food safety. In today's society, it is increasingly important how the public perceives risk. Public perceptions of food-related hazards usually do not agree with the acknowledged health risks assessed on the basis of accepted scientific criteria. For example, there is much public concern about the effects of pesticide residues. Based on scientific criteria, however, the risks posed by pesticide residues in food are minimal: they are more than a hundred times smaller than those posed by toxins of plant and vegetable origin. With regard to food safety, educated consumers consider primarily the activities and processes that determine the exposure to food components.

Therefore, this textbook first sets out the Pathway from raw material to consumer (Part 1A), which is diagrammatically summarized in Figure 1. This pathway includes the factors determining exposure to food components.

Part 1A primarily describes the chain of steps and processes on the way from raw material to consumer by integrating knowledge of food chemistry, food microbiology, and food technology. Part 2 follows the pathway of food in the body, i.e., the sequence of steps or processes food components undergo in the body. This pathway includes membrane transport, biotransformation, and interaction with targets, resulting in the induction of effects. Part 3 concludes the book with a group of chapters treating the process of risk management.

The theme of food safety is usually approached from the viewpoint of the natural sciences. In this book, behavioral and sociological dimensions are also incorporated. When studying the factors determining exposure, attention is therefore also paid to the effects of dietary behavior on food choice (Part 1B). Part 3 assesses how far changes in dietary behavior are relevant to risk management. The concepts of risk perception and risk management are included.

Throughout this book, health risks associated with food intake are distinguished into two types: microbiological risks and toxicological risks. This distinction is not rigidly defined. Microbiological risks can be subdivided in risks of infection and risks of intoxication. In this book attention is focused on the toxicological aspects of food safety. It treats toxicological risks associated with food intake, including microbiological risks of intoxication.

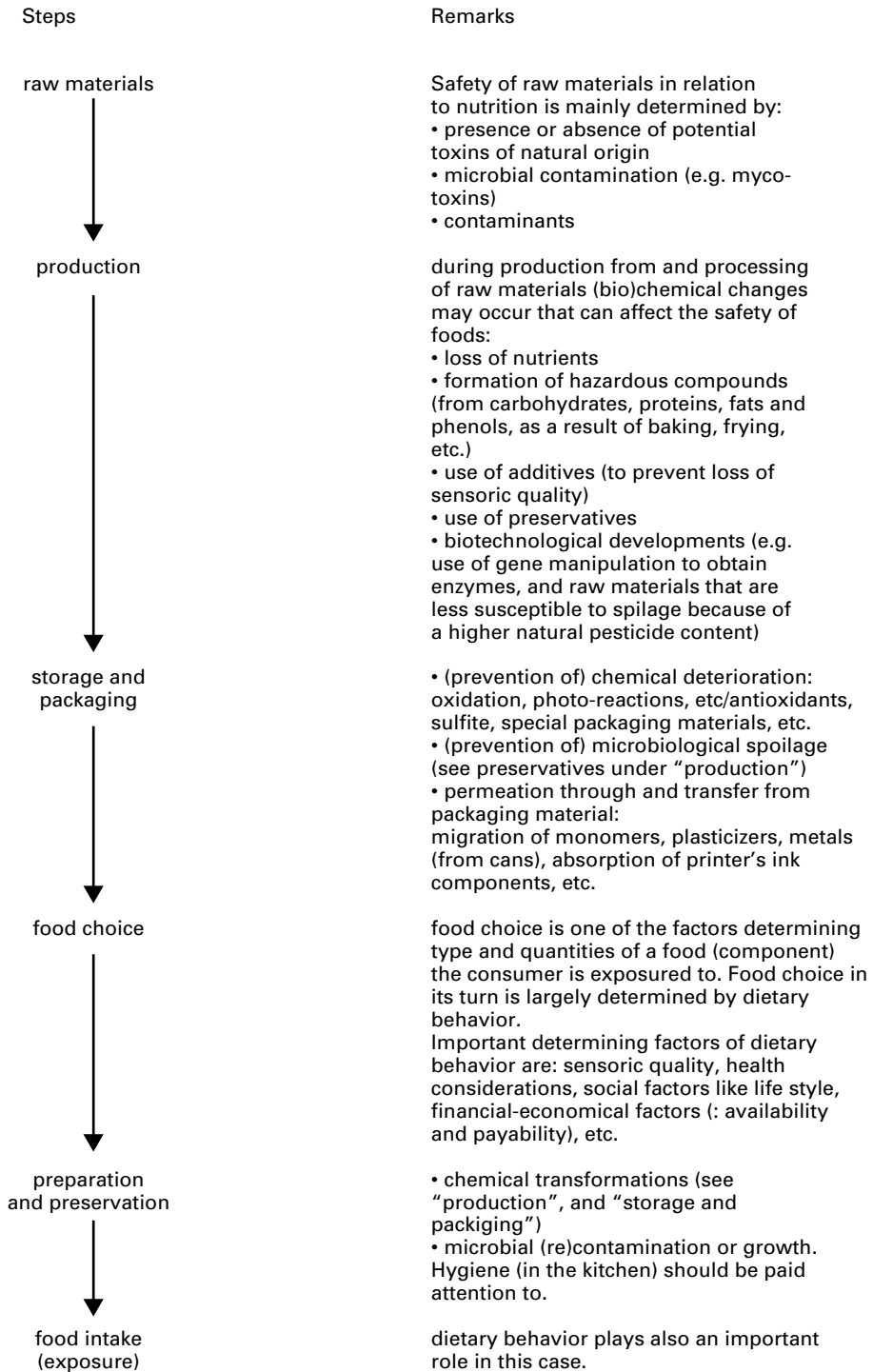


Figure 1 Pathway from raw material to consumer.

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