

Contents

Chapter	Page	Chapter	Page
I. Executive Summary	1	VI. Alternative Open-Dating Systems	39
Consumer Concerns	1	Voluntary System, ..,	39
Background.	3	Mandatory System.,.	39
State Practices	3	Voluntary/Mandatory System	41
Practices in Other Countries .,	3	VII. Enforcement and Liability	43
Findings and Conclusions.	5	Methods o fEnforcement	43
Overall Findings	5	Before-Date Enforcement	43
Specific Findings	5	Beyond-Date Enforcement	44
Benefits.,	5	Federal/State Enforcement	45
costs	6	Liability,	46
Open-Dating Techniques	6	Liability Under the Food, Drug, and	
Criteria in Establishing Open Dates	7	Cosmetic Act	46
Enforcement and Liability	7	Civil Liability. ,.....	47
Congressional Options	8	VIII. Economic and Social Costs	49
Voluntary System	8	Costs of Open Dating	49
Mandatory System	9	Establishing Shelf Life.	49
Congress Specifies the Detail.	9	Dating the Package.	49
Leave Implementation of Detail		Enforcement ,.....,	49
to Others	10	Comparison With Nutrition Labeling.	50
Voluntary/Mandatory System , .., .	11	Impact.	50
II. Consumer Perspective on Open Dating.	13	Processors,	50
Attitudes Toward Open Dating	13	Wholesalers and Retailers	50
Understanding Open Dates	14	Consumers	50
Preference Among Open Dates	15	Government	51
Differences Among Subgroups of		IX. Array of Congressional Options	53
Shoppers.	18	Congressional Options	53
III. Benefits of Open Dating.	19	Appendixes	
Food Quality..	20	A. Application of Open Dating to	
Nutrition.,	20	Specific Foods	59
Food Safety.,...	21	B. Basic Food Preservation and	
Inventory Control.	21	Deterioration Modes. ,	77
Education ,,	21	c. Technological Evaluation of Shelf Life	
IV. Alternative Open-Dating Techniques . .	23	of Foods. ,.,	87
Method of Open Dating. ,	23	D. Status of Open Shelf-Life Dating	
Pack Date	23	Regulations for Selected Countries	
Sell-by and Best-if-Used-by Dates. . . .	24	and International Food Labeling	
To Remain in Grade Use-(Sell-)		Organizations, 1978.	103
by Date	26	E. Bibliography,	105
Combination Dates	26		
Implementation,	27		
Storage Instructions.	27		
Type of Date Marking.	27		
Exemptions.	28		
v. Establishing Open Dates	31		
Alternative Criteria	34		
Sensory Quality	34		
Nutrient Loss	35		
Perishability Time Categories	36		
Scientific Tests and Data Needed	36		
Impact on Technology Development	37		

LIST OF TABLES

Table No.	Page
1. Summary of Open-Date Labeling Requirements by States, 1978	4
2. Consumer Usefulness of Information on Food Packages	14
3. Consumer Understanding of Freshness Dates.	14
4. Consumer Preferences for Open Dates.	15

Table No.	Page
5. Major Modes of Deterioration, Critical Environmental Factors. Shelf Life, and Type of Open Dating by Food Product . .	32
C-1. Weeks of Shelf Life at a Given Temperature for Given Q_{10}	93

LIST OF FIGURES

Figure No.	Page
1. Example of Interaction of Congressional Options	54
B-1. Moisture Content v. Water Activity. . . .	83
B-2. Effect of a_w on Rate.	83
C-1. Nomogram of Temperature, Time, and Quality for the Military Ration Items Used in the Long-Term Storage Tests ., .	88

Figure No.	Page
C-2. Constant Shelf Life Lost	90
C-3. First-Order Degradation	90
C-4. First-Order Log Plot	91
C-5. Initial Quality Gain Prior to First-Order Degradation	91
C-6. Shelf-Life Plot	92
C-7. Temperature/Time History	93
C-8. Sequential Regular Fluctuating Profile. .	95
C-9. Moisture Gain.	97
C-10. Storage Conditions	98
C-11. Shelf Life as a Function of a_w and Temperature. .,	99
C-12. Calculated Moisture Content v. Time. . .	100
C-13. Senescence Rate as a Function of O ₂ ., .	101
C-14. Rates of Permeation and Respiration Of oz.	101