

CONTENTS

CONTRIBUTORS, LIST OF PARTICIPANTS-COMMITTEE, CHAIRMAN, SPEAKERS, OTHER PARTICIPANTS	vii
PREFACE	xiii
FOREWORD	xv

Section 1

Water and its Molecular Interaction with Other Constituents of Biological Systems

1. Water, Ice and Solutions of Simple Molecules	3
2. Water-Carbohydrate Interactions	23
3. Water-Phospholipid Interactions	37
4. Protein Hydration-Its Role in Stabilizing the Helix Conformation of the Protein	73
5. The Physical Properties of Water Associated with Biomacromolecules	93
6. Water in Plant Tissues and Frost Hardiness	111

Section 2

Methods and Criteria used in the Study of Water in Foods

7. Recent Advances in Techniques for the Determination of Sorption Isotherms	139
8. Interpretation of Sorption Data in Relation to the state of Constituent Water	155
9. Solvent versus Non-solvent Water in Starch-Alcohol-Water Systems	173
10. Solvent versus Non-solvent Water in Casein-Sodium Chloride-Water Systems	183
11. Differential Thermal Analysis and Differential Scanning Calorimetry in the Study of Water in Foods	193
12. Dielectric Properties of Foods in Relation to Interactions between Water and the Substrate	221
13. Some Applications of Wide-line and Pulsed Nuclear Magnetic Resonance in Investigations of Water in foods	233
14. Electron Microscopy in the Study of Immobilized Water	249

Section 3

Water in Relation to the Behaviour of Micro-organisms

15. Xerophilic Fungi and the Spoilage of Foods of Plant Origin	273
16. The Significance of Water Activity for Micro-Organisms in Meats	309
17. The Effect of Water Activity on the Heat Resistance of Bacteria	325
18. The Influence of Relative Humidity on the Thermal Resistance of Mould Spores	339
19. Water and Micro-organisms in Foods-A Synthesis	347

Section 4

Influences of Water on Enzyme Action in Foods

20. Enzymic Reactions in Low Moisture Foods	365
21. Water Activity in Relation to the Thermal Inactivation of Enzymic Proteins	379
22. Activity of Enzymes in Partially Frozen Aqueous Systems	397

Section 5

Non-enzymic Chemical Changes at Low and Intermediate Moisture Contents

23. The Influence of Water Content on Non-enzymic Browning Reactions in Dehydrated Foods and Model Systems and the Inhibition of Fat Oxidation by Browning Intermediates	417
24. Free Radicals in Low Moisture Systems	435
25. Oxidative Changes in Foods at Low and Intermediate Moisture Levels	455

Section 6

Effects Associated with Freezing and Thawing

26. The Physico-Chemical Environment during the Freezing and Thawing of Biological Materials	477
27. The Effects of Freezing and Thawing on Food Quality	505
28. Reaction Kinetics in Partially Frozen Aqueous Systems	539

Section 7

Aspects of the Condition and Properties of Water in Relatively Moist Food Materials

29. Physico-Chemical Studies of Water in Meat	559
30. Some Effects of Water in Wheat Flour Doughs	573
31. Interactions between Water and Surface Active Lipids in Food Systems	587
32. The Lowering of Water Activity by Order of Mixing in Concentrated Solutions	613
33. The Influence of Water on Textural Parameters in Foods at Intermediate Moisture Levels	627
34. Physico-Chemical Modification of the State of Water in Foods-A Speculative Survey	639
35. Envoi	659
AUTHOR INDEX	663
SUBJECT INDEX	687