

CONTENTS

Contributors

vii

1. Quinoa (*Chenopodium quinoa* Willd.): Composition, Chemistry, Nutritional, and Functional Properties 1

Lilian E. Abugoch James

I. Introduction	2
II. Chemical, Nutritional, and Physical Properties	4
III. Proteins	6
IV. Carbohydrates	10
V. Lipids and Lipidic Compound	15
VI. Antioxidant Capacity, Phenolic Compounds, and Flavonoids	18
VII. Saponins	18
VIII. Minerals and Vitamins	19
IX. Functional Properties	20
X. Present and Future Uses of QS	24
References	25

2. Chemoinformatics—Applications in Food Chemistry 33

Karina Martinez-Mayorga and Jose L. Medina-Franco

I. Introduction	34
II. Molecular Descriptors and Physicochemical Properties	36
III. Molecular Databases and Chemical Space	37
IV. Chemoinformatics in Food Chemistry	40
V. Examples of Molecular Similarity, Pharmacophore Modeling, Molecular Docking, and QSAR in Food or Food-Related Components	43
VI. Concluding Remarks and Perspectives	52
Acknowledgments	53
References	53

3. Processing of Food Wastes 57

Maria R. Kosseva

I. Introduction	58
II. Sources and Characterization of Food Wastes	63
III. Recovering of Added-Value Products from FVW (Upgrading Concept)	69

IV. Multifunctional Food Ingredient Production from FVW	82
V. Vegetable Residues as Bioadsorbents for Wastewater Treatment	94
VI. Using Eggshell	98
VII. Added-value Products from Whey	98
VIII. Food Waste Treatment	100
IX. FCM Aspects Aimed in Sustainable Food System Development	116
X. Summary and Future Prospects	120
References	123
4. Technological and Microbiological Aspects of Traditional Balsamic Vinegar and Their Influence on Quality and Sensorial Properties	137
Paolo Giudici, Maria Gullo, Lisa Solieri, and Pasquale Massimiliano Falcone	
I. Introduction	138
II. Basic Technology	148
III. Chemical Composition	168
IV. Physical Properties	176
V. Conclusion	177
References	178
5. Nanostructured Materials in the Food Industry	183
Mary Ann Augustin and Peerasak Sanguansri	
I. Introduction	184
II. Approaches for Nanoscale Manipulation of Materials	185
III. Processes for Structuring of Food Materials	185
IV. Nanostructured Materials	192
V. Functionality and Applications of Nanostructured Materials	199
VI. Nanotechnology and Society	206
VII. The Future	206
Acknowledgment	207
References	207
6. Gossypol-A Polyphenolic Compound from Cotton Plant	215
Xi Wang, Cheryl Page Howell, Feng Chen, Juanjuan Yin, and Yueming Jiang	
I. Overview of Cotton and Cottonseed Products	216
II. Occurrence of Gossypol	218
III. Physiochemical Properties of Gossypol	218
IV. Gossypol Analyses	226
V. Agricultural Implication	228
VI. Biological Properties	233
VII. Clinical Implication	249
VIII. Conclusions	251
References	251
<i>Index</i>	265