

Contents

Contributing Authors vii

Preface and Acknowledgments ix

List of Abbreviations xi

Part I. General Information

1. Introduction to Food Analysis 3
S. Suzanne Nielsen
2. United States Government Regulations and International Standards Related to Food Analysis 15
S. Suzanne Nielsen
3. Nutrition Labeling 35
S. Suzanne Nielsen and Lloyd E. Metzger
4. Evaluation of Analytical Data 51
J. Scott Smith
5. Sampling and Sample Preparation 65
Andrew Proctor and Jean-François Meullenet

Part II. Compositional Analysis of Foods

6. Moisture and Total Solids Analysis 81
Robert L. Bradley, Jr.
7. Ash Analysis 103
Leniel H. Harbers and S. Suzanne Nielsen
8. Crude Fat Analysis 113
David B. Min and Jeff M. Boff
9. Protein Analysis 131
Sam K. C. Chang
10. Carbohydrate Analysis 143
James N. BeMiller

11. Vitamin Analysis 175
*Ronald R. Eitenmiller and
W. O. Landen, Jr.*

12. Mineral Analysis 189
*Charles E. Carpenter and
Deloy G. Hendricks*

Part III. Chemical Properties and Characteristics of Foods

13. pH and Titratable Acidity 207
George D. Sadler and Patricia A. Murphy
14. Fat Characterization 227
Oscar A. Pike
15. Protein Separation and Characterization Procedures 247
Denise M. Smith
16. Application of Enzymes in Food Analysis 269
Joseph R. Powers
17. Immunoassays 287
Peter Sporns
18. Agricultural Biotechnology (GMO) Methods of Analysis 301
*Anne R. Bridges, Kimberly M. Magin, and
James W. Stave*
19. Analysis of Pesticide, Mycotoxin, and Drug Residues in Foods 315
William D. Marshall
20. Analysis for Extraneous Matter 341
John R. Pedersen
21. Determination of Oxygen Demand 351
Yong D. Hang

Part IV. Spectroscopy

22. Basic Principles of Spectroscopy 359

Michael H. Penner

23. Ultraviolet, Visible, and Fluorescence Spectroscopy 371

Michael H. Penner

24. Infrared Spectroscopy 387

Randy L. Wehling

25. Atomic Absorption and Emission Spectroscopy 401

Dennis D. Miller and Micheal A. Rutzke

26. Mass Spectrometry 423

*J. Scott Smith and Rohan A. Thakur***Part V. Chromatography**

27. Basic Principles of Chromatography 437

Mary Ann Rounds and S. Suzanne Nielsen

28. High Performance Liquid Chromatography 461

Mary Ann Rounds and Jesse F. Gregory, III

29. Gas Chromatography 479

*Gary A. Reineccius***Part VI. Physical Properties of Foods**

30. Rheological Principles for Food Analysis 503

Christopher R. Daubert and E. Allen Foegeding

31. Thermal Analysis 517

Timothy W. Schenz

32. Color Analysis 529

*F. Jack Francis**Index 543*