

Preface

A brief book will by its nature represent a compromise between methodological principles in statistics and epidemiology necessary to understand the subject and issues that are specific to the application of statistics to food science and nutrition. Therefore, the part on the methods and principles of statistics and epidemiology will cover these issues in a concise and basic manner. However, food scientists interested in statistics and epidemiology are urged to take general courses or read one of the many recommended textbooks in this area. The field of statistics is very large, and the number of journals and books is, fortunately, growing. For instance, www.springerlink.com lists 102 books available (as of April 2012) with the word *statistics* in its title.

Chapter 2, “Methods and Principles of Statistical Analysis,” provides a concise introduction to the most important principles but with an edited reference to many of the excellent textbooks available. Readers who are unfamiliar with the basics of these principles are encouraged to consult more comprehensive textbooks or take courses in statistics, research methodology, and epidemiology.

The remaining chapters will be devoted to specific topics of interest in food science and nutrition. A primary goal of food producers is to make foods of excellent quality. Therefore, Chap. 3 concerns statistics in relation to product quality and sensory analysis. The relationship between food, lifestyle, and health is more important now than ever. The number of nutritional studies is quickly expanding, and their findings are discussed in the mass media. Health claims (or risks) are being reported to the public with increasing frequency, but are the claims based on rigorous research and proper statistical analysis? In this connection, Chap. 4 will focus on nutritional epidemiology and the health effects of foods. The topic of food and health is becoming ever more vital and closely linked to other lifestyle issues such as malnutrition or obesity, for example. Proper study design and statistical analysis are therefore of core importance. Chapter 5 – the last one in this Springer Brief – is titled the “Application of Multivariate Statistics: Benefits and Pitfalls.” Food science and technology have been closely linked to the innovative use of novel multivariate statistics. These methods have been shown to have many applications and to confer numerous benefits in data analysis, and they are used especially in such areas as

spectroscopy, chemometrics, and sensory analysis. However, their complex statistical-mathematical nature is not without pitfalls. Pretreatment of data and subsequent interpretation of results may be an issue. Thus, one should have a basic understanding of the methods' statistical principles before applying them extensively.

With an educational and scientific background in food science and statistics, I have had an ongoing personal interest in finding areas where the two topics intertwine. The many inspiring discussions on study design and statistical analysis with medical researchers at Oslo University Hospital have also been instrumental to my understanding of both the possibilities and limitations of statistics and, sometimes, the beauty of a simple statistical test. I would like to thank Susan Safren and Rita Beck at Springer New York for their continuous interest and patience in the preparation of this text. Special thanks go to my parents for always encouraging me.

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