

## CONTENTS

1. Introduction	1
1.1 General introduction	1
1.2 Soft drinks	1
1.3 Fruit juices	10
1.4 Packaging	15
1.5 Summary	15
Further reading	15
2. Ingredients	16
2.1 Soft drinks and factors of influence	16
2.2 The constituents of a soft drink	17
2.3 Fruit juices	20
2.4 Water	23
2.5 Sweeteners	26
2.6 Acidulents	29
2.7 Flavourings	34
2.8 Colours	40
2.9 Preservatives	44
2.10 Other ingredients	49
2.11 Retrospective investigation of a soft drink	50
2.12 Food Safety	53
2.13 Future trends	54
3 Product formulation	55
3.1 Introduction	55
3.2 Identification and focus	56
3.3 Developing and proving	56
3.4 Recipe formulation for soft drinks	58
3.5 Packaging	76
3.6 Processing	77

3.7	Methodology	78
3.8	Implementation	80
3.9	Product refinement and optimisation	83
4	Processing and packaging	85
4.1	Introduction	85
4.2	Juice extraction	85
4.3	Blending	85
4.4	Processing	87
4.5	Control of Process Plant	92
4.6	Factory Layout and operation	92
4.7	HACCP	95
4.8	Good manufacturing practice	96
4.9	Cleaning in place	98
4.10	Packaging	99
4.11	Conclusion	102
5	Packaging materials	103
5.1	Introduction	103
5.2	Commercial consideration	104
5.3	Processing	106
5.4	Bottles	111
5.5	Closures	116
5.6	Cans	121
5.7	Cartons	126
5.8	Flexible pouches	131
5.9	Secondary packaging	134
5.10	Decoration	134
5.11	Environment	136
5.12	Conclusions	136
6	Shelf-life and sensory evaluation of non-alcoholic beverages	137
6.1	Introduction	137
6.2	Why set up shelf-life testing?	137
6.3	Factors affecting the shelf-life of beverages	138

6.4	Test strategies for shelf-life testing of beverages	142
6.5	Sensory methods used in the determination of shelf life	154
6.6	Consumer acceptance testing	160
6.7	Suggested strategy for shelf-life testing	160
6.8	Conclusion	164
	Further reading	164
7	Analysis of soft drinks and fruit juices	166
7.1	Introduction	166
7.2	Introduction to high performance liquid chromatography	168
7.3	Sensory evaluation	169
7.4	Water	169
7.5	Sweeteners	170
7.6	Preservatives	176
7.7	Acidulents	179
7.8	Carbonation	181
7.9	Miscellaneous additives	183
7.10	Methods used to detect juice adulteration	191
7.11	Methods used to assess the juice or fruit content of a soft drink	192
7.12	Conclusions	194
	References	194
8	Microbiology of soft drinks	197
8.1	Introduction	197
8.2	Micro-organisms	
		197
8.3	Bacteria	
		200
8.4	Moulds (filamentous microfungi)	
		201
8.5	Yeasts and yeast-like organisms	
		202
8.6	Forensic grouping and applications	
		203

8.7 Suggested Test Programme	
204	
8.8 Conclusion	
209	
Appendix 8.1 : conclusions from environmental audit inspections	
210	
Appendix 8.2	
210	
Appendix 8.3 : Simple recognition and identification of group 1	
To group 4 micro-organisms	
211 Appendix 8.4 : Media for cultivation of industrial micro-organisms	
214	
References	
215	
Further reading	
216	
9 Special topics	
217	
9.1 Complaints and enquiries	
217	
9.2 Nutrition	
221	
9.3 Soft drinks and dental damage	
227	
9.4 Ingredient specifications	
231	
9.5 Sports drinks	
233	
9.6 Niche drinks	
240	
9.7 Dispensed soft drinks and juices	
242	

References

248

Index

250