

Preface to the Second Edition

Never in the history of mankind were human food intake, nutrition, health, environment, and lifestyles so much interrelated and researched, as it is done today, in the twenty-first century. Never in human experience has food been available in this abundance and variety, as seen today, in the world. Humans (an average person) can eat convenient, refined, highly processed food with great speed, enabling them to consume about 3000 calories in 10–15 min. But, approximately, it takes a marathon (5 h) to burn 2600 calories (100 calories/mile/10 min).

Advances in food technologies in the last 200 years resulted in efficient food production and centralized, standardized processing systems, which enormously improved the general health, quality of life, and abundance of foods, eradicated many infectious and deficiency diseases, and increased life expectancy of majority of the people. Processing is accomplished by using one or more of a range of operations, including washing, grinding, mixing, cooling, storing, heating, freezing, filtering, fermenting, extracting, extruding, centrifuging, frying, drying, concentrating, pressurizing, irradiating, microwaving, and packaging. Recent advances in emerging food-processing technologies, such as high hydrostatic pressure or high-intensity electric field pulses, and minimal processing allow targeted and sophisticated modification and preservation of foods.

The researches in food science and nutrition over the last 200 years focused on five major areas:

- (a) Basic nutrient (carbohydrates, proteins, lipids) preservation and microbial safety of foods.
- (b) Micronutrient deficiency disease prevention with vitamins and minerals.
- (c) Public health efforts at eradicating nutrient deficiency by the voluntary addition of iodine to salt (1922). The fortification of other foods were also used to address public health problems such as rickets (vitamin D), beriberi (thiamin), pellagra (niacin), and dental caries (fluoride) and folate fortification for pregnant woman diet (1998). Since the initiation of fortification policies in the United States, as in many parts of the world, clinically evident nutritional deficiencies have been virtually eliminated.

- (d) Food and chronic diseases: the role of food in the cause of and treatment for chronic disease. Disease patterns shifted from infectious and nutrient deficiency diseases to increasing rates of cardiovascular disease, diabetes, cancer, obesity, neurological diseases, and osteoporosis.
- (e) Nutrition for optimal lifelong health: superfood, phytochemicals, nutraceuticals, and bioactive food components.

The chronic conditions of cardiovascular diseases, cancers, neurodegenerative diseases, obesity, osteoporosis, arthritis, diabetes, and chronic respiratory diseases emerged as the major causes of morbidity and mortality. Nutritional and epidemiological research implicated food as a major factor in the etiology of diseases.

In response to consumer demand, the food processors produced a range of new processes and products; attention is being increasingly focused on food which can confer specific health benefits, so-called functional foods, superfoods, phytochemicals, and nutraceuticals, whose further development may help the population to attain even greater health in the twenty-first century.

Foods rich in whole and unrefined vegetables, fruits, legumes, nuts, and seeds contain high concentrations of antioxidant phenolics, fibers, and numerous other phytochemicals that may be protective against chronic diseases. Whole foods are foods that are unprocessed or minimally processed, before being consumed.

Minimally processed refrigerated (MPR) fruits and vegetables are fresh, raw, whole or cut, safe foods which are usually processed and sold to consumers in a ready-to-eat, ready-to-use, ready-to-cook, ready-to-serve forms (Wiley 1994). The fresh-cut produce industry has been the fastest-growing portion of the food retail market during the past 10 years, providing consumers with convenient and nutritious food. However, fresh-cut fruits and vegetables raise food safety concerns, because exposed tissue may be colonized more easily by pathogenic bacteria than intact produce. This is due to the higher availability of nutrients on cut surfaces and the greater potential for contamination because of the increased amount of handling.

This book is an outgrowth of our research and studies at the University of Maryland, USA; INRA Avignon, France; and the METU, Turkey, over the last 35 years. The first edition of this book was the first book written on the subject of minimally processed fruits and vegetables, about 25 years ago. It was and still is a new major development in food science.

This volume contains 4 parts and 22 chapters. The book starts with an introduction and definition of the concept. The first part deals with the fundamentals of minimal processing technologies in seven chapters. The second part of the book gives some common commodities currently minimally processed in the market in eight chapters. The third part has three chapters and gives information about the emerging and new technologies in the sector. The fourth part of the book gives some information related to safety, health, and nutritional aspects of the minimal processing in five chapters.

This volume is written for food processors, engineers, and technologists, as well as nutrition experts, medical doctors, consumers, regulatory officials, graduate and undergraduate students, researchers, and other stakeholders on the subject.

I hope the book will serve to its purpose by and large.

Gölbaşı, Ankara, Turkey
January 10, 2017

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Preface to the First Edition

The objective of this book is to introduce, organize, and document the scientific, technical, and practical aspects involved with the manufacture, storage, distribution, and marketing of minimally processed refrigerated (MPR) fruits and vegetables. The overall function of these foods is to provide a convenient, fresh product for food service and retail consumers. High levels of quality accompanied by superior safety are essential requisites of MPR fruits and vegetables. Since refrigeration or chilling is essential to the quality and safety of these food products, “refrigeration” is included in the title of this book, i.e., *MP Refrigerated Fruits and Vegetables*.

This *swiftly* emerging area of processing requires organization and unification of thinking concerning fruit and vegetable food products which are not considered commercially sterile from a classical standpoint. Fruits and vegetables require very special attention because of the multitude of enzymic and respiratory factors as well as microbiological concerns which impact on the safety of low-acid and acidified vegetables and on the economic viability of high-acid fruit products of all kinds.

The name of this field, minimally processed (MP) fruits and vegetables, deserves attention in that there is little agreement among processors, produce dealers and merchants, and research workers regarding the proper term for these products. Many names are used as synonyms for MP fruits and vegetables, and these include ready-to-use, precut, lightly processed, fresh-cut, etc.; I think it behooves the food industry to settle on a single name and agree on a standard definition of this product. Doing so would benefit research and development efforts, data base searches, nutritional information needs, and the like.

The term “refrigerated” as opposed to chilled foods seems to be slightly confusing. These terms are synonymous, but probably one or the other should be selected to avoid confusion. Although the “chilled food” term may be easier to say than “refrigerated food,” in the United States (US) at least, “refrigerated” may be more recognizable by consumers.

This volume is designed to serve primarily as a reference book for those interested and involved in the minimally processed refrigerated or chilled fruit and vegetable industry. There has been an attempt to bring together historical information available from many fields developed long before the concept of “minimally

processed” foods was considered a viable field of endeavor. I have tried to gather as much knowledge as possible regarding this field but realize that there is much more research and development to be completed and that great opportunities exist in this area of food technology. The lack of information in certain areas has hampered the authors of some of the chapters. If I have been able to summarize the present knowledge of MPR fruits and vegetables and stimulate others to develop this important field in a uniform and concise manner, I think we will all feel successful.

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Finally, I thank Joy Wiley for her help and encouragement during the time that this work was being produced.

Robert C. Wiley, September 22, 1993



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