

Contents

Contributors	xi
Preface	xii
Abbreviations	xiv
<hr/>	
PART 1 Environmental Management Systems: Applications and Potential	1
1 Potential and Representatives for Application of Environmental Management System (EMS) to Food Industries	3
<i>Ioannis S. Arvanitoyannis</i>	
Current state of Environmental Management System (EMS) implementation	4
Emissions and wastewater management	4
Food industry and agricultural waste	6
Beverage industry	9
Fruit and vegetable industry	9
Meat and poultry	10
Agricultural waste	10
Effects of pollution on organisms	12
Glass, chemicals and other products	13
Environmental attitudes and politics	15
Progress in alternative energy	16
Environmental impact assessment	19
2 ISO 14000: A Promising New System for Environmental Management or Just Another Illusion?	39
<i>Ioannis S. Arvanitoyannis</i>	
Introduction of ISO 14000	39
The emergence of global environmental awareness	40
Technical Committee 207 (TC 207)	43

	Environmental management systems (EMS)	45
	Benefits of implementing ISO 14000	49
	ISO 14000: a new approach	50
	ISO 14001. what it is and what it is not	51
	Similarity of ISO 14000 to other programs	53
	Applications of ISO 14000	59
	ISO 14000 and banks	61
	ISO 14000 and governments/education	62
	ISO 14001 implementation	63
	ISO 14010 – Environmental auditing	68
	Brief presentation of new ISO 14001:2004	71
	Overview of case studies reported on implementation of ISO 14001	72
3	ISO 14040: Life Cycle Assessment (LCA) – Principles and Guidelines	97
	<i>Ioannis S. Arvanitoyannis</i>	
	The concept of LCA	97
	The structure of LCA	98
	Examples of LCA studies on food production systems	99
	LCA case studies reported	106
	LCA in the future	126
	PART 2 Environmental Legislation	133
4	Presentation and Comments on EU Legislation Related to Food Industries – Environment Interactions	135
	<i>Ioannis S. Arvanitoyannis, Persefoni Tserkezou and Stefania Choreftaki</i>	
	Introduction	135
	Topics/categories covered under EU legislation	138
5	Presentation and Comments on USA and Canada Legislation Related to Food Industries – Environment Interactions	289
	<i>Ioannis S. Arvanitoyannis and Persefoni Tserkezou</i>	
	Introduction	289
	US legislation for environment	293
	Canadian legislation for environment	317
	PART 3 Waste Treatment Methodologies	343
6	Food Waste Treatment Methodologies	345
	<i>Ioannis S. Arvanitoyannis, Aikaterini Kassaveti and Demetrios Ladas</i>	
	Introduction	345
	Treatment methods	359

PART 4 Waste Treatment Methodologies of Foods of Plant Origin	411
7 Wine Waste Management: Treatment Methods and Potential Uses of Treated Waste	413
<i>Ioannis S. Arvanitoyannis, Demetrios Ladas and Athanasios Mavromatis</i>	
Introduction	413
Wine waste treatment methods	418
Main applications/constituents to be exploited	429
8 Olive Oil Waste Management: Treatment Methods and Potential Uses of Treated Waste	453
<i>Ioannis S. Arvanitoyannis and Aikaterini Kassaveti</i>	
Introduction	453
Olive oil production process and properties of OMW	454
Treatment methods	456
Uses	490
Disadvantages of several olive oil waste treatment methods	539
Inputs and outputs in olive oil industry	552
9 Fruit/Fruit Juice Waste Management: Treatment Methods and Potential Uses of Treated Waste	569
<i>Ioannis S. Arvanitoyannis and Theodoros H. Varzakas</i>	
Introduction	569
Treatment methods	570
Treatment of industrial water effluents	575
Uses of fruit wastes	578
Comparison of waste treatment methods	619
Conclusions	619
10 Cereal Waste Management: Treatment Methods and Potential Uses of Treated Waste	629
<i>Ioannis S. Arvanitoyannis and Persefoni Tserkezou</i>	
Introduction	629
Treatment methods	631
Uses of wheat, corn, rice, barley and oat wastes	681
11 Vegetable Waste Management: Treatment Methods and Potential Uses of Treated Waste	703
<i>Ioannis S. Arvanitoyannis and Theodoros H. Varzakas</i>	
Introduction	703
Treatment methods	704
New waste management technologies	715
Identification of different compounds in vegetable waste	716
Comparison of waste treatment methods	730
Conclusions	752

PART 5	Waste Treatment Methodologies of Foods of Animal Origin	763
12	Meat Waste Management: Treatment Methods and Potential Uses of Treated Waste	765
	<i>Ioannis S. Arvanitoyannis and Demetrios Ladas</i>	
	Introduction	765
	Primary treatment	768
	Secondary treatment	771
	Uses	782
13	Dairy Waste Management: Treatment Methods and Potential Uses of Treated Waste	801
	<i>Ioannis S. Arvanitoyannis and Aikaterini Kassaveti</i>	
	Introduction	801
	Treatment methods	804
	Uses	819
	Inputs and outputs in dairies	844
14	Fish Waste Management: Treatment Methods and Potential Uses of Treated Waste	861
	<i>Ioannis S. Arvanitoyannis and Aikaterini Kassaveti</i>	
	Introduction	861
	Treatment methods	864
	Uses of fish waste	882
	Inputs and outputs in fisheries	924
PART 6	Food Packaging Waste Treatment	939
15	Waste Management in Food Packaging Industries	941
	<i>Ioannis S. Arvanitoyannis</i>	
	Introduction	941
	Glass	950
	Aluminum	958
	Paper/carton	975
	Polymers	980
Index		1047
Series		1069