

Contents

List of Contributors	xiii
List of Participants	xvii
Foreword	xix
Preface	xxiii

PART I SOCIAL, DEVELOPMENTAL, AND ANTHROPOLOGICAL ASPECTS OF SALT INTAKE

Chapter 1	Salt and Social Behavior	
	<i>Marilyn S. Fregly</i>	
I.	Introduction	3
II.	Sodium and the Paleorations	4
III.	Variability of Salt Intake	6
IV.	Salt and Social Organization	8
V.	Salt and Political Patterns	9
	References	11
Chapter 2	Saltiness in Developmental Perspective	
	<i>James M. Weiffenbach, Patricia A. Daniel, and Beverly J. Cowart</i>	
I.	Developmental Change	14
II.	Development of the Taste System	16
III.	Patterns of Environmental Exposure to Salt	21
IV.	Summary	25
V.	Prospects	25
	References	26

Chapter 3	Saharan Bedouins and the Salt Water of the Sahara: A Model for Salt Intake	
	<i>Claude Paque</i>	
I.	Introduction	31
II.	Methods	32
III.	Results	32
IV.	Discussion	38
V.	Conclusions	44
	References	45
 Chapter 4	 Salt Sources and Markets	
	<i>William E. Dickinson</i>	
I.	Introduction	49
II.	Salt Production	50
III.	Uses of Salt	50

PART II

COMPARATIVE AND PSYCHOPHYSICAL ASPECTS OF SALT INTAKE

Chapter 5	On the Spontaneous Intake of NaCl Solution by Dogs	
	<i>Melvin J. Fregly</i>	
I.	Introduction	55
II.	Methods	56
III.	Results	58
IV.	Discussion	64
V.	Summary	66
	References	67
 Chapter 6	 Comparative Aspects of Salt Preference and Intake in Birds	
	<i>B. Robinson, M. R. Kare, and G. K. Beauchamp</i>	
I.	Introduction	69
II.	Method	70
III.	Results	70
IV.	Discussion	72
V.	Summary	78
	References	79

Chapter 7	Sensory Analysis of the Taste of NaCl	
	<i>Linda M. Bartoshuk</i>	
I.	Source of Saltiness: Cations	83
II.	Sweetness of Salts	85
III.	Adaptation	87
IV.	Cross-Adaptation among Salts	91
V.	Cross-Adaptation among NaCl, Citric Acid, Sucrose, Caffeine, and Urea	93
VI.	Mixtures Containing NaCl	95
VII.	Summary	96
	References	96
Chapter 8	Contribution of the Anion to the Taste Quality of Sodium Salts	
	<i>Susan S. Schiffman</i>	
I.	Introduction	99
II.	Methods	100
III.	Results	102
IV.	Discussion	109
V.	Summary	110
	References	110
Chapter 9	Salivary Chloride Levels, Taste Thresholds for Salt, and Food Ingestion	
	<i>Howard H. Chauncey, Sharon Wallace, and John E. Alman</i>	
I.	Introduction	113
II.	Methods	114
III.	Results	119
IV.	Discussion	122
V.	Summary	123
	References	124
Chapter 10	Measuring Taste Sensitivity and the Effects of Adrenalectomy in Rats	
	<i>G. Rolfe Morrison</i>	
I.	Introduction	127
II.	Method	128
III.	Results	129
IV.	Discussion	132
V.	Summary	136
	References	136

PART III

FACTORS AFFECTING SALT PREFERENCE

Chapter 11	Salt Intake and Equilibration	
	<i>E. F. Adolph</i>	
	Text	141
	References	144
Chapter 12	Factors Affecting Salivary Sodium Concentration, NaCl Intake, and Preference Threshold and Their Interrelationships	
	<i>Terry N. Thrasher and Melvin J. Fregly</i>	
I.	Introduction	145
II.	Effects of Partial or Total Salivariectomy on Sodium Chloride Preference	146
III.	Effect of Sequential Alterations in Salivary Electrolyte Concentration on Preference for NaCl	156
IV.	Effect of Adrenalectomy and DOC or Oral Contraceptives on Salivary Sodium Concentration	159
V.	Summary	164
	References	164
Chapter 13	A Possible Role for Angiotensin in the Elicitation of Salt Appetite	
	<i>R. W. Bryant, A. N. Epstein, and S. J. Fluharty</i>	
I.	Introduction	167
II.	General Methods	168
III.	Discussion	181
	References	183
Chapter 14	The Physiological Basis of Sodium Appetite: A New Look at the "Depletion-Repletion" Model	
	<i>Edward M. Stricker</i>	
I.	Introduction	185
II.	The Model	186
III.	Evaluation of the Model	192
IV.	Implications	199
V.	Conclusions	201
	References	202

Chapter 15	Rapid Sodium Depletion and Salt Appetite Induced by Intraperitoneal Dialysis	
	<i>John L. Falk and Maisy Tang</i>	
I.	Introduction	205
II.	The Depletion of Sodium by Transperitoneal Dialysis	206
III.	Postdialysis NaCl Appetite—Is It Learned?	210
IV.	Postdialysis NaCl Appetite—Is It Specific?	211
V.	The Postrepletonal Persistence of NaCl Intake	212
VI.	The Postrepletonal Renal Conservation of Sodium	216
VII.	Summary	218
	References	219
Chapter 16	Salt in Processed Foods	
	<i>Richard H. Forsythe and Ralph A. Miller</i>	
I.	Introduction	221
II.	Salt Intake	222
III.	Salt Added to Enhance Flavor	224
IV.	Salt as a Functional Ingredient	225
V.	The Future Situation	227
VI.	Conclusion	228
	References	228
Chapter 17	The Influence of Reproductive Processes on Salt Appetite	
	<i>D. A. Denton and J. F. Nelson</i>	
I.	Introduction	229
II.	Satiation of Salt Deficiency in the Wild Rabbit	230
III.	Salt Appetite in Pregnancy and Lactation	232
	References	245
Chapter 18	Spontaneous NaCl Appetite Induced by Administration of an Oral Contraceptive and Its Components to Rats	
	<i>Melvin J. Fregly and Deborah G. Newsome</i>	
I.	Introduction	248
II.	Methods	248
III.	Results	252
IV.	Discussion	265

V.	Summary	270
	References	271

PART IV NEUROLOGICAL ASPECTS OF SALT INTAKE

Chapter 19	Membrane Transitions in Taste Receptor Cell Activation by Sodium Salts	
	<i>Gregory Mooser</i>	
I.	Introduction	275
II.	Theory	276
III.	Application to Taste Receptor Cell Activation by Sodium Salts	278
IV.	Materials and Methods	280
V.	Results	280
VI.	Discussion	283
	References	286
Chapter 20	Peripheral Mechanisms in Salty Taste Reception	
	<i>Joseph G. Brand and Douglas L. Bayley</i>	
I.	Introduction	289
II.	Possible Involvement of Reduced Pyridine Nucleotide in Salty Reception	293
III.	Summary	296
	References	297
Chapter 21	Peripheral Neural Changes Associated with Sodium Deprivation	
	<i>Robert J. Contreras</i>	
I.	Sodium Intake, a Manifestation of Homeostasis	300
II.	Role of Gustation in Control of Salt Intake	300
III.	Behavioral and Physiological Effects of Sodium Deprivation	301
IV.	Sodium Deprivation Alters Peripheral Neural Responses to Gustatory Stimuli	305
V.	Adrenalectomy versus Sodium Deprivation	312
VI.	Summary	313
	References	314

PART V
PHYSIOLOGICAL AND PATHOLOGICAL ASPECTS OF
SALT INTAKE

Chapter 22	Glycinamide Hydrochloride: A Compound with Common Salt Flavor <i>M. Sternberg, D. A. Cornelius, N. J. Eberts, F. J. Schwende, and J. P. C. Chiang</i>	
I.	Introduction	319
II.	Synthesis of Glycinamide Hydrochloride	321
III.	Toxicity Studies	321
IV.	Organoleptic Evaluations: Flavor Profile and Flavor Threshold	322
V.	Summary	328
	References	328
Chapter 23	Brain Lesions and Sodium Appetite: An Approach to the Neurological Analysis of Homeostatic Behavior <i>George Wolf and Jay Schulkin</i>	
I.	Introduction	331
II.	Methods	332
III.	Results	334
IV.	Discussion	336
	References	339
Chapter 24	On the Role of Sodium in Human Hypertension <i>Frederic C. Bartter, Toshiro Fujita, Catherine S. Delea, and Terukazu Kawasaki</i>	
I.	Introduction	341
II.	Methods	341
III.	Results	342
IV.	Discussion	343
V.	Summary	344
	References	344
Chapter 25	Salt Intake and Hypertension in Rats <i>Kunio Torii</i>	
I.	Introduction	345
II.	Method and Results	347

III.	Conclusions	360
	References	362
Chapter 26	Salt Taste and Salt Preference in Normal and Hypertensive Rats and Humans	
	<i>Robert I. Henkin</i>	
I.	Salt Taste Studies	367
II.	Rat Preference Studies	376
III.	Human Preference Studies	382
IV.	Effects of Antihypertensive Treatment	390
	References	394
Chapter 27	Taste and Salt Intake in Human Hypertension	
	<i>R. A. Bernard, R. L. Doty, K. Engelman, and R. A. Weiss</i>	
I.	Introduction	397
II.	Methods	399
III.	Results	402
IV.	Discussion	406
V.	Summary	408
	References	408
Chapter 28	Biological and Behavioral Aspects of Salt Intake: A Summation	
	<i>V. G. Dethier</i>	
	Text	411
Index		419