

Contents

<i>Contributor contact details</i>	xi
<i>Introduction</i>	xv
1 Meat quality and consumer requirements	1
<i>G. C. Mead, formerly Royal Veterinary College, UK</i>	
1.1 Introduction	1
1.2 Meat quality: concept and characteristics	3
1.3 Food safety: poultry microbial hazards	4
1.4 Ethical concerns: animal welfare, genetic modification and organic production	12
1.5 Quality improvement, consumer demands and the structure of this book	14
1.6 Future trends	16
1.7 Sources of further information	17
1.8 References	18
2 Breeding and quality of poultry	21
<i>C. Berri, INRA, France</i>	
2.1 Introduction	21
2.2 Factors affecting quality of poultry meat: age	22
2.3 Factors affecting quality of poultry meat: genotype	24
2.4 Factors affecting quality of poultry meat: sex	29
2.5 Factors affecting quality of poultry meat: rearing conditions and production practices	29
2.6 Future trends: improving poultry quality	32

2.7	Sources of further information and advice	32
2.8	References	33
3	Husbandry techniques	38
	<i>E. T. Moran, Auburn University, USA</i>	
3.1	Introduction	38
3.2	Environmental influences on the quality of poultry meat	39
3.3	The influence of feed and nutrition on the quality of poultry meat	44
3.4	The influence of non-nutrient feed additives on the quality of poultry meat	54
3.5	Husbandry and society: animal welfare and environmental concerns	58
3.6	Sources of further information and advice	61
3.7	References	62
4	Stunning and slaughter of poultry	65
	<i>A. B. M. Raj, University of Bristol, UK</i>	
4.1	Introduction	65
4.2	Legislative and religious requirements for the slaughter of poultry	66
4.3	Electrical stunning methods	68
4.4	Gas stunning methods and the use of captive bolts	77
4.5	The effects of pre-slaughter stress and stunning methods on meat quality	81
4.6	Methods of neck cutting, dislocation and decapitation	82
4.7	Future trends: improving poultry meat quality	84
4.8	Sources of further information and advice	85
4.9	References	85
5	Primary processing of poultry	90
	<i>D. Barker, Stork PMT, UK and J. Lankhaar and P. Stals, Stork PMT, The Netherlands</i>	
5.1	Introduction	90
5.2	Live-bird supply	91
5.3	Stunning, killing, scalding and plucking	94
5.4	Evisceration and giblet harvesting	97
5.5	Chilling	99
5.6	Whole-bird selection by weight and quality	101
5.7	Whole-carcass packaging	102
5.8	Secondary chilling	102
5.9	Portioning and deboning operations.....	102
5.10	Future trends	105
5.11	References	107

6 Further processing of poultry	108
<i>D. L. Fletcher. University of Georgia. USA</i>	
6.1 Introduction: poultry consumption and the evolution of the poultry industry	108
6.2 The development of further processing: market and consumer forces and scientific research	112
6.3 Further processing methods and technologies	116
6.4 Categories of poultry products	127
6.5 The development of new poultry products	131
6.6 Future trends	132
6.7 Conclusions	133
6.8 Sources of further information and advice	134
7 Poultry packaging	135
<i>P. L. Dawson. Clemson University, Clemson, USA and C. Stephens. Cryovac Packaging Division of Sealed Air Corporation. USA</i>	
7.1 Introduction	135
7.2 Functions of packaging	136
7.3 Packaging materials	138
7.4 Packaging methods	143
7.5 Biopolymer packaging for poultry meat	155
7.6 Future trends	158
7.7 Sources of further information and advice	159
7.8 References	159
8 Poultry refrigeration	164
<i>S. James. FRPERC. UK</i>	
8.1 Introduction: the importance of refrigeration	164
8.2 The effects of refrigeration on product quality	165
8.3 The main stages in poultry refrigeration: chilling. freezing and cooling	169
8.4 The storage and transportation of chilled poultry meat	175
8.5 Sources of further information and advice	181
8.6 References	181
9 Other poultry preservation techniques	186
<i>S. Barbut. University of Guelph, Canada</i>	
9.1 Introduction	186
9.2 Preservation techniques: heating	188
9.3 Preservation techniques: drying	195
9.4 Preservation techniques: chemical treatments	196
9.5 Preservation techniques: irradiation	201
9.6 Future trends: emerging technologies	207
9.7 References	209

10 Production of turkeys, geese, ducks and game birds	211
<i>H. Remignon, Ecole Nationale Supérieure Agronomique de Toulouse, France</i>	
10.1 Introduction	211
10.2 Turkey production	212
10.3 Duck and goose production	215
10.4 The process of force-feeding palmipeds	217
10.5 Guinea fowl production	220
10.6 Japanese quail production	222
10.7 Pigeon production	224
10.8 Pheasant production	225
10.9 Future trends	227
10.10 Conclusions	229
10.11 References	229
11 Microbial hazards in poultry production and processing	232
<i>G. C. Mead, formerly Royal Veterinary College, UK</i>	
11.1 Introduction	232
11.2 Microbial hazards on the farm: <i>Salmonella</i> and <i>Campylobacter</i>	233
11.3 Feed withdrawal and transportation of live poultry	236
11.4 The effects of processing on carcass contamination	237
11.5 Microbiological testing in the processing plant	248
11.6 Future trends	249
11.7 Sources of further information	250
11.8 References	251
12 Chemical residues in poultry	258
<i>C. A. Kan, Animal Sciences Group, The Netherlands</i>	
12.1 Introduction: chemical residues	258
12.2 Safety and regulatory issues of chemical residues	259
12.3 Sources of residues in poultry meat	261
12.4 Types, levels and effects of residues in poultry meat	262
12.5 Factors affecting absorption of residues in poultry meat	277
12.6 Detection and control of residues in poultry meat	278
12.7 Future trends	279
12.8 Sources of further information and advice	280
12.9 References	280
13 Shelf-life and spoilage of poultry meat	283
<i>G. C. Mead, formerly Royal Veterinary College, UK</i>	
13.1 Introduction: shelf-life and spoilage	283
13.2 Types of bacteria and the chemical basis of poultry meat spoilage	284
13.3 Spoilage of uneviscerated poultry	287

13.4	Factors affecting the shelf-life of poultry meat	288
13.5	The effects of freezing and frozen storage	294
13.6	Food safety implications of chill storage and the isolation of spoilage organisms	294
13.7	Future trends	297
13.8	Sources of further information	298
13.9	References	298
14	Measuring quality parameters	304
	<i>E. Baéza, INRA, France</i>	
14.1	Introduction: defining quality	304
14.2	Quality parameters: carcass appearance and composition	305
14.3	Assessing the sensory quality of poultry meat: colour, texture and flavour	308
14.4	Methods of analysing the functional properties of poultry meat and final product quality	315
14.5	Assessing the nutritional quality of poultry meat	318
14.6	Conclusions and future trends	320
14.7	Sources of further information and advice	321
14.8	References	322
15	Managing the safety and quality of poultry meat	332
	<i>R. W. A. W. Mulder, Spelderholt® Poultry Consulting and Research Europe. The Netherlands</i>	
15.1	Introduction: an overview of poultry meat processing	332
15.2	The influence of technology, inspection and carcass grading on product safety and quality	334
15.3	Managing the hygiene and quality of poultry meat	336
15.4	Future trends	343
15.5	Sources of further information	344
15.6	References	344
16	Treatment and disposal of poultry processing waste	345
	<i>C. H. Burton, T. R. Cumby, D. B. Tinker. Silsoe Research Institute, UK</i>	
16.1	Introduction	345
16.2	Types of material for disposal and the environmental pollution hazards from processing plants	345
16.3	Waste management obligations and key features of current legislation	349
16.4	Sources of pollution in the broiler industry	350
16.5	Utilisation of water in processing and cleaning	352
16.6	Wate treatment strategies and techniques: primary, secondary and tertiary processes	353

16.7	Pathogen inactivation techniques: methods of decontamination	362
16.8	Disposal and utilisation of wastes and emission control	364
16.9	Waste management: selecting the right approach	366
16.10	Future trends	368
16.11	Sources of further information and advice	371
16.12	Glossary	372
16.13	References	375
<i>Index</i>		377