

HANDBOOK OF **FRUITS AND FRUIT PROCESSING**

SECOND EDITION

Edited by

**Nirmal K. Sinha, Jiwan S. Sidhu, József Barta,
James S. B. Wu and M. Pilar Cano**



 WILEY-BLACKWELL

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Second Edition

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Preface

Fruits are botanically diverse, perishable, seasonal, and regional commodities. They come in many forms, shapes and sizes, colors, flavors, and textures; and are an important part of a healthy diet. Some fruits have been billed as “superfruits” because of their unique nutritional properties and phytochemical composition. Low intake of fruits and vegetables has been suggested by the World Health Organization (WHO) as one of the risk factors for noncommunicable diseases such as various forms of cancers, cardiovascular diseases, diabetes, etc.

Besides vitamins, minerals, fibers, and other nutrients, fruits contain phenolic compounds having pharmacological potentials. Consumed as part of a regular diet these naturally occurring plant constituents are believed to provide a wide range of physiological benefits as antioxidants, antiallergic, anticarcinogenic, anti-inflammatory, etc. This new edition of handbook of fruits and fruit processing discusses these and other functional properties of fruits and fruit products.

According to the Food and Agriculture Organization’s (FAO) 2010 yearbook, the total production of fruits in the world increased from 470.4 million tons during 1999–2000 to 587.6 million tons in 2009. Fruits are important in global commerce. The total value of world’s fruit export and import increased from about \$45 billion during 1999–2000 to about \$105 billion in 2008. In the United States, approximately 60% fruits are consumed as processed products. The utilized production value of fruits in the United States according to USDA has increased from approximately \$10.5 billion in 2000 to \$15.02 billion in 2010. This shows the importance of fruits in agricultural productivity and growth. In most countries, there is an increasing emphasis on value-added agriculture and realization about the nutritional importance of fruits in the diet. The chapters on major fruits in this text highlight the leading fruit producing countries, production and consumption trends, and preservation and processing of fruits into various products.

Innovation, research, and development efforts in this field are aimed at improvements in production, postharvest storage and processing, safety and quality, development of new processes and products to increase demand and consumption

of fruits, and expansion of this sector. We believe a contemporary reference and source book such as this handbook, which can describe, distil, and disseminate important and relevant scientific information and advances in this field is valuable for the flow of such information. Our efforts in the second edition are to expand and improve the coverage of the original book published in 2006. Some of the major highlights of this new edition with 35 chapters include chapters on physiology and classification of fruits, horticultural biochemistry, microbiology and food safety (including HACCP, safety and regulation of fruits entering world trade), sensory and flavor characteristics, nutrition, and naturally present bioactive phenolics, postharvest physiology, storage, transportation and packaging, processing and preservation technologies (freezing, canning, aseptic processing, non-thermal technology, drying, etc.), and details on major fruits including tropical and superfruits, frozen fruits, canned fruit, jelly, jam and preserves, fruit juices, dried fruits and wines. This text is organized into five parts:

Part I: Fruit physiology, biochemistry, microbiology, nutrition, and health (five chapters)

Part II: Postharvest handling and preservation of fruits (seven chapters)

Part III: Product manufacturing and packaging (five chapters)

Part IV: Processing plant, waste management, safety, and regulations (four chapters)

Part V: Production, quality, and processing aspects of major fruits and fruit products (fourteen chapters)

This text is a joint effort of many individuals and signifies a remarkable cooperation and teamwork. The editorial team consists of five members from Asia, Europe, Middle East, and USA with expertise and experiences in this field. Four of these editors were part of the first edition. Dr. Wu with extensive teaching and industry experience specially in aseptic processing is a new editor. Each chapter has been contributed by dedicated professionals from across the globe

representing academia, government institutions, and industry. We hope this new edition with additional features would be a valuable source and reference book for students, professionals, product developers, scientists, and other professionals interested in this field. We sincerely hope this handbook addresses the needs of its readers and advances their understanding and knowledge of fruit science and technology.

We express our gratitude to all the authors and reviewers and thank them for their time and efforts. We acknowledge

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Part 1
Biology, Biochemistry, Nutrition,
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