A MODEL OF CONSUMERS' PERCEPTIONS OF FOOD ADDITIVES AND CONSEQUENT PURCHASING BEHAVIOUR

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NORTH-WEST UNIVERSITY
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DEDICATED TO

My loving and supportive family – my husband, Dirk, and my children, Thinus and Laetitia

DECLARATION

I, Emmerentia Gertruida Dicks, hereby declare that:

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is my own work and that this thesis submitted for degree purposes at the North-West University has not previously been submitted for degree purposes to any other Higher Education institution and that, except for sources acknowledged, the work is entirely that of the researcher.

EG DICKS

November 2007

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TABLE OF CONTENTS

Page

List of Tables xv

List of Figures xvii

List of Annexures xviii

List of Acronyms xix

Opsomming xxi

Abstract xxiii

CHAPTER 1: INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 INTRODUCTION 1

1.2 MOTIVATION AND PROBLEM STATEMENT 1

1.3 OBJECTIVES OF THE STUDY 9

1.3.1 Primary objective 10

1.3.2 Secondary objectives 10

1.4 DEMARCATION OF THE FIELD OF STUDY 11

1.5 METHODOLOGY 11

1.5.1 Literature study 11

1.5.2 Empirical research strategy 12

1.5.3 Study population 12

1.5.4 Data collection procedures 13

1.5.5 Analysis of qualitative data 15

1.6 ASSUMPTIONS 15

1.7 OUTCOMES 16

1.8 LIMITATIONS OF THE STUDY 17

1.9 CHAPTER DIVISION 18

1.10 DEFINITIONS AND TERMINOLOGY 20

1.11 GENERAL 27

TABLE OF CONTENTS continued

Page

CHAPTER 2: KEY ISSUES OF FOOD ADDITIVES AND THE LABELLING THEREOF

2.1 INTRODUCTION 28
2.2 HISTORICAL OVERVIEW OF FOOD ADDITIVES 29
2.3 DEFINITIONS OF FOOD ADDITIVES 30
2.4 TYPES OF FOOD ADDITIVES 32
2.4.1 Incidental or accidental food additives 33
2.4.2 Indirect food additives 33
2.4.3 Intentional food additives 33
2.5 FOOD ADDITIVE CATEGORIES 34
2.5.1 Preservatives 34
2.5.2 Nutritional food additives 35
2.5.3 Flavourants 35
2.5.4 Colourants 35
2.5.5 Texturising agents 36
2.5.6 Miscellaneous food additives 36
2.6 FUNCTIONS AND USAGE OF FOOD ADDITIVES 37
2.6.1 Functions of food additives 37
2.6.2 Usage of food additives 38
2.7 BENEFITS OF FOOD ADDITIVES 39
2.7.1 Safer and more nutritious foods 39
2.7.2 Greater choice of foods 39
2.7.3 Lower-priced foods 40
2.8 RISKS OF FOOD ADDITIVES 41
2.9 BALANCING THE RISKS AND BENEFITS OF FOOD ADDITIVES 44
2.10 HYPERSENSITIVITY TOWARDS FOOD ADDITIVES 45
2.11 FOOD ADDITIVE INTAKE ASSESSMENT 47
2.12 REGULATION OF FOOD ADDITIVES 48

TABLE OF CONTENTS continued

Page

2.12.1 Authority of food additive regulation 49
2.12.2 Approval of food additives 50
2.12.3 Delaney clause 52
2.12.4 Generally recognised as safe list 52
2.12.5 Monitoring of food additive labelling 53
2.13 CONSUMER PERCEPTIONS OF FOOD ADDITIVES 55
2.13.1 Origin of erroneous food additive perceptions 56
2.13.2 Factors contributing to food additive misconceptions and confusion 57
2.13.2.1 *Conflicting messages* 58
2.13.2.2 *The rapid rate of change of knowledge* 58
2.13.2.3 *The influence of the media* 58
2.13.2.4 *The influence of self-seeking manufacturers and retailers* 59
2.13.3 Examples of food additive perceptions 59
2.13.3.1 *Monosodium glutamate* 59
2.13.3.2 *Natural compounds* 60
2.14 KEY ISSUES IN FOOD ADDITIVE LABELLING 61
2.14.1 Regulation and monitoring of food labelling 63
2.14.2 Food additive label claims 65
2.14.3 Consumer needs regarding food additive labelling 67
2.14.4 Manufacturers' needs regarding food additive labelling 68
2.14.5 Consumer perceptions of food additive labelling 69
2.14.6 Consumers' understanding of and ability to use food additive labels 69
2.15 SYNOPSIS 71

CHAPTER 3: INFLUENCE OF PERCEPTION ON DECISION-MAKING AND PURCHASING BEHAVIOUR

3.1 INTRODUCTION 74
3.2 THE PERCEPTUAL PROCESS 75

TABLE OF CONTENTS continued

		Page
3.2.1	Exposure to stimuli	76
3.2.2	Attention paid to stimuli	77
3.2.3	Interpretation of stimuli	78
3.2.3.1	*Perceptual categorisation*	80
3.2.3.2	*Perceptual inferences*	81
3.2.4	Selective perception	82
3.2.4.1	*Selective exposure*	83
3.2.4.2	*Selective attention*	83
3.2.4.3	*Selective interpretation*	84
3.2.4.4	*Functions of selective perception*	85
3.2.5	Perceptual organisation	86
3.2.5.1	*Closure principle*	86
3.2.5.2	*Similarity principle*	87
3.2.5.3	*Figure-ground principle*	87
3.3	CONSUMER INFORMATION ACQUISITION AND PROCESSING	88
3.3.1	Information acquisition	89
3.3.1.1	*Search strategies*	91
3.3.1.2	*Determinants of the amount of information search*	92
3.3.1.3	*Sources of food additive information*	95
3.3.1.4	*Limits of information acquisition*	100
3.3.2	Information processing	101
3.3.2.1	*Model of high involvement information processing*	101
3.3.2.2	*Information processing for consumer decision-making*	104
3.3.2.3	*Memory processes during information processing*	105
3.4	CONSUMER DECISION-MAKING	107
3.4.1	Complex decision-making process	108
3.4.1.1	*Problem recognition*	110
3.4.1.2	*Blocking mechanisms*	111
3.4.1.3	*Information search and processing*	111

TABLE OF CONTENTS continued

Page

3.5 OUTCOMES, INTENTIONS AND PURCHASING BEHAVIOUR 112
3.6 SYNOPSIS 113

CHAPTER 4: THE PROPOSED MODEL

4.1 INTRODUCTION 116
4.2 THE RELEVANCE OF APPLYING THE ELABORATION LIKELIHOOD MODEL TO FOOD LABELLING AND ADVERTISING 117
4.3 CONSUMERS' PERCEPTUAL PROCESS WITH REGARDS TO FOOD ADDITIVE INFORMATION 119
4.4 APPLYING THE ELABORATION LIKELIHOOD MODEL SEQUENCE TO CONSUMERS' FOOD ADDITIVE PERCEPTIONS 120
4.4.1 Exposure to food additive containing products and information 122
4.4.2 Search for food additive information 123
4.4.3 Reception of food additive information 125
4.4.4 Consumers, processing of food additive label information 126
4.4.5 The central and peripheral route of persuasion 126
4.4.6 Attention and comprehension of the food additive information stimuli 128
4.4.7 Motivation, opportunity and ability to elaborate the food additive stimuli 129
4.4.7.1 *Motivation* 130
4.4.7.2 *Opportunity* 131
4.4.7.3 *Ability* 132
4.4.7.4 *Factors affecting the consumer's motivation to elaborate on additive stimuli* ... 133
4.4.7.5 *Factors influencing the consumer's ability to elaborate on additive stimuli* 133
4.4.8 Retention of food additive information 134
4.4.9 Consumers' purchase intention 135
4.4.10 Purchasing behaviour 135
4.5 SYNOPSIS 136

TABLE OF CONTENTS continued

Page

CHAPTER 5: STUDY DESIGN AND RESEARCH METHODOLOGY

5.1 INTRODUCTION 137
5.2 THE IMPORTANCE OF CONSUMER RESEARCH 137
5.3 OBJECTIVES OF THE STUDY 139
5.4 QUALITATIVE RESEARCH STRATEGY 139
5.5 ETHICAL CONSIDERATIONS 140
5.6 SAMPLING STRATEGY 142
5.6.1 Defining the target population 144
5.6.2 Sampling procedure 144
5.6.3 Selection criteria and sample size 145
5.6.3.1 *Selection criteria* 145
5.6.3.2 *Number of participants in focus groups* 146
5.6.3.3 *Number of focus groups* 148
5.7 FRAMEWORK FOR FOCUS GROUP RESEARCH 149
5.8 THE PILOT STUDY 152
5.9 DATA COLLECTION PROCEDURES OF THE MAIN STUDY 153
5.9.1 Recruitment procedure 153
5.9.1.1 *Access to participants* 154
5.9.1.2 *Screening procedure* 154
5.9.2 Strategies to enhance attendance 155
5.9.3 Dates and facilities for data gathering 156
5.9.4 Scenarios and vignette 156
5.9.5 Focus group discussions 157
5.9.5.1 *Development of focus group question guides* 158
5.9.5.2 *Setting for data gathering* 160
5.9.5.3 *Moderating focus groups* 160
5.9.5.4 *Debriefing of participants* 162
5.9.5.5 *Debriefing of focus group sessions* 162

TABLE OF CONTENTS continued

Page

5.10 DATA ANALYSIS 163
5.10.1 Qualitative content analysis 166
5.10.1.1 *Transcription of data* 166
5.10.1.2 *Coding of the data* 167
5.10.1.3 *Categorising the data* 169
5.10.1.4 *Identification of themes* 170
5.11 STRATEGIES USED TO ENSURE TRUSTWORTHINESS 172
5.12 SYNOPSIS 176

CHAPTER 6: DATA ANALYSIS, RESULTS AND DISCUSSION OF RESEARCH FINDINGS

6.1 INTRODUCTION 178
6.2 RESULTS OF THE PILOT STUDY 179
6.3 RESULTS OF THE MAIN STUDY 180
6.3.1 Unprompted awareness 180
6.3.1.1 *Results of participants' ability to list food additive names question* 181
6.3.1.2 *Results of food products containing additives question* 182
6.3.1.3 *Results of knowledge about food additive claim question* 182
6.3.1.4 *Discussion of unprompted awareness questions* 184
6.3.2 Prompted awareness 185
6.3.2.1 *Results of prompted awareness scenario* 185
6.3.2.2 *Discussion of prompted awareness scenario questions* 188
6.3.3 Focus group discussions 189
6.3.3.1 *Participants' general perceptions about food additives* 190
6.3.3.1.1 *Theme 1: Addition of chemical substances to food products* 190
6.3.3.1.2 *Theme 2: Specific benefits of food additive applications* 191
6.3.3.1.3 *Theme 3: Risks of food additive consumption* 194
6.3.3.1.4 *Theme 4: Situational factors influencing food additive utilisation* 196

TABLE OF CONTENTS continued

Page

6.3.3.2 *Participants' perceptions of manufacturers' use of food additives* 199
6.3.3.2.1 *Theme 1: Consumer benefits* 200
6.3.3.2.2 *Theme 2: Unethical motivations from manufacturers* 201
6.3.3.2.3 *Theme 3: Marketing strategy* 202
6.3.3.2.4 *Theme 4: Consumers' uncertainty* 204
6.3.3.3 *Participants' awareness and perceptions of E-numbers* 205
6.3.3.3.1 *Theme 1: Participants' knowledge of E-numbers* 205
6.3.3.3.2 *Theme 2: Influence of perception of E-numbers on purchasing behaviour* 210
6.3.3.4 *Participants concern and coping strategies with food additives* 211
6.3.3.4.1 *Theme 1: Participants' concerns about food additive* 211
6.3.3.4.2 *Theme 2: Participants' coping strategies to reduce concerns* 221
6.3.3.5 *Participants' perceptions of food additive risks* 223
6.3.3.6 *The influence of risk perception on participants' purchasing behaviour* 226
6.3.3.7 *Participants perceptions' about the safety of food additives* 229
6.3.3.8 *Participants perceptions' about food additive legislation in South Africa* 231
6.3.3.9 *Participants perceptions' of information sources* 234
6.3.3.9.1 *Theme 1: Information sources about additives on an impersonal level* 234
6.3.3.9.2 *Theme 2: Information sources about food additives on a personal level* 236
6.3.3.9.3 *Theme 3: Trustworthiness of food additive information sources* 238
6.3.3.9.4 *Theme 4: Role (persuasiveness) of food additive information sources* 240
6.3.3.9.5 *Theme 5: Quality of food additive information sources* 241
6.3.3.9.6 *Theme 6: Participants' integration of food additive information in practice* 242
6.3.3.10 *Influence of information sources on purchasing behaviour* 243
6.3.3.11 *Participants' perceptions about food additive labelling* 245
6.3.3.11.1 *Theme 1: Participants' perception of food additive label information* 245
6.3.3.11.2 *Theme 2: Non label reading activities of participants* 249
6.3.3.11.3 *Theme 3: Type of additive information searched on labels* 250
6.3.3.12 *Participants' perception of ingredient lists on food products* 251
6.3.3.13 *Participants' approval of current label dissemination* 257

TABLE OF CONTENTS continued

Page

6.3.3.13.1 *Theme 1: Participants' satisfaction with manufacturers' dissemination of food additive information* 257

6.3.3.13.2 *Theme 2: Participants' dissatisfaction with manufacturers' dissemination of food additive information* 258

6.3.3.14 *Participants' perceptions of a food additive claim* 260

6.3.3.14.1 *Theme 1: Participants' awareness of the term "Food additive claim"* 261

6.3.3.14.2 *Theme 2: Examples of food additive claims as perceived by participants* 263

6.3.3.14.3 *Theme 3: Participants' beliefs about food additive claims* 263

6.3.3.15 *Influence of food additive claims on participants' purchasing behaviour* 268

6.4 SYNOPSIS 270

CHAPTER 7: A MODEL OF CONSUMERS' PERCEPTIONS OF FOOD ADDITIVES AND CONSEQUENT PURCHASING BEHAVIOUR

7.1 INTRODUCTION 275

7.2 A MODEL OF CONSUMERS' PERCEPTIONS OF FOOD ADDITIVES AND CONSEQUENT PURCHASING BEHAVIOUR: APPLYING THE ELABORATION LIKELIHOOD MODEL 276

7.2.1 Exposure to persuasive communication and problem recognition about food additives 278

7.2.2 Blocking mechanisms in food additive decision-making 279

7.2.3 Information search 280

7.2.4 Reception of food claims and ingredient list 281

7.2.4.1 *Claims* 281

7.2.4.2 *Ingredient list* 282

7.2.5 Coping or risk reduction strategies 283

7.2.6 Consumers' perception and the perceptual filter regarding food additives 284

7.2.7 Food additive stimuli or information processing 285

7.2.7.1 *Motivation of food additive label reading consumers* 286

TABLE OF CONTENTS continued

Page

7.2.7.2 *Consumers' opportunity to process food additive information* 287
7.2.7.3 *Food additive label reading: consumers' ability to elaborate information* 287
7.2.8 Consumers' retention of initial perceptions 288
7.2.9 Consumers' food additive purchasing behaviour 289
7.2.9.1 *Purchasing behaviour through the central route to persuasion* 289
7.2.9.2 *Purchasing behaviour through the peripheral route to persuasion* 290
7.3 SYNOPSIS 290

CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION 292
8.2 FINDINGS OF THE STUDY 294
8.3 CONCLUSIONS 295
8.4 RECOMMENDATIONS 297
8.4.1 Practical implications of the results for consumers 297
8.4.2 The field of education 298
8.4.3 The field of legislation 298
8.4.4 The field of food marketing 300
8.4.5 Further research 302

LIST OF REFERENCES 303

ANNEXURES 337

LIST OF TABLES

Page

Table 2.1 Regularly check labels for contents: global and South African averages 67
Table 3.1 Components of perceived risk associated with food additive safety 94
Table 3.2 External sources of consumer information 97
Table 3.3 A comparison of information sources 100
Table 4.1 Motivation, ability and opportunity to process information 130
Table 5.1 Suggested format for an information sheet 141
Table 5.2 Framework for focus group research 151
Table 5.3 Summary of focus group sessions, dates and venues 155
Table 5.4 Strategies applied to ensure trustworthiness 174
Table 6.1 Participants' understanding of the concept food additive claim 183
Table 6.2 Techniques and reasons used for selecting orange juice 1 186
Table 6.3 Techniques and reasons used for selecting orange juice 2 186
Table 6.4 Techniques and reasons used for selecting orange juice 3 187
Table 6.5 Techniques and reasons used for selecting orange juice 4 188
Table 6.6 Theme 1: Addition of chemical substances to food products 191
Table 6.7 Theme 2: Specific benefits of food additive applications 192
Table 6.8 Theme 3: Risks of food additive consumption 195
Table 6.9 Theme 4: Situational factors influencing food additive utilisation 197
Table 6.10 Theme 1: Consumer benefits 200
Table 6.11 Theme 2: Unethical motivations from manufacturers 201
Table 6.12 Theme 3: Marketing strategy 203
Table 6.13 Theme 4: Consumers' uncertainty 204
Table 6.14 Theme 1: Participants' knowledge of E-numbers 206
Table 6.15 Theme 2: Influence of E-numbers perception on purchasing behaviour 210
Table 6.16 Theme 1: Participants' concerns about food additive 212
Table 6.17 Theme 2: Participants' coping strategies to reduce concerns 222
Table 6.18 Theme: Participants' perception about food additive risks 224
Table 6.19 Theme: Influence of food additive risk perception purchasing behaviour 227
Table 6.20 Theme: Participants' perception about food additive safety 230

LIST OF TABLES continued

Page

Table 6.21 Theme: Consumer knowledge about food additive legislation 232
Table 6.22 Theme 1: Information sources about additives on an impersonal level 235
Table 6.23 Theme 2: Information sources about food additives on a personal level 237
Table 6.24 Theme 3: Trustworthiness of food additive information sources 238
Table 6.25 Theme 4: Role of food additive information sources 240
Table 6.26 Theme 5: Quality of food additive information sources 241
Table 6.27 Theme 6: Participants' integration of food additive information in practice 242
Table 6.28 Theme: Influence of food additive information on purchasing decision 244
Table 6.29 Theme 1: Participants' perception of food additive label information 246
Table 6.30 Theme 2: Non-label reading activities of participants 249
Table 6.31 Theme 3: Type of additive information searched on labels 251
Table 6.32 Theme: Participants' perception of the ingredient list 252
Table 6.33 Theme 1: Satisfaction with dissemination of additive information 257
Table 6.34 Theme 2: Dissatisfaction with dissemination of additive information 258
Table 6.35 Theme 1: Participants' perceptions of the term "Food additive claim" 262
Table 6.36 Theme 2: Examples of food additive claims as perceived by participants 263
Table 6.37 Theme 3: Participants' beliefs about food additive claims 264
Table 6.38 Theme: The influence of additive claims on purchasing behaviour 269

LIST OF FIGURES

Page

Figure 1.1 Applying the Elaboration Likelihood Model sequence to consumer attitude change 8
Figure 3.1 An overview of the perceptual process 76
Figure 3.2 Role of information acquisition in consumer decision-making 90
Figure 3.3 Information sources for a purchase decision 96
Figure 3.4 A model of high involvement information processing 103
Figure 3.5 Information processing for consumer decision-making 105
Figure 3.6 Stages in the process of complex decision–making 109
Figure 4.1 Applying the Elaboration Likelihood Model sequence to consumers' food additive perceptions 121
Figure 5.1 From data to text 164
Figure 5.2 Coding from text 168
Figure 5.3 From codes to categories in qualitative content analysis 170
Figure 5.4 Moving "backwards" through the data working process: the process of tracking the rationalising of the data 171
Figure 7.1 A model of consumers' perceptions of food additives and consequent purchasing behaviour 277

LIST OF ANNEXURE

		Page
Annexure A	Petty and Cacioppo's Elaboration Likelihood Model	337
Annexure B	Ethical approval	338
Annexure C	Managers Information Letter	339
Annexure D	Preschool Information Letter	341
Annexure E	Informed Consent	343
Annexure F	Screening Questionnaire	346
Annexure G	Unprompted Awareness Scenario	348
Annexure H	Prompted Awareness Scenario	349
Annexure I	Focus Group Guide: Main Study	350
Annexure J	Pilot study guide	354
Annexure K	Literature Analysis of Ingredient Lists for Prompted Awareness	357

LIST OF ACRONYMS

ADD	Attention Deficit Disorder
ADHD	Attention Deficit Hyperactivity Disorder
ADHASA	Attention Deficit Hyperactivity Association of SA
ADI	Acceptable Daily Intake
ADSA	Association for Dietetics in Southern Africa
BHA	Butylated Hydroxyanisole
BHT	Butylated Hydroxytoluene
CCFL	Committee on Food Labelling
CGCSA	Consumer Goods Council of SA
DOH	Department of Health
EC	European Community
ELM	Elaboration Likelihood Model
EU	European Union
EUFIC	European Union Food Information Council
FAC	Food Advisory Committee
FACS	Food Advisory Consumer Service
FAO	Food and Agriculture Organisation
FD&C Act	Federal Food, Drug and Cosmetic Act
FC&D Act	Foodstuffs, Cosmetic and Disinfectants Act
FDA	Food and Drug Administration
FLAG	Food Legislation Advisory Group
FMCG	Fast Moving Consumer Goods
FMI	Food Marketing Institute
FSA	Food Standards Authority
FSANZ	Food Standards Australia New Zealand
FSIS	Food Safety and Inspection Service
GACSA	Glutamate Advisory Council of South Africa
GM	Genetically Modified
GMA	Grocery Manufacturer's Association

GMP	Good Manufacturing Practices
GRAS	Generally Recognised as Safe
IFIC	International Food Information Council
IFT	Institute of Food Technologists
INS	International Numbering System
JECFA	FAO/WHO Joint Expert Committee on Food Additives
KWV	Koöperatiewe Wijnbouwers-Vereniging
LFI	Leatherhead Food International
MAFF	Ministry of Agriculture, Fisheries and Food
MOA	Motivation, Opportunity and Ability
MSG	Monosodium glutamate
NSSA	Nutrition Society of South Africa
NCC	National Consumer Council
NGO	Non Government Organisation
NLEA	Nutrition Labelling and Education Act
NRC	National Research Council
rDNA	Recombinant Deoxyribonucleic Acid
SA	South Africa
SAAFFI	South African Association of the Flavour and Fragrance Industry
SAAFoST	South African Association of Food Science and Technology
SABS	South African Bureau of Standards
SCF	Scientific Committee on Food in the EU
SMEs	Small and Medium Enterprises
UK	United Kingdom
USA	United States of America
WHO	World Health Organisation
WTO	World Trade Organisation

OPSOMMING

Die primêre doel van die studie was om die Uitgebreide Waarskynlikheidsmodel van oorredende kommunikasie op verbruikers se persepsies van voedseladditiewe toe te pas. Die model illustreer hoe die verbruiker inligting oor voedseladditiewe op etikette verwerk, wat weer op sy beurt die verbruiker se besluitnemings- en aankoopgedrag beïnvloed. Tot op datum is min navorsing nog gedoen wat verbruikers se persepsies, sieninge, begrip en aankoopgedrag met betrekking tot voedseladditiewe verduidelik. Die verskerpte bemarking van voedsels wat additiewe bevat, tesame met die verbruiker se kommer oor die risiko's wat voedseladditiewe inhou, het die behoefte laat ontstaan vir teoreties gefundeerde navorsing. Daar is tans 'n tekort aan sodanige inligting in Suid-Afrika.

'n Fenomenologiese kwalitatiewe beskrywende navorsingstrategie is gebruik. Die studie het bestaan uit 39 verbruikers wat aan agt verskillende fokusgroepsessies deelgeneem het. Al die deelnemers was afkomstig van die Vanderbijlpark-Vereeniging-gebied. Inhoudsontleding is gedoen om die inligting voortspruitend uit die fokusgroepbesprekings te kategoriseer en in temas op te som. Drie-en-dertig verskillende temas is geïdentifiseer.

In hooftrekke is daar bevind dat die verbruiker voedseladditiewe beskou as onnatuurlike chemiese stowwe wat by voedsel gevoeg word en wat beide voor- en nadele vir die verbruiker inhou. Daar is ook bevind dat elke individuele verbruiker se spesifieke omstandighede die gebruik van additief-inligting op etikette beïnvloed. Tartrasien, MSG en aspartaam was die additiewe waarvan die verbruikers die meeste bewus was in vergelyking met enige ander additiewe.

Die deelnemers is met verskeie blokkeringsmeganismes gekonfronteer. Van die blokkeringsmeganismes sluit in 'n gebrek aan gestandaardiseerde terme, onleesbare etikette, 'n gebrek aan voedselregulering en kontrolering, inligtingoorlading, onverstaanbare inligting, oneerlikheid aan die kant van vervaardigers, tydsbeperkinge en te min, verkeerde en onbetroubare inligting. Daarteenoor gebruik die verbruiker verskeie hanterings- of risikoverminderingsmeganismes om die risiko's wat voedseladditiewe inhou te verlaag.

Die aanpassing en toepassing van die Uitgebreide Waarskynlikheidsmodel van oorredende kommunikasie het die navorser gehelp om die resultate van die studie van verbruikers se persepsies en gedrag ten opsigte van voedseladditiewe soos aangedui op voedseletikette beter te interpreteer. Die aangepaste model illustreer hoe verbruikers se persepsies van voedseladditiewe en die etikettering daarvan, asook 'n verdere soeke na inligting, hul aankoopgedrag in verskillende mates kan beïnvloed. Daar word aanbeveel dat meer aandag aan verbruikersopleiding oor terminologie ten opsigte van additiewe op etikette gegee moet word. Die etiketteringsregulasies word tans hersien en die bevindinge van hierdie studie kan gebruik word om nuttige aanbevelings aan die Departement van Gesondheid te maak. Verder kan bemarkers en handelaars die resultate gebruik om hulle verbruikers se gedrag ten opsigte van additief-etikettering beter te verstaan. Die waarde van die studie was om aan te dui dat verbruikers se persepsies rakende voedseladditiewe 'n belangrike faktor in hulle aankoopgedrag is.

Sleutelwoorde: Aankoopgedrag, additiewe, persepsie, Uitgebreide Waarskynlikheidsmodel van oorredende kommunikasie, verbruikersgedrag, voedseletikettering

ABSTRACT

The primary objective of this study was to apply the Elaboration Likelihood Model of persuasive communication to consumers' perceptions of food additive labelling. The model was used to explain how consumer information processing influences consumers' decision-making and consequent purchasing behaviour with regard to food products that contain food additives. To date, few studies have explained consumers' perceptions, viewpoints and understanding of additive labelling, or of their related purchasing behaviour. However, the increased marketing of processed foods containing additives and the concern expressed by consumers regarding the risks of additives call for the development of a theoretical basis for research into these issues. There is currently a lack of such data in South Africa.

This study was conducted from a phenomenological qualitative approach with a descriptive exploratory nature. Eight focus group sessions with 39 food additive label readers were held in the Vanderbijlpark-Vereeniging area. A content analysis of the focus group discussions resulted in the categorising of concepts, and 33 subtle underlying themes were identified.

The main findings of the study were that the participants' general perceptions suggested that food additives can be defined as unnatural chemical substances that are added to food and that hold some benefits and/or risks to the consumer. The participants' use of food additive information was influenced by the situational factors associated with each individual participant. Moreover, the participants were more aware of tartrazine, MSG and aspartame than of any other food additive.

Participants were also confronted with various blocking mechanisms when searching for and selecting food products containing additives. These included a lack of standardisation of terminology, illegible ingredient listing, a lack of food control and regulation, information overload, incomprehensible information, manufacturers' dishonesty, time constraints and incorrect, untrustworthy, insufficient information. On the other hand, participants used various coping or risk-reducing strategies to reduce their concerns.

In order to interpret the results, the Elaboration Likelihood Model of persuasive communication was adapted and applied to food additive labels. The adapted model illustrates how the consumers' perceptions of additive labels and their search for additional information influence their purchasing behaviour to varying extents. It is recommended that more attention be given to consumer education with regard to additive-related terminology used on food labels and that the results be put to use in the current revision of labelling regulations. Marketers and retailers could use the information to better understand the behaviour of consumers who read food additive labels. The value of this study was to show that consumers' prior perceptions of food additives are an important determinant of their purchasing behaviour.

Keywords: Consumer behaviour; Elaboration Likelihood Model of persuasive communication; food additives; food labelling; perception; purchasing behaviour

CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE STUDY

1.1 INTRODUCTION

Technological advancement has created many novel innovations in the food industry. Food is now being genetically manipulated and irradiated, whilst some manufacturers use chemicals or additives and improved methods of cooking in food processing. The primary objective of the food industry is to persuade consumers to purchase their products, with the drive for profit maximisation (Bennion, 1980:120; Kajanne & Pirttilä-Backman, 1996:218; Jukes, 2000:4; Hollingsworth, 2002:25; Salminen & Tahvonen, 2002:11).

Despite their modern-day associations, food additives have been used for centuries. Currently, all food additives fall under the purview of the Food and Drug Administration (FDA) (Weigley *et al.*, 1997:27-28; Hutt, 2002:210). The landmark act titled "Pure Food Law of 1906" was the first federal law related to food additives which was implemented in the United States of America (USA) (Burdock & Carabin, 2004:4; EUFIC, 2004a:1). In 1958 the food additives amendment to the Federal Food and Drug and Cosmetic act was passed specifying that no substance may be added to food if it induces cancer (McWilliams, 2005:549). The pertinent question, therefore, was whether the consumer benefits in any way from food additives and whether the consumer actually understands the types and uses of food additives.

1.2 MOTIVATION AND PROBLEM STATEMENT

Worldwide food additives are still one of the most misunderstood concepts in food processing (Bruhn, 2002:101; EUFIC, 2004a:1; McWilliams, 2005:547). Sloan *et al.* (1986:532) found that the concern about additives was related to a general fear of chemicals such as chemical spills and diseases, like cancer. Consumers' fear concerning food additives often results from a lack of knowledge and trust concerning the true process of food additive approval and regulatory procedures (Kajanne & Pirttilä-Backman, 1996:207). Consumers reading the

ingredient labels on many processed and prepared foods in the market today seem to have developed a wide range of emotions and perceptions, ranging from embarrassment at not being able to pronounce the tongue-twisting chemical names, to utter panic about the perceived hazards of the "unnatural chemical feast" that greets the consumer in the store (McWilliams, 2005:548). Currently there is public debate concerning food additive usage, including food safety, the health risks associated with food additives and the wholesomeness of food in general. Informed scientists, food producers and legal authorities need to develop strategies for addressing concerns regarding food additive use. As the demand for a variety of convenience foods increases, more additives will be used in future. Simultaneously, as consumers become better educated, they may also want a smaller risk associated with the food they consume (Branen & Haggerty, 2002:9; Williams *et al.*, 2004:37).

A British as well as a German survey concluded that food additives were of main concern to consumers (MAFF, 1986:62; Przyrembel, 2004:361). According to Wandel (1997:218), consumers argued that food products like bread containing food additives will be made to last very long. These consumers perceived that it could increase the probability of getting an old product, in other words, it is not freshly baked. Consumers believe that the chemicals or additives that manufacturers add to the food make the food unrecognisable. Seventy five percent of the consumers wanted to know more about food additives, while 30% thought that avoiding additives is important for a healthy diet. Unfortunately this study did not indicate the reasons why consumers want more information on food additives (Wandel, 1997:218). Furthermore, consumers thought that manufacturers were trying to disguise food additives (Bruhn, 2002:103). This shows that the concern about food additives is only partly grounded on health considerations. A lack of knowledge may help to explain the discrepancy between concern over food additives and purchasing behaviour (Davies & Wright, 1994:60). Despite consumers' perceived concern about the unhealthiness of food additives, Davies and Wright (1994:61) and Tansey and Worsley (1995:154) found that almost half of the consumers were unable to give a single example of a food additive. Similarly Bruhn (2002:103) indicated that only 39% of consumers were able to identify a food additive correctly. The question thus remains as to what consumers understand about food additives.

All ingredients and additives contained in food are identified and listed on the label in a descending order of weight (Proudlove, 1990:1; Schmidt, 2000:88; SA, 2007:9). An additive must be listed by the principle function it serves, followed by its name and/ or serial or E-number as in the case of the European Community (EC). Such labelling is mandatory in South Africa (SA) (SA, 2007:10), USA (Baker *et al.*, 1988:178), in the European Union (EU) (Przyrembel, 2004:363) and many other countries throughout the world. In spite of these regulations, paradoxically some consumers consider E-numbers detrimental to health and will probably avoid them. This is a reflection of consumer confusion over the regulatory process due to the adverse publicity E-numbers have received (Proudlove, 1990:1, Davies & Wright, 1994:62; Bruhn, 2002:103). The question could be asked which consumer would know or have the facilities to investigate the mystery of, for example E471, in order to discover that it is the emulsifier used or what the numerous E-numbers represent in the products they were buying. Thus terminology can influence consumer acceptability of food products. Moreover, the literature review indicates that it is uncertain what role additive coding plays in the decision-making process involved during food purchasing (Davies & Wright, 1994:62; Worsley, 1994:225; Wandel, 1997:214; Wright, 1997:420; Nancarrow *et al.*, 1998:113).

Consumers' food allergies may trigger other concerns about food additives. The Food Advisory Committee (FAC) reported that the prevalence of adverse reactions to food and food ingredients is 1.4% -1.8%, with most being reactions to natural foods rather than to synthetic additives and contaminants, at a prevalence rate of about 0.3% (FAC, 2002:1). Despite this, Australian as well as United Kingdom (UK) consumers give the main reason for looking for food additives on the food label as allergies (Young, 1997:113; Bruhn, 2002:102; Williams *et al.*, 2004:37). Various the factors are employed by regulators and manufacturers to ensure minimum human sensitivity to the food additives. Even with these factors in place particular segments of the population are susceptible to additives associated with clinical disorders or toxic responses (Young, 1997:113).

Consumer response towards food additives can also be related to perceived quality (Bruhn, 2002:102). More than 75% of consumers indicated that artificial flavourants affect the taste of food negatively compared to natural flavourants (Zibrik *et al.*, 1981:49; McNutt *et al.*, 1986:76). Young (1997:113) indicated that the public perception that all that is natural is

"good" and artificial is "bad" undoubtedly exists in the UK. Thus, consumer's reaction to the inclusion of artificial or synthetic additives may be more emotional than rational (Wright, 1997:420; Bruhn, 2002:102). Consumers appear to be unaware of the potential benefits of additives. Additives are an important part of food production, since they can preserve nutritional quality, prolong durability and improve the taste and texture of food products. More than 80% of Canadian consumers thought that food colourants are unnecessary and believed it makes food less safe. USA certified additives were more acceptable, while artificial colourants were least acceptable (Bruhn, 2002:102; McWilliams, 2005:551). Likewise, 71% of Finish people agreed that "natural foods" are always better for one than processed foods. Pressure groups are convinced that food and drinks contain additives which are bad for one's health (Kajanne & Pirttilä-Backman, 1996:208).

The media often has a large impact on consumer behaviour (Jukes, 2000:2; Hollingsworth, 2002:25; Williams *et al.*, 2004:35) and serve as an important source of consumer information (Tansey & Worsley, 1995:154, 179; Antonides & Van Raaij, 1998:387). Shine *et al.* (1997a:284) identified the communication channels through which consumers obtained information. These are (in descending order of importance) the "popular" media, family and friends and lastly, the doctor or dietitian. In the context of food and nutrition, the "popular" media are undoubtedly one of the most powerful sources because they quite often succeed in influencing their audiences (Marks, 1993:8). Unfortunately, misinformation is a prevailing problem with such media attention, whilst food fright is a natural attention grabber which can result in confusion (Prättälä *et al.*, 1985:240; Shine *et al.*, 1997a:284; Young, 1997:113; Schafer *et al.*, 1993:140; Kajanne & Pirttilä-Backman, 1996:208; Williams *et al.*, 2004:32). The following incidents with particular reference to SA, indicate how the popular media convey more hype than hard facts, which are supported by "experts" writing newspaper articles:

- In the Burger (February 15, 2002), Swanepoel (2002:9) reported on the death of a boy aged 17. He died of an asthma attack after drinking cool drink which probably contained tartrazine. The report claims that SA has good food laws and regulations in place, however, the application thereof is poor.
- "NGO calls for health warnings on food" in the Natal Witness on December 12, 2002 (Anon., 2002:6). The article focused on foodstuffs containing potentially toxic

chemicals, including additives such as tartrazine, monosodium glutamate (MSG), aspartame, saccharin, sulfites and nitrates. It claims that these substances are freely added to SA foods, although the use thereof is either banned or restricted in other countries.

- "Wet gevra teen 'gif' in SA kos" in the Burger of October 9, 2002 (Bonthuys, 2002:3). This article claims that South Africans are slowly poisoned by chemicals used in concentrated cool drinks, sweets and processed meat.
- "Additives leave kids allergic to real food" in the Star on January 23, 2003 (Poulter, 2003:16). The article claimed that children are consuming so many additives that their systems cannot cope with natural "whole foods" such as milk, eggs, flour and nuts, leading to food intolerance and a range of other symptoms.
- Sensational headings were used by reporters to reveal the use of flavourants in wine. These includes headings such as: "Additives scandal hits KWV" (Brand, 2004:9); "Wine board embargoes cellar for use of additives" (Smetherham, 2004:3) and "Clampdown on use of illegal wine additives" (Carew, 2003:5).
- "Soeter, rooier, langer op die rak... maar is dit gesond? In the "Perspektief" of April, 23, 2006 (Tancred, 2006:3). Although this article gave a more balanced view about additives by dietitians and a representative from the directorate food control, some comments were the biased opinion of a well known organic farmer.

The claims made by the media immediately grab the attention of the consumer. However, these claims are reminiscent of quick opinions that lack truth in knowledge with regard to the effect of food additives. The Internet is another source replete with allegations of health threats (Tansey & Worsley, 1995:154; Hollingsworth, 2002:25; Williams *et al.*, 2004:32). One example of this is the Nancy Markle letter claiming that aspartame is connected to 92 documented medical symptoms from coma to death (Hollingsworth, 2002:25).

The food label is another important transmitter of information in the consumer's decision-making process and consequent purchasing behaviour (Feick *et al.*, 1986:173; Wright, 1997:421; Hunt, 2000:16; Williams *et al.*, 2004:36). Information on the food label should be formulated in such a way that consumers can understand and use it. A Norwegian study found that female consumers focus more on additives than fat content when reading the labels

(Wandel, 1997:212). Similar trends have been reported in New Zealand by Worsley (1996:77). Federal mandates include disclosure of ingredients in all products, as well as the identification and declaration of artificial colourants, artificial flavourants and chemical preservatives that have more than one ingredient. The risks and benefits of food additives and ingredients must be clearly displayed to consumers (Sumner & Eifert, 2002:27). Such labelling is mandatory in SA (Mermelstein, 1993:68; Woodburn & Raab, 1993:97; SA, 2007:10). Given the large amount of literature that has been devoted to consumer's perception of food labels, it is rather surprising that research determining consumer's comprehension and perceptions on additive label information, does not appear in large numbers of investigations. Abbott (1997:47) indicated that one interesting area in need of further research is how information about supposed activities of food components, which cannot be claimed formally on a label, is obtained, interpreted and translated into purchasing behaviour. It is, therefore, questioned what the consumers' reactions are towards such statements published by the popular media and whether this information, as well as the information on the food label, play some role in consumer perceptions of food additives and hence influence the consequent purchasing decisions of foods.

It is understood that consumers seek and use information from internal and external sources as part of their rational problem-solving (Cant *et al.*, 2006:197) and decision-making process (Assael, 1995:225; Antonides & Van Raaij, 1998:249; Sheth *et al.*, 1999:554; Hanna & Wozniak, 2001:294; Hoyer & MacInnis, 2001:17; Rousseau, 2003a:118; Solomon, 2004:297; Hawkins *et al.*, 2004:578; Peter & Olson, 2008:51; Schiffman & Kanuk, 2004:556). Consumers make decisions based on what they perceive (Assael, 1995:225; Sheth *et al.*, 1999:554, Cant *et al.*, 2006:193). Hawkins *et al.* (2004:27) describe perception an internal influence that affects product selection in the purchase situation. The perceptual process is concerned with how the information from the external sources is registered and coded by the consumer (Sheth *et al.*, 1999:553). More specifically, perception is the gateway in which information of stimuli is gathered, sorted out, interpreted and analysed through senses about the world into a meaningful and coherent picture.

Perception constitutes three stages, namely: exposure, attention and interpretation (Matlin, 1983:2, 6; Feldman, 1996:101; Hanna & Wozniak, 2001:102; Hawkins *et al.*, 2004:278;

Schiffman & Kanuk, 2004:168). In addition to the three stages, Cant *et al.* (2006:120) add a fourth stage. They indicated that recall or memory is the last stage of information processing. Moreover, one of the most important functions of perception is to provide consumers with information (Jordaan *et al.,* 1975:315; Hanna & Wozniak, 2001:113). Hence, information processing can be defined as a series of activities by which stimuli are perceived, transformed and stored (Assael, 1995:89; Feldman, 1996:684). This also implies that purchasing behaviour is largely determined by how consumers think about and process information (Foxall *et al.*, 2002:28).

The final or fourth stage of information processing is referred to as elaboration by Foxall *et al.* (2002:83). Elaboration is the creation of complex networks of ideas and emotions about products within the memory based upon the messages transmitted to consumers (Foxall *et al.,* 2002:83; Hoyer & MacInnis, 2001:183). In other words, elaboration refers to the amount of integration between the new information and existing knowledge stored in the memory or the number of personal connections made between the stimulus and one's life experiences and goals (Engel *et al.,* 1993:405; Hanna & Wozniak, 2001:201). The consumer, therefore, elaborates upon the message received to examine and interpret it (Sheth *et al.,* 1999:407). Petty and Cacioppo (1986:3) developed the Elaboration Likelihood Model (ELM) of persuasive communication which deals explicitly with exposure to persuasive communications.

The ELM provides a useful approach to understanding how consumers evaluate messages received, such as the ingredients list or additives used in products and the main processes underlying persuasion (Petty & Cacioppo, 1984:672; Sheth *et al.*, 1999:407). In short the ELM illustrates how consumers process information (Engel *et al.,* 1993:405; Assael, 1995:161). Consumers process information in either the central or the peripheral route of persuasion (Petty & Cacioppo, 1986:21; Sheth *et al.*, 1999:207-408; Solomon, 2004:282). The central route to persuasion requires more elaboration whilst the peripheral route to persuasion requires less elaboration (Hanna & Wozniak, 2001:201). The degree of message elaboration depends on the relevance of the message to the consumer (Petty & Cacioppo, 1986:81; Assael, 1995:161; Peter & Olson, 2008:438). Elaboration is influenced by both ability and motivation during message processing (Petty & Cacioppo, 1986:8). In addition to motivation

and ability, Antonides and Van Raaij (1998:208) describe a third factor, namely opportunity that can influence elaboration likelihood. It should, therefore, be of prime importance for a consumer to understand food additives correctly in order to make purchasing decisions using the information on the ingredient list of a label. In addition, consumers should be motivated to search for information of personal relevance and they must have the opportunity such as time available to do so (Antonides & Van Raaij, 1998:208-210). Although many of the experiments supporting the ELM have been applied to advertising messages, it is suggested by Davies and Wright (1994:57) that it can be extended to the provision of other forms of marketing information such as food labels.

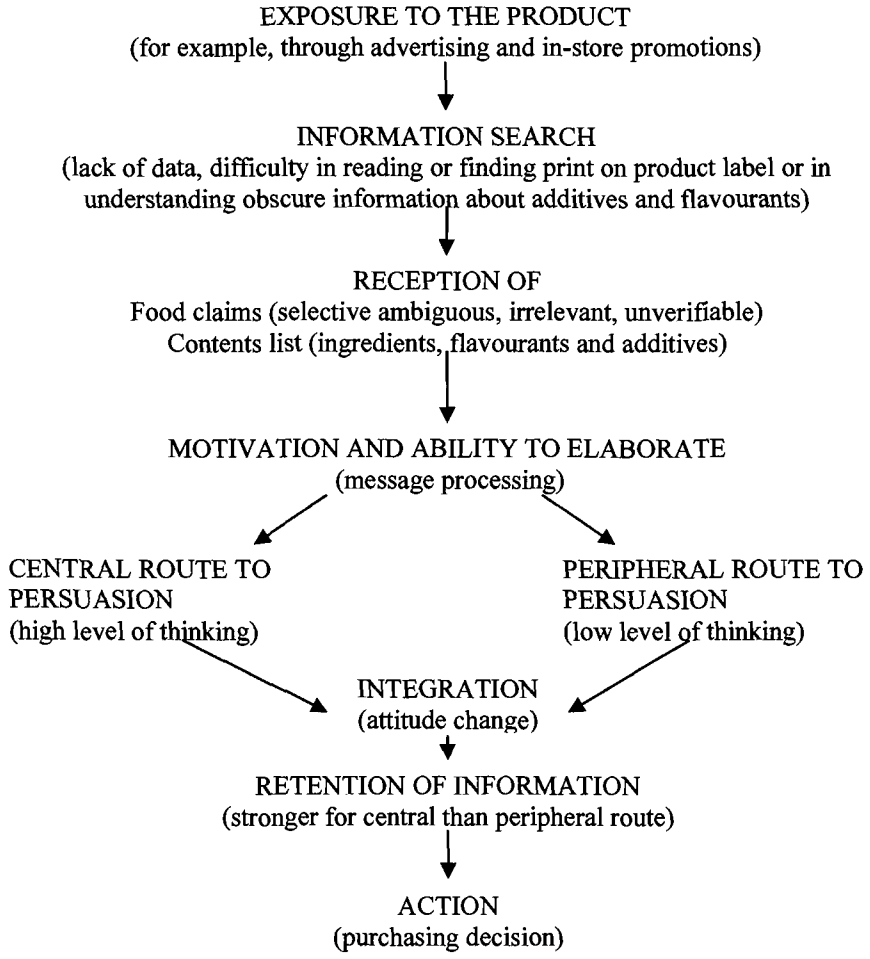


Figure 1.1 Applying the Elaboration Likelihood Model sequence to consumer attitude change (Wright, 1997:425)

The ELM of persuasion (Petty & Cacioppo, 1984:672; Antonides & Van Raaij, 1998:208) is, therefore, a model that can be used to investigate the way perceived information of food additives is processed. A diagrammatical representation of the consumer's decision-making process by the adapted ELM for food labelling is shown in Figure 1.1 (Wright, 1997:418). Nancarrow *et al.* (1998:117) further indicate that some understanding of the perceptual process of consumers could help to design labels that communicate the message in an appealing way. To strengthen this argument Branen and Haggerty (2002:9) stress the fact that consumers undoubtedly will continue to live in a society in which food additives and concerns about it are part of their life. It is argued that food additive perceptions, food additive labelling and the role they play in the consumer decision-making process and consequent purchasing behaviour needs further investigation.

World-wide only a limited number of research projects have attempted to explain consumers understanding (Crowe *et al.,* 1992), perceptions (Wandel, 1997), viewpoints (McNutt, *et al.,* 1986; Kajanne & Pirttilä-Backman, 1996), as well as opinions and practices (Prättälä *et al.*, 1985) with regard to food additives. The only other research studies found (Zibrik *et al.,* 1981; Sloan *et al.,* 1986) relating to food additives and consumers focused on consumers' attitudes. While most of the research studies investigating overall food labelling included the issues of food additive labelling (Crawford & Worsley, 1986; Crawford & Baghurst, 1990; Worsley, 1996; Wandel, 1997; Nancarrow *et al.,* 1998; Siu & Tsoi, 1998; FSANZ, 2003) and food additive safety (Williams *et al.,* 2004) to a limited extent, no study investigating food additive labelling from a consumer viewpoint could be found. In order to explain consumers' perceptions towards food additives, the model suggested in this research will specifically build on Petty and Cacioppo's (1986) ELM to explain consumer information processing and consequent purchasing behaviour of food products containing food additives. Furthermore, the research will adopt a cognitive approach (Solomon, 2004:227,282) because consumers interpret and integrate food additive information they are exposed to in their memories during information processing (Peter & Olson, 2008:104).

1.3 OBJECTIVES OF THE STUDY

One primary objective and six secondary objectives have been identified for this study.

1.3.1 Primary objective

The primary objective of this study was to explore the consumers' perceptions of food additives and how these perceptions influence consequent purchasing behaviour.

1.3.2 Secondary objectives

The following secondary objectives were important towards supporting the achievement of the primary objective:

The literature study (Chapter 4 and Chapter 7) was used to:

- apply the ELM to consumer perceptions of food additives in order to explain consumer information processing and consequent purchasing.

In addition, the empirical study (Chapter 6) was used to:

- determine the consumers' awareness of food additives;
- determine the effectiveness of sources which expose consumers to food additive information with specific reference to the role of the health information media, regulator and manufacturers of food;
- determine to which extent consumers' information search of food additive information influences the purchasing behaviour of food products with regard to food safety and quality;
- determine how the acceptance (reception) of additive information influences the purchasing behaviour of consumers by exploring food additive claims and the ingredient contents list on food products; and
- the development and application of a model of consumers' perceptions and purchasing behaviour pertaining to food additives.

1.4 DEMARCATION OF THE FIELD OF STUDY

The study focused only on the food ingredient and food additive label reader and not on the general public. It also excluded consumers seeking nutritional health claims, nutritional information, brand names and other information provided on food labels because food additive information and not general nutrition information was the focus of this research project. A variety of food additive claim labels were used to investigate consumer's perceptions of food additives. The researcher only investigated the consumers' perceptions about food additives and additive labelling.

This study was conducted from a **consumer science** perspective although the implications for marketing management and marketing communication were also highlighted.

1.5 METHODOLOGY

Two methods of research were used, namely a literature study and empirical research.

1.5.1 Literature study

Various search strategies were employed. The researcher consulted the NEXUS data base to establish whether similar studies were done in SA. Various searches were done on both the North-West University's and the Vaal University of Technology's databases. These online data bases included EbscoHost, Emerald, Medline, Ingenta, Science direct, Sabinet, SpringerLink and Swetswise. Moreover internet searches were also undertaken on the search engines of Yahoo, Google and Cirus.com. Additionally, available textbooks, conference proceedings, newspapers, magazines and thesis were also consulted. Relevant references used in articles were also obtained. A wide variety and different combinations of key words as well as synonyms for keywords were used during the searches. Some key words used, included food additives and consumer concerns, public concerns and food additives, risks of flavourants, colourants and preservatives.

Limited amount scientific articles could be found, of which the most were very old references as can be seen in the reference list. This gives an indication that limited research about food additives and its labelling is being done from a consumer viewpoint. Most of the literature found was from a marketing perspective. Moreover, only a few websites provide information to consumers about food additives. These are mostly the websites of the FAO, WHO, FSANZ and the EU. Retailers such as Pick 'n Pay provides information about additives to consumers on their websites. The literature search was done over a period of four years on a continuous basis.

1.5.2 Empirical research strategy

As an exploratory study, the researcher used the qualitative methodology, since the aim was to gain depth and understanding of issues salient to the consumer in an under-researched area. In light of the objectives of this study, exploratory focus groups, which formed part of the study design in particular (Sternthal & Craig, 1982:17; Krueger, 1994), were used to identify additive labels readers' perceptions. During the preliminary literature review, studies focusing on consumers' main concerns of food labelling and nutritional labelling were consulted. These studies focused more on nutrition, whilst giving limited information about consumers' concern about additives and no discussion of the in-depth reasons thereof. Only two studies were found focusing only on consumers' concerns about food additives. Other studies included food labelling with additives as a small sub-section. Most of these studies (n=12) employed quantitative research strategies with some applying qualitative strategies to a limited extent (n=3), or a combination of both (n=4). None of these studies were done in SA.

1.5.3 Study population

In qualitative studies non-probability sampling methods are utilised and in particular the purposive sampling technique (Babbie & Mouton, 2004:166; Strydom & Delport, 2005:328). The inclusion and exclusion criteria of participants should therefore be clearly defined.

Inclusion criteria were:

- consumers must have all or shared responsibility for the family's household shopping;
- be of ages 20-60 years; and
- be a food additive label reader.

Exclusion criteria were:

- consumers seeking nutritional and health claims;
- consumers seeking nutritional information;
- consumers seeking brand names;
- consumers seeking other information provided on food labels; and
- consumers with reading problems.

The researcher decided to exclude consumers above 60 years because they experience problems reading the small print of food additive ingredient information on food labels. This was indicated by consumers participating in the pilot study.

The researcher and two fieldworkers observed consumers reading food labels in the identified supermarkets, introduced the study to them and determined their keenness and willingness to participate. The selected participants then completed a shopper screening questionnaire. More participants were recruited and completed the screening questionnaire at randomly selected nursery schools in the area (§ 5.6.2). Participants were invited to attend one focus group session. The study was approved by the Ethics Committee of the North-West University (reference number 04k11) on August 30, 2004. All participants completed an informed consent form after explanation of the contents and purpose of the study.

1.5.4 Data collection procedures

The study was conducted making use of the following procedures:

- **Firstly**, the participants completed a food additive **unprompted awareness** scenario presented in a written format. With this measure the researcher determined how aware

consumers were about food additives, food additive terminology and food additive claims on general food items. Unprompted awareness measures the respondents' ability to recall food additives and it provides an indication of **which additives are more on "top of mind"** than others. Until this stage no food additive information had been given to the participants.

- **Secondly,** the participants were given a scenario with the purpose to determine **prompted awareness**. Prompted awareness is a more realistic and accurate **measure of knowledge** and it measures recognition (FSANZ, 2003:51). Participants were asked to read a scenario, select the best suitable product and give reasons for the selection of the product. The two above-mentioned methods also give a common basis for the third part of the empirical study, namely the focus group discussions.
- **Thirdly**, after completion of the awareness scenarios, the **focus group discussions** were conducted with the food additive label reading participants. The purpose of the data collection method was to **determine the participants perceptions** on the different sources of additive information, the application of additive claims, the role food industry plays with regard to food additives, the role of the regulator of food additives, food safety, risks and quality issues with regard to food additives, as well as the reasons for utilising additive information. The focus groups were guided by an interview schedule applying the funneling approach (Carson *et al.*, 2002:125). Questions were, therefore, asked from more general questions (such as general idea of food additives, manufacturer's use of additives, what E-numbers are) to more specific questions (such as: how do food additive claims influence your purchasing decision?).

All the procedures were followed in the sequence explained, during a one hour session. This procedure was continued until saturation of data from the focus groups discussions was reached. Eight focus group sessions were needed before saturation was reached. The empirical research was executed from June to August 2005. The focus groups consisted of two to eleven consumers. All the focus group discussions were tape-recorded and field notes were taken by the moderator.

Before the main study, a pilot study was executed, in order to determine the sequence in which the focus group questions needed to be asked, general household procedures that

needed to be in place, the time needed to complete the procedure, suitability of the venue used and testing of equipment to record information. During the pilot study, the awareness scenario and projective techniques were executed in order to determine the suitability, testing and adoption, as well as data analysis of these procedures. The pilot study was conducted in June 2005.

The data colleted and the literature surveyed were used to develop a model of consumers' perceptions of food additives and consequent purchasing behaviour.

1.5.5 Analysis of qualitative data

Immediately after each focus group discussion the moderator and assistant moderator met to review and complete the notes taken during the discussion. The different tape recordings of the focus groups were transcribed into both electronic and printed form. Each transcript was read several times before beginning the analysis. The transcripts were analysed by means of qualitative content analysis to grounded theory analysis where sub concepts and concepts were identified. The data were then categorised and thereafter the different themes were formulated (Henning *et al.,* 2004:106). The notes that were made during the focus group sessions were analysed by the researcher.

1.6 ASSUMPTIONS

The first assumption made was that food additive label reading consumers are consumers who constantly search for information on mainly food product labels and/or other information sources (for example, health brochures) about specific types of food additives (such as tartrazine) to be excluded from their diet due to health reasons (such as hyperactivity or allergic reactions). In this study food additive label reading consumers also included consumers who wanted to include specific food additives into the diet (such as saccharine for diabetic consumers). Furthermore, food additive label reading consumers also included persons who search food product label information for all types of food additives in order to

be able to exclude most or all possible food additives from their diet due to their specific health beliefs, whether it is for themselves or a family member.

A further assumption made was that consumer perceptions will precede and influence the consumer's purchasing behaviour (Assael, 1995:G3). In addition, an assumption was made that food additive label readers are highly involved in information search and processing. Therefore, the researcher assumed that food additive label readers, due to their high involvement, follow the process of complex decision-making.

Throughout this research the word additive refers to food additives except if specifically stated differently.

1.7 OUTCOMES

Understanding consumers' perceptions of food additive information provided on food labels is required in designing food labelling regulations and improving public health, consequently reducing medical and other costs, while enhancing the profitability of the food industry. To improve the benefits of food labelling policies and the draft food labelling and advertising legislation of SA (SA, 2007), effective design information format and disclosure are important (Wang & Fletcher, 1995:372).

The findings from the study could form the basis for a mass population approach for future information and education strategies for health professionals and other stakeholders interested in educational activities regarding food additives. The perceptions of consumers regarding food additives could be taken into account in developing marketing strategies by producers, food marketers and retailers. Results could also assist retailers to become aware of good labelling practices in their own labelled pre-packed foods. It is recommended that the results of this study should be confirmed by a national survey.

Food manufactures and advertisers could also apply these results and designed model of consumers' perceptions of food additives and consequent purchasing behaviour in the technical design of more effective, understandable, user friendly food labels in terms of food

additives and food additive claims. It can also be applied to the marketing mix in order to improve strategies. Due to the limitations of this study (§ 1.8), in particular the lack of heterogeneity of the sample, it is recommended that the findings of this study should be further exploited by means of a national survey before such strategies are implemented.

Consumer organisations are united in their demands for more research about what information consumers need and want from food labels, with a level of detail on the label that best serves the need of consumers (FAC, 2002:40). This study is, therefore, important because it could shed light on consumers' perceptions of food additive labelling which can be used by the South African label regulators to establish regulation which takes into account the views, needs and wants of the South African consumers. Quantitative research in this area is needed to confirm the results of this study before implementation thereof.

1.8 LIMITATIONS OF THE STUDY

This study was conducted from a phenomenological qualitative approach with a descriptive exploratory nature. The main limitation of this study was related to both the small number of participants and the purposefully selected convenience sample. However, care was taken by using a screening questionnaire to ensure that the participants were food additive label readers. All the participants reside in the urban area of Vanderbijlpark - Vereeniging. While the findings are indicative of trends in food additive label reading behaviour, it is exploratory and inconclusive. Hence, the results should be interpreted with caution and should not be regarded as necessarily representative of the South African population as a whole or be considered as general consumer behaviour. The conclusions are based on the researchers' own judgment and the results cannot be generalised to a larger population.

The next limitation of the study was that demographic data was not obtained. This data could give an indication of the profile of consumers who are reading food additive labels, although this was not the objective of the present study. An additional limitation of the study was that the claims analysis elicited a poor response and yielded insufficient data and was, therefore, not included in this thesis. As it was the last section to be answered, the researcher attributes

the inferior quality of the data to interview fatigue. Package search behaviour was seen as important in the study design because it could reveal valuable information about the participants' ability to used food additive claims in the presence of ingredient list information.

1.9 CHAPTER DIVISION

This research consists of eight chapters and the content of the chapters is summarised as follows:

CHAPTER 1: INTRODUCTION AND BACKGROUND TO THE STUDY

The first chapter deals with the motivation for this study. In addition, it supplies background information on food additives, consumers concerns and the influence of information sources on consumers' perceptions of food additives and how this influences purchasing behaviour, by applying the ELM. This chapter also highlights the problem statement, research objectives and demarcation of the field of study. The research methodology and content is spelt out. In addition, the outcomes of this research are also indicated.

CHAPTER 2: KEY ISSUES OF FOOD ADDITIVES AND THE LABELLING THEREOF

Chapter 2 focuses mainly on the key issues of food additives that cause consumer concerns in the form of a literature review. The definition of additives, types of additives, application of additive legislation world-wide, as well as in SA, the benefits of additives in foods versus food quality, food additive safety/risks issues are discussed. Furthermore, the quality of food additive health information, food additives in relation to food allergies and intolerances and the role of food industry are investigated. Declaration of food additives on labels is also highlighted.

CHAPTER 3: INFLUENCE OF PERCEPTION ON DECISION-MAKING AND PURCHASING BEHAVIOUR

This chapter outlines the role and formation of consumer's perceptions. Furthermore, it deals with how perceptions influence information processing, decision-making and consequent purchasing behaviour. Prior models of the perceptual process, information processing and, consumer decision-making are also reviewed.

CHAPTER 4: PROPOSED MODEL TO EXPLAIN CONSUMERS' FOOD ADDITIVE PERCEPTIONS

The purpose of this chapter is to adapt a model that will explain how consumers' perceptions of food additives influence the way of information processing and consequent purchasing behaviour. The perception model is linked to the ELM.

CHAPTER 5: STUDY DESIGN AND RESEARCH METHODOLOGY

This chapter focuses on the empirical part of the study. It concentrates on the design and the exploratory research method, the selection of the sample population, the development of the probes for focus group discussions, the unprompted awareness questionnaire and prompted awareness projective technique. It also reflects on the use of focus group discussions in consumer research. The methods of data analysis for the different techniques are explained.

CHAPTER 6: RESULTS AND DISCUSSION OF RESEARCH FINDINGS

An analysis, interpretation and evaluation of the research findings are undertaken. The data containing the statements of the participants are presented in table format. Thirty three themes emerged from the focus group discussions.

CHAPTER 7: MODEL OF CONSUMERS' PERCEPTIONS OF FOOD ADDITIVES AND CONSEQUENT PURCHASING BEHAVIOUR

The purpose of this chapter is to describe how the proposed model and the results of the empirical study are combined to develop a model linked to a specific ingredient category. This model explains how consumers' perceptions of food additives influences the way of information processing, decision-making and consequent purchasing behaviour. The ELM, food perception model and other relevant theoretical models are applied in the design.

CHAPTER 8: CONCLUSIONS AND RECOMMENDATIONS

The final chapter summarises the findings of the study and recommendations are made. The implications of the results for the food industry, food manufacturers and consumer organisations are discussed. Ideas for further research are given.

1.10 DEFINITIONS AND TERMINOLOGY

Terminology used in this study will be discussed to clarify the different concepts and motivate the use of these concepts. A definition for each of these concepts is given in alphabetical order as follows:

- **Attention:** The selective process of noticing a stimulus or certain portions of it. It is the momentary focusing of a consumers' cognitive capacity on a specific stimulus (Assael, 1995:G1). In other words, it is the assignment of processing activity to selected stimuli (Solomon, 2004:595).

- **Beliefs:** Expectations that connect an object to an attribute or quality (Sheth & Mittal, 2004:G1).

- **Category**: A classification of concepts. This classification is discovered when concepts are compared with one another and to pertain to a similar phenomenon. Thus

the concepts are grouped together under a higher order, more abstract concept, called a category (Strauss & Corbin, 2004:303).

- **Coding:** The process of analysing the data (Strauss & Corbin, 2004:303). The process of transforming raw data into a standardised form (Babbie, 2004:309).

- **Concepts**: Conceptual labels placed on discrete happenings, events and other instances of phenomena (Babbie, 2004:122; Strauss & Corbin, 2004:303).

- **Consumer decision-making**: Cognitive and emotional aspects such as impulse, family, friends, advertisers, role models, moods and situations that influence a purchase (Schiffman & Kanuk, 2004:G3).

- **Content analysis**: Raw data is analysed taking into account both the content and context of the statements. Themes are identified, with the researcher focusing on the way the theme is treated or presented and the frequency of its occurrence. The analysis is then linked to outside variables such as gender and role of the contributor (Spencer *et al.*, 2005:200).

- **Complex decision-making:** Making decisions through a process of active search for information. Based on this information, alternative products are evaluated on specific criteria. The cognitive process of evaluation involves consumer perceptions of product characteristics and development of favourable or unfavourable behaviour towards a product. The assumption is that consumer perceptions will precede and influence behaviour (Assael, 1995:G3).

- **Comprehension:** The opportunity, motivation and ability to understand, interpret and create meaning selectively out of stimuli and symbols (Assael, 1995:G3; Shimp, 1997:571; Schiffman & Kanuk, 2004:G2).

- **Consumer information processing:** The nature of the consumer's search for and reactions to marketing communications. The process by which consumers perceive

information in four steps – exposure to information, attention, comprehension and retention of information (Assael, 1995:G3).

- **Deceptive advertising:** Advertising that gives false information or that willfully misleads consumers about the product's benefits (Assael, 1995:G4; Sheth & Mittal, 2004:G3).

- **Depth interview:** An unstructured, personal interview in which the interviewer attempts to get participants to talk freely and to express their true feelings. It can be conducted individually or in focus groups. The latter has the advantage of electing more information because of the group interaction (Assael, 1995:G4).

- **E-number:** The E-system is developed by the EU (formally the European Economic Community) and provides a list of several commonly used food additives. The list is updated on a regular basis. Nutrients are not included in the E-system (Branen & Haggerty, 2002:2).

- **Elaboration:** Elaboration is the creation of complex networks of ideas and feelings about products within the memory based upon the messages transmitted to consumers (Foxall *et al.,* 2002:83, Hoyer & MacInnis, 2001:183). Elaboration involves thinking about what the message is saying, evaluating arguments in the message, agreeing with some or disagreeing with others (Shimp, 1997:572). Petty and Cacioppo (1986:7) explain that elaboration is the extent to which a person carefully thinks about issue-relevant information. In a persuasive context, elaboration refers to the extent to which a person scrutinises the issue-relevant arguments contained in persuasive communication.

- **Elaboration likelihood model:** A theory of persuasion that predicts two forms of message processing through the central and peripheral routes. Message processing through the central route occurs under high involvement and leads to a more permanent behaviour change than the latter (Shimp, 1997:572). An information processing model that postulates that the degree to which the consumer elaborates on a

message depends on its relevance (Assael, 1995:G5; Solomon, 2004:597), or on a consumer's level of involvement (Schiffman & Kanuk, 2004:G4). The more relevant the message or stimulus, the more elaborate or central processing takes place. The less relevant the message or stimulus, the more non-elaborate or peripheral processing takes place (Assael, 1995:G5).

- **Exposure:** An initial stage of perception (Schiffman & Kanuk, 2004:597) that occurs when consumers' senses (sight, hearing, touch, smell) are activated by a stimulus (Assael, 1995:G5).

- **Extended problem-solving:** An elaborative decision-making process, often initiated by a motive that is fairly central to the self-concept and accompanied by perceived risk. The consumer tries to collect as much information as possible, and carefully weights the product alternatives (Solomon, 2004:597).

- **Grounded theory:** Grounded theory involves the generation of analytical categories and their dimensions, and the identification of relationships between them. The process of data collection and conceptualisation continues until categories and relationships are "saturated", in other words no new data is added to the developing theory (Strauss & Corbin, 1998:122; Spencer *et al.*, 2005:201).

- **Incidental additives:** It is any substance that comes into contact with food during its growth or processing. Examples range from rodent hairs, oil and metal pieces from a machine and insect fragments to detergent residues remaining on dishes after washing (Clark, 2005:71; Weigley *et al.*, 1997:29).

- **Information processing:** A cognitive theory of human learning patterned after computer information processing that forces the focus on how information is stored in human memory and how it is retrieved (Schiffman & Kanuk, 2004:G6).

- **Interpretation**: A step in the perception process in which meaning is attached to the stimulus (Sheth & Mittal, 2004:G6).

- **INS system**: An International numbering system (INS) for food additives is based on the E-number system. The INS system is broader than the E-numbering system and is intended as an identification system for food additives approved for use in more than one country The INS numbers are largely based on the E-numbers used in the E-system without the E (Branen & Haggerty, 2002:2).

- **Involvement**: The degree of personal relevance of an object or product or service to a consumer (Sheth & Mittal, 2004:G6). In other words the motivation to process product related information (Solomon, 2004:598).

- **Involvement theory**: A theory of consumer learning which postulates that consumers engage in a range of information processing activities, from extensive to limited problem-solving, depending on the relevance of the purchase (Schiffman & Kanuk, 2004:G6).

- **Low involvement purchases:** Low involvement purchases that are less important to the consumer. Identity with the product is low, because it may not be worth the consumer's time and effort to obtain information about the product and to consider a wide range of alternatives. Low involvement purchases are associated with a more limited process of decision-making (Assael, 1995:G7).

- **Marketing stimuli**: Information about products communicated by either the marketer (for example via advertisements, sales people, symbols, packages, signs and prices) or non-marketing sources (such as the media, word-of-mouth) (Assael, 1995:G8; Hoyer & MacInnis, 2001:81).

- **Motivation, Opportunity and Ability (MOA):** Motivation, opportunity and ability, the factors that determine each individual's elaboration likelihood for a particular message or stimulus (Shimp, 1997:574).

- **Motivation:** One of the factors which determine each individual's elaboration likelihood for a particular message or stimulus (Shimp, 1997:574). The driving force within individuals that impels them to action (Schiffman & Kanuk, 2004:G7).

- **Open coding**: The process of breaking data down and examining, comparing, conceptualising and categorising data (Strauss & Corbin, 2004:303).

- **Opportunity:** A term referring to whether it is physically possible for a person to process a message or stimulus (Shimp, 1997:574).

- **Perceived risk**: The degree of uncertainty perceived by the consumer as to the consequences (outcome) of a specific purchasing decision or choice (Schiffman & Kanuk, 2004:G8; Sheth & Mittal, 2004:G8).

- **Perception**: The process by which an individual selects, organises and interprets stimuli into a meaningful and coherent picture of the world (Schiffman & Kanuk, 2004:G8; Solomon, 2004:99).

- **Perceptual blocking**: The subconscious "screening out" of stimuli that are threatening or inconsistent with one's needs, values, beliefs or attitudes (Schiffman & Kanuk, 2004:G8).

- **Peripheral and central routes to persuasion:** A promotional theory that proposes that highly involved consumers are reached the best through advertising that focuses on the specific attributes of the product (the central route), while uninvolved consumers can be attracted through peripheral advertising cues such as the model or the setting (the peripheral route) (Schiffman & Kanuk, 2004:G2). In other words, a message or stimulus is interpreted cursorily by attending to its form rather than its content for the peripheral route (Sheth & Mittal, 2004:G8).

- **Projective technique:** Motivation research or projective techniques are designed to provide information on latent motives (Hawkins *et al.*, 2004:363). In this project it

refers to the completion technique of analysis and use. Responses are analysed to determine what themes are expressed. Content analysis is the examining of responses for themes and key concepts used (Hawkins *et al.*, 2004:364).

- **Purchasing behaviour**: Behaviour that involves two types of purchases: trial purchases (the exploratory phase in which consumers attempt to evaluate a product through direct use) and repeat purchases, which usually signify that the product meets with the consumer's approval and that the consumer is willing to use it again (Schiffman & Kanuk, 2004:G9).

- **Purchasing decision:** It is the process of weighing the consequences of product alternatives to come to a final product decision (Erasmus *et al.*, 2001:82).

- **Purchasing intention:** A decision plan or intention to buy a particular product (Peter & Olson, 2008:530).

- **Reliability:** The degree to which a measurement instrument is consistent in what it measures (Schiffman & Kanuk, 2004:G10).

- **Source:** In marketing communications a source is a person, label, group or organisation that delivers a message. Marketing communication sources influence receivers by possessing one or more of three basic attributes: power, attractiveness and credibility (Shimp, 1997:576).

- **Source credibility:** The level of expertise and trustworthiness (Assael, 1995:G12) or the perceived honesty and objectivity (Schiffman and Kanuk, 2004:G10) that consumers attribute to the source of the marketing message (Assael, 1995:G12; Solomon, 2004:601).

- **Stimuli:** Any physical, visual or verbal communication that can influence a consumer's response (Assael, 1995:G12).

- **Triangulation:** Involves the use of different methods and sources to check the integrity of or extent of inferences drawn from the data (Ritchie, 2005:46).

- **Trustworthiness:** The honesty, integrity and reliability of a source (Shimp, 1997:576).

- **Validity:** The degree to which a measurement instrument accurately reflects what it is designed o measure (Schiffman & Kanuk, 2004:G11).

1.11 GENERAL

The following remarks refer to the general outlay of the thesis:

- annexures are provided at the end of the thesis;
- tables and figures are placed on the relevant pages within the thesis;
- where no sources are mentioned for figures and tables it refers to own research;
- referencing is based on the Quoting Sources of the North-West University (Van der Walt, 2006); and
- if reference is made to only the year of publication, the emphasis is placed on the general impression of the researcher and not only a particular part of the source.

CHAPTER 2

KEY ISSUES OF FOOD ADDITIVES AND THE LABELLING THEREOF

2.1 INTRODUCTION

The specific purpose of this chapter is to provide an overview of the key issues about food additives that cause consumer concerns, in the form of a literature review. A historical overview, the definition of additives, types of additives, application of additive legislation world-wide, as well as in SA is discussed. Furthermore, the benefits of additives in foods versus food quality, food additive safety/risks issues were addressed. The quality of food additive health information, food additives in relation to food allergies and intolerances and the role of food industry are investigated. Declaration of food additives on labels is highlighted, as well as consumer perceptions about food additives.

Food additives have been used for centuries to enhance the quality of food products (Burdock & Carabin, 2004:4; EUFIC, 2004a:1). Smoke, oil, vinegar, salt and spices were used to preserve food (EUFIC, 2004b:1). Until the time of the Industrial Revolution, these and a limited number of other chemicals were the major food additives used. The Industrial Revolution brought about many changes in the food supply, including a better understanding of foods and a demand for both increased quality and quantity. This resulted in the development of a variety of chemicals which were used to preserve, as well as enhance the colour, flavour and texture of food (Branen *et al.*, 2002:v). Together with the increase in technological development and better living standards, additive usage in foods significantly increased during the late 1950's (Branen *et al.*, 2002:v; McWilliams, 2005:546). More than 2000 different chemicals were being used in foods by the early 1960s. The demand for new, tasty (Sloan, 2004a:14), convenient and nutritious foods continued to increase from then until today. It is estimated that over 2500 different additives are currently being used in foods (Branen *et al.*, 2002:v).

2.2 HISTORICAL OVERVIEW OF FOOD ADDITIVES

Although additives have been used for centuries, there has always been some concern regarding the safety of consuming food additives used in foods (Branen *et al.*, 2002:v). The first real concern regarding food additives was expressed by Wiley (Bennion, 1980:118). His work led to the first regulations to control the use of food additives (Bennion, 1980:118; Branen *et al.*, 2002:v). The 1906 Pure Food and Drug and Cosmetic Act led directly to the development of the Federal Food, Drug and Cosmetic Act of 1938 (FD&C) (§ 2.13 & § 2.12.1) and had a direct impact on food additive use (Bennion, 1980:118; FDA, 1992; Burdock & Carabin, 2004:4).

Although this early legislation provided some control, implementation of these laws by the FDA was limited by the ambiguous legislative standard of "harmfulness", the fact that the burden of proof was placed on the FDA and the lack of scientific knowledge of safety evaluation of additives. However, the greatest legal impact on food additive use occurred with the passage of the 1958 Food Additive Amendment (Bennion, 1980:118; FDA, 1992; Burdock & Carabin, 2004:5; McWilliams, 2005:549). This was followed by the 1960 Colour Additives Amendment which remedied the limitations of previous legislation by shifting the burden of proving safety of additives to the manufacturer of food (Branen *et al.*, 2002:v).

Manufacturers now need to require pre-marketing safety data on all food additives. The Food Additive Amendment also included the controversial Generally Recognised As Safe (GRAS) (§ 2.12.4) list and the Delaney Amendment, whilst the FDA also changed the word "harmfulness" to "safety" (Bennion, 1980:119; Branen *et al.*, 2002:v; Burdock & Carabin, 2004:6; McWilliams, 2005:548). Together with the increased knowledge of toxicology, it brought about greater attention to the possible risk of food additives. The increase in consumerism and the anti-establishment views of the 1970s led to a continuing controversy over food additives among scientists, lawyers, consumer advocates and policy makers. The legislation and controversy surrounding food additives resulted in the banning of some chemicals as well as a lessened submission of new chemicals for approval. From 1960 to 1980 very few chemicals were approved for use whilst several were banned (Branen *et al.*, 2002:vi).

During the 1990s, the food processing industry became more global. As more processed foods were produced for export, the requirement for a working knowledge of world food additives regulation become paramount. This led to increased pressure for countries to adopt similar food additive regulations (Branen *et al.*, 2002:iv). South Africa's is a members of Codex Alimentarius (Neall, 2002a:27) and thereby following their guidelines. The Codex Alimentarius has become an important guide to food additives and a steppingstone to improving world food marketing (Branen *et al.*, 2002:iv). As mentioned before, food additives have been a source of considerable controversy. Food additives constitute such a debatable topic that even the definition is the subject of argument.

2.3 DEFINITIONS OF FOOD ADDITIVES

Three different definitions, each serving a different purpose will be discussed in order to clarify the complex issue of food additives. It also helps to explain the various perceptions that consumers have about food additive.

The first definition is of particular importance to the South African consumers, retailers, marketers and manufacturers as it is the legal definition used by the Department of Health (DOH). According to the Regulation Relating to the Labelling and Advertising of Foodstuffs, (SA, 2007) as set out in the FC&D Act (SA, 1972) for SA, food additives are defined for legal purposes as:

"*Any substance not normally consumed as a foodstuff by itself and not normally used as a typical ingredient of the foodstuff, whether or not such substance has nutritive value, the intentional addition of which to a foodstuff for a technological (including organoleptic) purpose in the manufacture, processing, preparation, treatment, packing, packaging, transport or storage of such foodstuff results or may reasonably be expected to result (directly or indirectly) in such substance or the byproducts thereof becoming a component of or otherwise affecting the characteristics of such a foodstuff, excluding any substance added to foodstuffs for maintaining or improving nutritional qualities or any contaminants*".

The abovementioned definition is equivalent to the international definition of food additives, as developed by the Codex Alimentarius Commission (Fraser, 1993b:30).

However, the legal definition of food additives is not very useful in dealing with practical problems from the consumer point of view. Therefore, the committee on Food Protection of the National Research Council (NRC) in the USA suggested another definition for general use (Bennion, 1980:120; McWilliams, 2005:547). This definition is making it easier for the general consumer to understand what is meant by a food additive. According to the second definition (Food Protection Committee, 1981), a food additive is:

"A substance or a mixture of substances, other than a basic foodstuff, that is present in a food as a result of any aspect of production, processing, storage, or packaging (the term does not include chance contaminants).

Finally, the third definition included in this study is used by the FDA. This definition is important for consumers (to know which substances are on the GRAS list) and manufacturers (for example, in the labelling of export products) as it made a distinction between substances used before and after January 1, 1958. This is, however, not specifically indicated in the new South African draft regulation (SA, 2007). This definition bears a legal impact in the USA. According to the FDA (Bennion, 1980:119), a food additive is:

"Any substance, the intended use of which results or may reasonably be expected to result, directly or indirectly, in its becoming a component of or otherwise affecting the characteristics of any food (including any substance intended for use in producing, manufacturing, packing, processing, preparing, treating, transporting or holding a food; and including any source of radiation intended for any such use) if such substance is not generally recognized, among experts qualified by scientific training and experience to evaluate its safety, as having been adequately shown through scientific procedures (or, in the case of substances used prior to January 1, 1958, through either scientific procedures or experience based on common use in food) to be safe under the conditions of its intended use."

Another term used in relation to food additives that needs clarification is the E-numbering system. The E-number signifies the approval of an additive by the EU. To obtain an E-number, the additive must have been fully evaluated for safety by the SCF (Scientific Committee on Food in the EU). Furthermore, the E-numbering system serves as a simple and convenient way to label permitted food additives across the range of languages in the EU. Nutrients are not included in the E-numbering system (Jukes, 2001:2; Branen & Haggerty, 2002:2; EUFIC, 2004a:3). Additionally, the Codex Alimentarius Commission Committee on Food Additives and Contaminants has developed an International Numbering System (INS) for food additives based on the E-numbering system. The INS numbering system is broader than the E-numbering system and is intended as an identification system for food additives approved for use in one or more countries. The INS numbers are largely the same numbers as used in the E-numbering system, but without the E (Branen & Haggerty, 2002:2). The E-number list, as well as the GRAS list are updated regularly.

As illustrated by the definitions, food additives are distinguished from food or natural food constituents. A food or natural food constituent becomes a food additive when it is added to another food. The above-mentioned definitions include both direct additives and indirect additives (Schmidt, 2000:82). These definitions, therefore, provide some indication of the classification of the different types of food additives.

2.4 TYPES OF FOOD ADDITIVES

Food additives can be divided into three main groups based on the action that occurs when additives are added to food products. The first action is incidental (Bennion, 1980:120; Weigley *et al.*, 1997:28) or accidental (McWilliams, 2005:552), the second action is called indirect addition and the third is intentional addition of food additives (Bennion, 1980:120; Weigley *et al.*, 1997:29).

2.4.1 Incidental or accidental food additives

Incidental food additives can be described as any substance that comes into contact with food during its growth or processing. Examples range from rodent hairs, oil and metal pieces from a machine and insect fragments to detergent residues remaining on dishes after washing (Weigley *et al.*, 1997:29; Sumner & Eifert, 2002:29; Clark, 2005:71).

2.4.2 Indirect food additives

Indirect food additives can be explained as something that is present in a food package, and thus potentially in the food when eaten. An example is foods that may pick up substances from their wrappers or containers (FDA, 1992; Weigley *et al.*, 1997:29; Sumner & Eifert, 2002:29). Thus, careful monitoring of production from the initial ingredients to the packaged product is essential for elimination of such problems. McWilliams (2005:552) argues that there is no intent that incidental and indirect food additives should be part of the food. It is still important to include this type of additives in the literature review as consumers might be concerned about the risks that incidental and indirect food additives might have on the health of consumers although it is not listed on food labels.

2.4.3 Intentional food additives

Intentional food additives, on the other hand, are those substances of known composition that are deliberately added to food to serve some useful purpose at intended levels. Unreliable use of food additives in food manufacturing is not allowed by the FDA. Furthermore, the unnecessary use of food additives is not favoured by the food manufacturers either because of the added cost. Stabilisers, colourants and flavour enhancers fall into this category (FDA, 1992; Weigley *et al.*, 1997:28; Sumner & Eifert, 2002:29; McWilliams, 2005:552).

Intentional additives are of importance for this study, because information about the use of these substances in foods must be disseminated to consumers through the food labels according to the draft Regulation Governing the Labelling and Advertising of Foodstuffs (SA,

2007) (§ 2.3). In order to understand consumers' perceptions about food additives fully, the next section deals with the different categories of intentional food additives.

In order to understand and explain consumers' perceptions of intentional food additives it is important to distinguish between food additive categories and the functions that it performs in food products.

2.5 FOOD ADDITIVE CATEGORIES

Branen and Haggerty (2002:1) further divided intentional food additives into six major categories.

2.5.1 Preservatives

Three types of preservatives are used in foods, namely:

- antimicrobials which are used to extend the shelf-life of numerous snacks and convenience foods. These additives have come into even greater use in recent years as microbial food safety concerns have increased. Antimicrobials are identified by E and INS-numbers 200 to 290;
- antioxidants, which are indicated by INS and E-numbers 300 to 326 are used to prevent lipid and/or other vitamin oxidation and the subsequent development of rancidity and off-flavours in food products. They are useful in preserving dried fruits and frozen foods for an extended period of time. They may vary from natural substances such as vitamin A and E to synthetic chemicals such as butylated hydroxyanisole (BHA) and butylated hydroxytoluene (BHT); and
- anti-browning agents are chemicals used to prevent both enzymatic and non-enzymatic browning in food products. These food additives are classified as either antioxidants or preservatives in the INS-system (Bennion, 1980:121; Branen & Haggerty, 2002:2; EUFIC, 2004a:4).

Consumers indicated that food containing no preservatives was a specific characteristic they were looking for when shopping for food (McNutt *et al.*, 1986:74; Williams *et al.*, 2004:34)

and are more concerned about preservatives than about the kilojules that a product contains (Worsley, 1996:75; ACNielsen, 2005a).

2.5.2 Nutritional food additives

Nutritional additives have increased in use in recent years as consumers have become more concerned about and interested in their health and nutrition. As mentioned before, nutrients are not included in the E-numbering system. The increased interest in nutrition has also led to the rapid growth of the functional food or nutraceutical industry with the development of several food additives for the purpose of enhancing overall health (Branen & Haggerty, 2002:3; Sunley, 2007:12).

2.5.3 Flavourants

The greatest number of additives used in foods can be found in this category. The three major types are sweeteners, natural and synthetic flavourants and flavour enhancers (Bennion, 1980:123; Branen & Haggerty, 2002:4; EUFIC, 2004b:5). Consumer concerns regarding flavourants were more directed towards synthetically than naturally occurring flavourants (McNutt *et al.*, 1986:75). Furthermore, consumers indicated that artificial flavourants give food a poorer taste than natural flavourants (Zibrik *et al.*, 1981:49; McNutt *et al.*, 1986:76; Bruhn, 2002:102).

2.5.4 Colourants

Food processors use food colourants to optimise the attractiveness, appeal and presumptive appetising features of foods to the consumer. Technically, a colour additive or colourant is any dye, pigment, or substance that can impact colour when added or applied to foods (Duxbury, 2005:68). A number of natural and synthetic additives are used to colour foods (FDA, 1992). Colourants are included in the E-numbering system as E100 to E180 or INS 100 to INS 182.

There has been much controversy regarding the use of colourants in recent years (Branen & Haggerty, 2002:3; EUFIC, 2004b:5) such as tartrazine. Some consumers are of the opinion that colourants are only marketing devices. Furthermore, some consumers become disturbed by reports of some colourants that may be carcinogenic or may cause allergic reactions. On the other hand, Bennion (1980:123) indicates that colourants should not be used to conceal inferior quality in foods. However, as with all additives, the use of colourants is controlled by law and permission to use them is only given if proven safe for consumption (Fraser, 1993b:37). Although synthetic colourants are used extensively, there is an increased interest in natural colourants amongst both consumers and industry (Branen & Haggerty, 2002:3; EUFIC, 2004b:5). Worsley (1996:76) showed that consumers' thought that preservatives were more important than colourants, and colourants were in turn more important than flavourants when reading nutrient label information.

2.5.5 Texturising agents

Although flavourants comprise the greatest number of chemical additives, texturising agents are used in the greatest quantity. These agents are used to modify the overall texture or mouth-feel of food products and include emulsifiers and stabilisers. Emulsifiers can be natural substances such as lecithin as well as several synthetic derivates. Stabilisers include several natural gums such as carrageenan as well as natural and modified starches (Branen & Haggerty, 2002:4; EUFIC, 2004a:5).

2.5.6 Miscellaneous food additives

There are numerous other chemicals used in food products for specific, yet limited purposes. Indeed the various processing aids such as chelating agents, enzymes and anti-foaming agents, surface finishing agents, catalysts and various solvents, lubricants and propellants are widely used (Branen & Haggerty, 2002:5). Edible barcodes or marks placed on foods, for example, meat coding are by definition also regarded as food additives (Nightingale & Christens-Barry, 2005:36).

In order to understand consumers' perceptions about food additives it was important in this study to determine consumers' understanding and knowledge about the different food additive categories.

2.6 FUNCTIONS AND USAGE OF FOOD ADDITIVES

Since prehistoric times, chemicals have been added to foods to perform special functions. Although basic food contains no additives, as foods are processed for conversion into a variety of products, an increasing number of food additives are generally used. Fortunately, several food additives commonly serve more than one function in foods (Branen & Haggerty, 2002:1).

2.6.1 Functions of food additives

Chemical food additives are incorporated into foods directly or migrate into foods from the environment or packaging materials. In some instances a food additive is a substance which intended use will lead to its incorporation into the food or will affect the characteristics of the food. These food additives generally provide some type of benefit to the consumer and the food manufacturer. In the case of the consumer, food additives can improve sensory qualities of foods, improve nutritive value, or ease the preparation of ingredients and meals (Sumner & Eifert, 2002:28; McWilliams, 2005:551).

The benefits of food additives to the food processor are to:

- maintain or improve the nutritional quality of the product;
- maintain or improve safety and quality;
- aid in processing or preparation; and
- enhance sensory characteristics.

All of the above have the aim to add variety in the consumer's diet (Sumner & Eifert, 2002:28; ELC, 2003:2).

To recognise the South African consumers' perceptions about food additives, it was evident that consumers' awareness about the functions of additives should be investigated further.

2.6.2 Usage of food additives

Food additives may play a variety of roles in food, but according to food laws, they must serve useful purposes (Bennion, 1980:120). The only way to ensure that food with an acceptable quality arrives at the consumer's table is through the use of food additives. Thus food additives are used to overcome the problems caused by the long and complex supply route that convenience foods must pass through. The acceptance of convenience foods by consumers and the strong market for these items support food manufacturers in their commitment to use food additives (McWilliams, 2005:549). The absence of food additives will make the manufacturing of convenience foods difficult.

Food additives are used for a variety of reasons (functional needs), such as:

- to enhance nutritive value;
- to improve flavour;
- to improve colour;
- to extend shelf life;
- to improve texture;
- to control pH;
- for leavening;
- for bleaching and maturing; and
- to ease manufacturing problems (Bennion, 1980:120; FDA, 1992; McWilliams, 2005:552).

These uses have economic implications for both the consumers and manufacturers since they are used to create highly palatable, nutritionally enhanced foods and to make production and processing easier (McWilliams, 2005:551).

Food additives that are added to foods may be synthetic compounds, synthesised to be identical to their natural source or derived from natural plant or animal sources. Chemicals

that are considered to be food additives may be naturally occurring in some foods and ingredients or artificially added to a food, and then labelled as artificially added as it is not normally found in that particular food product (Sumner & Eifert, 2002:29).

2.7 BENEFITS OF FOOD ADDITIVES

Consumers appear to be unaware of the potential benefits of additives. For example, consumers thought that food colourants were unnecessary and believed it made food less safe (Kidd, 2000:54; Bruhn, 2002:102). There are many recognised benefits to be derived from food additives. Some of the major benefits are a safer and more nutritious food supply, a greater choice of food products and a lower-priced food supply (Branen & Haggerty, 2002:5).

2.7.1 Safer and more nutritious foods

There is no doubt that preservatives and nutritional additives used in foods increase the safety and overall value of many food products. The use of several antimicrobials is known to prevent food poisoning from various bacteria and moulds. In addition, the use of various nutritional additives such as vitamins is also of proven value in preventing nutritional deficiencies (IFT, 1988:121; Branen & Haggerty, 2002:5).

2.7.2 Greater choice of foods

Food additives play an important role in today's complex food supply. Never before has the range and choice of foods been so wide in terms of availability in supermarkets and specialist food shops (EUFIC, 2004a:2). Most supermarkets carry more than 20 000 food items, providing the consumer with a wide range of different food products from which to choose (Branen & Haggerty, 2002:5). The availability of food additives has allowed the production of numerous out-of-season foods and a variety of new food products. Food additives increased the development of convenience foods, snack foods, low-kilojoule and health promoting or functional foods, exotic foods and a variety of food substitutes. Furthermore, additives allow foods to be pre-prepared whilst maintaining acceptable flavour, texture and

nutritional value. It is estimated that the shelf-life of cereal products can be increased by 200% by using food additives (Branen & Haggerty, 2002:5).

The increased interest of consumers in dieting has resulted in a proliferation of low-kilojoule food items. In addition, colourants and flavourants have enhanced the appeal of these foods to consumers. For example, margarine and soy meat products would not exist without the use of food additives (IFT, 1988:121). The same is true for many soft drinks, which are primarily a mixture of a wide variety of food additives. The beverage industry is one of the greatest users of food additives (Branen & Haggerty, 2002:5).

2.7.3 Lower-priced foods

According to Branen and Haggerty (2002:6), there is evidence that food additives reduce the overall price of foods. Angeline and Leonardos (1973:48) indicated that at least for some processed foods, total removal of food additives would result in higher prices. This study was based on the principle that the consumer would still desire the same types of foods in the absence of food additives. Although packaging or processing procedures could be developed to replace the need for food additives, in most cases processing or packaging alternatives are not as cost effective as the use of food additives (IFT, 1988:120; Branen & Haggerty, 2002:6). However, it must be recognised that some of the additive-containing foods could be replaced with food free from additives. It is also important to realize that the assumption that food additives lower the price of foods is based on maintaining the same type and quality of foods currently available. Without food additives an excellent food supply at a reasonable cost will still be possible. However, to provide the consumers with the variety of foods along with the other benefits would cost more without food additives (Branen & Haggerty, 2002:6).

It is unrealistic for the food industry to expect to convince consumers that all food additives are beneficial. Unfortunately consumers perceptions toward food chemicals is simply too negative (McNutt *et al.,* 1986:75; Sloan *et al.*, 1986:523; Kajanne & Pirttilä-Backman, 1996:217; Brimer, 2004:33; Williams *et al.*, 2004:35). Thus the study of consumers' perceptions about food additives can give an indication to the food industry and consumer educationist as to which food additive benefits consumers regard as important. This could

assist then to focus their information efforts about food additives on specific consumers needs.

2.8 RISKS OF FOOD ADDITIVES

Despite the benefits attributed to food additives, there are also a number of concerns regarding the potential short and long-term risks of consuming food additives. Critics of additives are concerned with both indirect and direct impacts of using additives. As for many of the benefits mentioned above, there is not always adequate scientific proof of whether or not a particular additive is safe (Branen & Haggerty, 2002:6). Little or no data are available concerning the health risks or joint effects of the food additive cocktail consumers consume daily (Branen & Haggerty, 2002:6) and future research is recommended (Scotter & Castle, 2004:121).

Consumer concerns about the safety of food ingredients and additives are longstanding (McNutt *et al.*, 1986:73), although distress about food additives is expressed by a relatively small percentage of USA consumers (Bruhn, 2002:101). The number of American consumers who classified food additives as a serious health hazard decreased from 36% in 1987 to 21% in 1997 (FMI, 1990; ABT Associates Incorporated, 1997). Similarly, those viewing artificial colourants as a serious health hazard decreased from 28% in 1985 to 21% in 1990 (FMI, 1990). Only 1% of USA consumers consider additives, preservatives and artificial colourants as harmful (ABT Associates Inc, 1997). In addition, amongst European consumers, artificial colourants is considered very dangerous by 39% of the consumers and additives and preservatives by 31% of them (Tordjman, 1995:90). Additives and preservatives are considered hazardous by relatively few Australians. Five percent mentioned additives and 4% preservatives as a perceived threat to food safety in a 1996 study (Australian Supermarket Institute, 1997). This is a decrease from 12% for food additives as a reason for concern and 10% for preservatives since 1992 (Bruhn, 2002:102). ACNielsen (2005a) found that consumers in developing countries (such as SA) appear to be more concerned about preservatives and additives than consumers in developed countries, where the focus is more on kilojoule content.

The indirect risks that have been described for additives are the converse of some of the benefits to its use. While it is accepted that through additives a greater choice and variety in the food supply have been made available, there is no question that additives have also resulted in the increased availability of food products with a low density of nutrients. These so-called junk foods, which include many snack items, can in fact be used as substitutes in the diet of more nutritious foods. Recently the food industry has attempted to address the low density of nutrients in junk foods by adding nutritional additives to snack foods to make them more nutritious (Branen & Haggerty, 2002:7).

Of greater concern than the indirect risks are the potential direct toxicological effects of additives. Short-term severe effects from additives are unlikely. Only a small number of additives are used at a level that will cause a direct toxicological impact, although there have been incidences where this has happened. Of particular concern are the hypersensitivity reactions to some additives that can have a direct and severe impact on sensitive individuals even when chemicals are used at legally acceptable levels. The reactions to sulfate are an example of such a problem (FDA, 1994; Fraser *et al.*, 2000:241; EUFIC, 2004a:3). With proper labelling, however, sensitive individuals should be able to avoid potential allergens (Branen & Haggerty, 2002:7; FSANZ, 2005).

Unfortunately, the toxicological problems resulting from the long-term consumption of additives are not well documented (Branen & Haggerty, 2002:7). Cancer (Prättälä *et al.*, 1985:240; McNutt *et al.*, 1986:77; Sloan *et al.*, 1986:524; IFT, 1988:119; Abbott, 1992:329; Rowe & Briggs, 1995:5; Bruhn, 2000:6; Branen & Haggerty, 2002:7; Paterson, 2002:4; Williams *et al.*, 2004:35) and reproductive problems are consumers' primary concern, although there is no direct evidence linking additive consumption with the occurrence of cancer and reproductive problems in humans (Branen & Haggerty, 2002:7). There are, however, animal studies that have indicated potential problems with some additives. Food additive interactions are also a source of concern (Scotter & Castle, 2004:95). Although most of the additives posing a health risk have been banned, some continue to be used with, the most notable being saccharine (Branen & Haggerty, 2002:7). Most existing additives and all new ones must undergo extensive toxicological evaluation (§ 2.11) to be approved for use. Although questions continue to be asked regarding the validity of animal studies, there is

consensus among scientists that animal testing does provide the information needed to make safety decisions (Branen & Haggerty, 2002:7; McWilliams, 2005:581).

The consumers' perception of the risks associated with foods in general is categorised by Wodicka (1977:76) into five groups ranking in order of importance as:

- foodborne hazards of microbial origin;
- nutritional hazards;
- environmental contamination hazards;
- foodborne hazards of natural origin; and
- food and colour additive hazards.

More that two decades later the Scottish Consumer Council's Consumer Network ranked the three major health issues of food that concern consumers the most as:

- food hygiene;
- genetically modified foods; and
- the use of chemicals, pesticides and additives (Kidd, 2000:54).

Wodicka (1977:76) and Kidd's (2000:54) findings are consistent with Roberts' (1978:2575) and Kramer and Penner's (1986) findings who also ranked health hazards associated with the use of food additives the lowest. These categories of risks indicate that food additives are considered as posing a health risk to consumers, although it is not on top of the list.

Food manufacturers are required by law to ensure safety and quality of their food products, regardless of the source of identity of the ingredients. Traditional foods are viewed by the FDA as "safe" based on a long history of use. The consuming public also views traditional foods as safe. However, many traditional foods contain naturally occurring toxins, such as solanine in green potatoes (Bennion, 1980:125) that can present hazards to consumers under some circumstances of exposure. Fortunately, in most instances naturally occurring toxins are present in concentrations that are not hazardous to consumers ingesting typical quantities of the food prepared under typical conditions. Also, some traditional foods are allergenic to some consumers, even though they are safe for the vast majority of consumers (Anon., 2000:53). The concept of risk has been proposed as one of the most important concepts for understanding how consumers make choices, influencing not only decision-making, but also

information search (Mitchell, 1999:190; Conchar *et al.,* 2004:433; Aqueveque, 2006:237) and are, therefore, of particular relevance in the present study.

2.9 BALANCING THE RISKS AND BENEFITS OF FOOD ADDITIVES

The concept of risk versus benefits about food additives has evolved from the additive controversies (McWilliams, 2005:549). Due to the difficulties in precisely defining the risks and benefits of individual additives, a legal rather than a scientific decision is commonly made regarding the safety of a food additive. During such a decision, the potential risks must be weighed against the potential benefits. Familiar examples of a balance between benefits and risks are nitrates and nitrites used in curing meat (McWilliams, 2005:549) and saccharin (Branen & Haggerty, 2002:7). Saccharin will be discussed further in order to explain the concept of balancing the benefits and risks of food additives. Although there is no direct evidence that saccharine (§ 2.13.2.1), in the low amounts consumed in foods, causes cancer in humans, risk evaluation in rats indicates a potential of cancer in humans. On the benefit side, saccharine is an excellent non-kilojoule sweetener that is useful for diabetic patients and for those who want to reduce their kilojoule intake. Many consumers feel that the benefits outweigh the risks of using saccharine. The FDA initially issued a ban on saccharine based on the available risk information. The recognition of low-kilojoule foods demanded by the consumers led to the USA Senate decision to place a moratorium on the ban of saccharine (Branen & Haggerty, 2002:7). As a result of the moratorium on saccharine there is an indication that the concern regarding the safety of additives has declined in the USA, as indicated by a longitudinal study (ABT Associates Incorporated, 1997:78). Reduced consumer concerns plus a changing political environment away from consumerism and a move toward the more responsible use of additives by manufacturers have lessened the controversy over additive use.

The potential risks of food additives are well recognised, but the beneficial role that these additives play in food production, processing and utilisation are also felt to be essential to the maintenance of the current food system. With the convenient, tasty and nutritious foods desired by consumers and the increasing overall demand for foods as the population increases, food additives will continue to play an important role in food production. There will,

however, continue to be concerns regarding the potential risks associated with the long-term consumption of small amounts of these chemicals and the possible interactive toxicological effects. As evaluation methods for additives improve, more additives may be banned. At the same time, the same information may be used to develop safer new additives (Branen & Haggerty, 2002:8).

According to Meskin (quoted by Arthur, 2000:216), there are carcinogens throughout the food supply and there are also tremendous amounts of anti-carcinogens, in particular in fruits and vegetables. Consequently when one views this in context of a normal diet, one is simultaneously exposed to carcinogens and anti-carcinogens. Many consumers are afraid of low-risk hazards, such as possible negative consequences of eating genetically modified foods. In addition, the same consumers are not as concerned about high-risk hazards that scientists are sure of, such as microbial contamination or a shortage of food to feed the world (Arthur, 2000:216).

Consumers will accept a product if they perceive its possible risks to be small and if they think that the benefits outweigh its risks (Sloan *et al.*, 1986:527). Therefore, consumers' perceptions of the benefits and risks of food additives were investigated in the present study.

2.10 HYPERSENSITIVITY TOWARDS FOOD ADDITIVES

There are several foods and food additives that can cause both immunologic and non-immunologic reactions indistinguishable from each other. Among food additives, aspartame, MSG, sulfites, tartrazine, cinnamon and nitrogen are the most well-known causes of both allergic and non-allergic reactions to foods (FDA, 1994; Fraser *et al.*, 2000:241; Hannuksela & Haahtela, 2002:43; Wilson & Bahna, 2005:505). Hypersensitivity reactions (which include both allergic reactions and intolerance) to food additives in organs other than the skin or respiratory tract are rare and poorly documented (Rowe & Briggs, 1995:5; FDA, 1994; Hannuksela & Haahtela, 2002:63). Food intolerance includes food allergies and is a general term referring to a non-psychological, reproducible, unpleasant reaction to a specific food ingredient (Rowe & Briggs, 1995:5; Fraser *et al.*, 2000:236). According to Hannuksela and Haahtela (2002:63), many, if not most, of the adverse reactions to food and food additives are

in fact psychosomatic (emotional). Rowe and Briggs (1995:5) as well as Fraser *et al.* (2000:236) define food aversion as an unpleasant reaction to food, which is caused by emotions rather than by the food itself.

It is not possible to give a reasonable estimation of the prevalence of sensitivity to food additives in the general population (Rowe & Briggs, 1995:7; Fraser *et al.*, 2000:237). In a review of three papers estimating the frequency of food additive intolerances, the following was found:

- in the one study food additive intolerance was estimated to be 0.13% (Commission of the European Communities, 1982);
- in the Danish study the estimate for food additives in children was 1% (as quoted by Hannuksela & Haahtela, 2002:45); and
- the third study suggested the total prevalence of intolerance to any food additive to be 0.01%-0.23% in the whole population (Young *et al.*, 1987:246).

Thus, the adverse reactions to ingested food additives seem to be rare (Wilson & Bahna, 2005:499) and true allergies to them very rare (David, 2000:48; Lehrer *et al.*, 2002:81). Nevertheless, there is a small minority of the population who suffer from these reactions (FSANZ, 2005). These individuals revealed atopic conditions such as hay fewer, asthma or eczema (Young *et al.*, 1987:241; Hannuksela & Haahtela, 2002:45).

Self-diagnosis of a supposed "food allergy" is dangerous and can deprive adults and children of valuable sources of nourishment and even lead to deficiencies. Young (1997:112) found a discrepancy between the calculated prevalence of food additive intolerances and the consumer's perception of food additive intolerances. The rate of perception far exceeded the calculated prevalence rate. The consequences of this mistaken perception are considerable in terms of health and finance and also have social implications. If a food allergy, intolerance or sensitivity is suspected, then appropriate tests need to be conducted by medical experts to obtain a reliable diagnosis (Van Heerden, 2002:6).

It appears that regardless of the factors employed to ensure that food additive usage in the food supply is safe, certain population subgroups are susceptible to allergic and toxic manifestations of food components, including food additives. Children and diabetics are

population subgroups that are particular at risk of exposure to these undesirable manifestations (Salminen & Tahvonen, 2002:23). One solution for consumers who are sensitive to some food additives is to avoid them by reading food labels (FSANZ, 2005).

Consumers' hypersensitivity or perceptions about their sensitivity toward food additives are of significance to the present study. Consumers' risks perception (§ 3.3.1.2) about additives influences their consequent purchasing behaviour (Assael, 1995:251, Antonides & Van Raaij 1998:256; Hawkins *et al.*, 2004:542). For several years there have also been a number of concerns regarding the potential short and long-term risks of consuming food additives (Branen & Haggerty, 2002:6). The next section will focus on food additive intake assessment because some consumers might be sensitive to some food additives, or may be exposed to high doses of food additives.

2.11 FOOD ADDITIVE INTAKE ASSESSMENT

The major aim of food additive intake assessment is to protect consumer health and to assist in the development of regulations (Salminen & Tahvonen, 2002:11). Safety determinations of additive use should consider the effects of accidental or intentional consumption of a high quantity of an additive that is beyond its prescribed use level (Sumner & Eifert, 2002:32). Both international and local governments generally evaluate the safety of food additives. The objective of local assessment is to take into account the local food supply and cultural differences in dietary habits that may influence the intake of food additives. The four most widely used direct food additives which account for 98% by weight of all the direct food additives are sucrose, salt, corn syrup and dextrose (Roberts, 1981:6; Clydesdale, 1982:860; Vaclavik & Christian, 2003:203).

Toxicological (§ 2.8) principles for evaluating the safety of food additives have been developed by the FDA (FDA, 1993:3). The rationale of intake assessment is, therefore, to determine the likelihood and extent to which the acceptable daily intake (ADI) values may be exceeded. These values for each and every additive are determined by the FAO/WHO Joint Expert Committee on Food Additives and contaminants (JECFA) (Salminen & Tahvonen,

2002:12; EUFIC, 2004a:2). South Africa follows these guidelines because they are a member of the Codex Alimentarius.

The ADI value is not an exact figure or a mathematical value, but it gives an estimate of how much of a chemical can be relatively safely ingested daily by normal consumers. No special ADI is created for infants and children (Salminen & Tahvonen, 2002:12). The fact that no ADI for children is established creates an opportunity for consumers to be concerned about the amount of food additives consumed by children in their normal diet. Unfortunately the variation between the food additive intake of extreme and average consumers is difficult to determine (Salminen & Tahvonen, 2002:12).

Furthermore, an additive may be injurious to health when consumed in moderate dosages over extended periods of time. When the risks or benefits of food additives are considered, an estimation must be made about the long-term or lifetime consumption of the additive. These substances may have cumulative effects on health, may interact with other biological or chemical compounds in the body, or may elicit different responses in consumers of different ages or health status (Sumner & Eifert, 2002:32). Food additive assessment is so important that even additives derived from recombinant deoxyribonucleic acid (rDNA) biotechnology are assessed for safety before being introduced into the food marketplace (Anon., 2000:53).

In this study it was significant to determine consumers' perceptions about the safe intake of food additive because it might stimulate information search and information processing, which is in turn an important factor in consequent consumer purchasing behaviour (Assael, 1995:251, Antonides & Van Raaij, 1998:256; Hawkins *et al.*, 2004:542). Furthermore, this information could be used to improve legislation and to identify a lack in consumer education about food additives. The focus will now move to the regulation of food additives and how the benefits and risks of additive consumption influence these regulations.

2.12 REGULATION OF FOOD ADDITIVES

As indicated in the foregoing discussion it is essential that somebody must be responsible for taking the emotion out of the food debate and to set standards and regulations based on

scientific evidence. Various countries such as Australia, New Zealand, the EU and the USA applied this principle to food additives (Brooke-Taylor *et al.*, 2003:375). The authority of regulation, approval of additives and the monitoring of food additives are discussed in the next section.

2.12.1 Authority of food additive regulation

In SA it is the responsibility of the DOH and more specifically the Directorate of Food Control to establish and implement food additive regulations. SA is the 150th (Anon., 1995:93) member (§ 2.14.2) of the Codex Alimentarius. The Codex Alimentarius is the international body established in 1962 by the United Nation's Food and Agricultural Organisation (FAO) and World Health Organisation (WHO) to develop international food standards. Codex Alimentarius limits itself to issues that affect food safety and which could cause trade problems. The Codex Alimentarius has been designated by the World Trade Organisation (WTO) as the FAO/WHO's body for food safety determinations. Hence its standards, guidelines and codes of practice have far-ranging and critical impacts on the food industry. Codex Alimentarius has several committees such as the Committee on Food Labelling (CCFL) (Conover, 2004:208) and the FAO/WHO Joint Expert Committee on Food Additives and Contaminants (JECFA) (Petersen, 2000:16). Experts and specialists in a wide range of disciplines have contributed to every aspect of the code to ensure that its standards withstand the most rigorous scientific scrutiny.

As a member country, SA based its national regulations on Codex Alimentarius standards (Badham, 2000:3). Increasing international trade has resulted in improved nutrition, but also a greater probability for unsafe food to reach a large population. Because of this, food safety issues across the globe are getting more attention and this in turn has increased the visibility and importance of Codex Alimentarius by developing worldwide standards through scientific discussions by member countries (Murano, 2004:100). Food labelling regulations in SA are currently undergoing major changes. The motivating factors behind this new legislation are South Africa's renewed membership of Codex Alimentarius, progress made by food science and nutrition research and many loopholes that needed to be closed (Neall, 2002a:27).

There is a need to harmonize legal decisions about food additives on a worldwide basis as processed food products are exported to various countries throughout the world. Most likely these decisions will be specific to each country and depend on the perceived benefits, which may vary from country to country (Branen & Haggerty, 2002:9).

For legal purposes food additives in the USA fall into four categories:

- The food additives: this category covers substances not previously used in foods, or which do not have a proven track record of safety. An example of an additive that has been reviewed and approved is the artificial sweetener, aspartame;
- GRAS substances (§ 2.12.4): an example is salt;
- Prior-sanctioned substances. This includes substances that, prior to 1 January 1958, had been sanctioned for use in a specific food. An example is nitrites used in cured meat; and
- Colourants: this category includes dyes used and is subjected to pre-market testing (Weigley *et al.*, 1997:30).

In South Africa such categories are not described in the Regulation Relating to Labelling and Advertising of Foodstuffs (SA, 2007), but these USA categories is taken into account in the South African legislation.

Furthermore, the FDA separates food colourants into two categories:

- certified: these colourants are man-made derived primarily from petroleum; and
- exempt from certification: those colour pigments derived from natural sources such as vegetables, minerals, or animals and man-made counterparts of natural derivates (Duxbury, 2005:68).

In order for a regulating authority to permit the use of a specific food additive the use thereof must first be approved.

2.12.2 Approval of food additives

The FDA determines whether new additives intended to be used in foods will be permitted (McWilliams, 2005:571). The FDA also determines whether existing approved food additives

can be used in other food products or for new functions. Usually a food manufacturing company will ask the FDA to approve a new food additive's use through the submission of a new additive petition (McWilliams, 2005:571). The reason for filing petitions is so that the FDA can determine whether the new food additive under question is safe to use in the food and to maintain a data base for evaluation and monitoring these substances. Furthermore, the manufacturer must also provide evidence that the new additive will achieve its intended effects and that it is safe for human consumption (Sumner & Eifert, 2002:33).

The use of new food additives is sanctioned by the FDA only if the food additive falls within all five these criteria:

- perform a useful function;
- does not deceive the consumer by obscuring use of low-quality ingredients or poor manufacturing;
- does not reduce the nutritive value substantially;
- does not merely accomplish the same result that improved manufacturing techniques could provide; and
- can be measured in the product by a recognised method of analysis (McWilliams, 2005:571).

In the case of food colourants the certification process assures the safety, quality, consistency and strength of the colourant prior to its use in foods. Each colourant has chemical specifications that place restrictions on the levels of impurities allowed and ensure that the colourant contains no cancer-causing substances. The 1960 colourant amendment to the FD&C Act places colourants on a provisional list and requires further testing. In addition, the Nutrition Labelling and Education Act (NLEA) of 1990 requires certified colourants to be listed on the label statement. Today only seven food colourants are permitted to be used in food in the USA. They are: red number 3 and number 40; blue number 1 and number 2; yellow number 5 and number 6; and green number 3 (Thorngate, 2002:484; Duxbury, 2005:68).

2.12.3 Delaney clause

The 1958 legislation contained a highly controversial clause namely the Delaney Clause (FDA, 1992; Burdock & Carabin, 2004:4). This rather emotionally charged legislation requires that additives that induce cancer when consumed at any level by animals or humans cannot be added to foods. Cyclamates were banned in 1969 under the Delaney Clause (McWilliams, 2005:549). In addition, to the Delaney Clause, an additional food additive amendment (§ 2.12.4) was made to the FD&C Act. Because SA is a member of the Codex Alimentarius this clause is applicable in SA although the clause is not specifically mentioned in SA regulations.

2.12.4 Generally recognised as safe list

The 1958 **Food Additive Amendment** to the FD&C Act divided food ingredients into two categories, namely those that are GRAS (§ 2.2 & § 2.12.1) and those which are food additives (Burdock, 2003:17). A GRAS ingredient must have been used in food prior to 1 January 1958, or be found safe by scientific procedures. Scientific procedures usually mean animal and/or human safety studies. Any food ingredient that could not be determined as GRAS by the above criteria would automatically be classified as a food additive and would require the approval of the FDA prior to addition to food. If the ingredient was used prior to January 1st, 1958, it could not have been a drug or herbal remedy and must have been used by a significant number of people, to provide some assurance that at least most "less common" adverse reactions such as allergies or metabolic intolerances have been detected (Burdock, 2003:17). Although GRAS ingredients are not legally food additives, the public perceives no distinction between the two according to Sumner and Eifert (2002:37). The GRAS substances are excluded from the food additive definition (Schmidt, 2000:82) and thus not seen as food additives by legislation.

The next section deals with the monitoring of food additives. Unfortunately good food additive regulations as discussed above do not fulfill their function if they are not monitored by the responsible departments.

2.12.5 Monitoring of food additive labelling

Both locally produced products and imported food products must comply with the SA FC&D Act (SA, 1972) and its various regulations. Of particular importance for this study is the Regulation Relating to Labelling and Advertising of Foodstuffs, (SA, 2007). In addition, the Directorate of Food Control took a new approach to the establishment of food regulation in SA. In 1988 an advisory group made up of a wide range of interest and expert groups called Food Legislation Advisory Group (FLAG) was established. The main aim of this group was to provide advice on technical and scientific details regarding foods. Unlike other similar committees in other parts of the world, which are dominated by members of the nutrition and healthcare professions, FLAG consists almost exclusively of:

- members from the food and allied industries;
- academics;
- researchers;
- consumer institutions;
- members of the Department of Health;
- members of the Department of Agriculture;
- food industry associations such as the Grocery Manufacturer's Association (GMA);
- law enforcers;
- the SABS (South African Bureau of Standards); and
- other relevant associations such as the Association for Dietetics in Southern Africa (ADSA) and the Nutrition Society of South Africa (NSSA).

Furthermore, the Nutrition Committee (1994) has recommended that FLAG should be expanded to be representative of all stakeholders, which should include representatives of the trade unions to review and update existing legislation and to propose new legislation where required. This means that the law making process in SA is very inclusive. Unfortunately, the SABS, the Department of Agriculture and the Department of Trade and Industry, as well as the DOH in SA all have different standards on food. This makes it extremely difficult for food manufacturers, particularly the Small and Medium Enterprise (SME) sector to identify which regulations to apply to their particular food products. A spokesman for the food industry said the problem is not a lack of legislation on food safety but either the complexity of the

regulations or inadequate enforcement (Swanepoel, 2002:9; SAAFFI, 2005b:1). In addition, the Consumer Goods Council of SA (CGCSA) called a meeting to establish a unified food standards body in SA (SAAFFI, 2005a:1).

The president of the South African Association of Food Science and Technology (SAAFoST) as quoted by Anon. (2005b:3) confirmed the above-mentioned argument by indicating that one of the biggest problems in SA is that the enforcement of food legislation leaves much to be desired. In SA authorities that legislate foods are typically under resourced and often lack the technical skills to liaise effectively with food manufacturers. As described earlier, a further concern is the fragmented nature of food legislation in SA, with numerous bodies and government departments involved. SA needs a single food-control authority similar to the UK Food Standards Authority, but attempts to move in this direction have been stalled in bureaucratic inertia for more than 10 years. Sunley (Anon., 2005b:3) also indicated that it has taken investigative journalism rather than routine law enforcement to highlight the problem of Sudan Red, an illegal colourant, in SA. Sunley (Anon., 2005b:3), furthermore, argues that the Sudan Red episode, however regrettable, should serve as a much-needed kick-start to improve the situation of food control in SA.

The CGCSA work closely together with the DOH as could be seen with the resent ban of the food additive Sudan Red in SA (Anon., 2005a). The CGCSA is the umbrella body in which the fast moving consumer goods (FMCG) industry works together in establishing best practices, implementing global standards as well as cooperating in crime prevention and legal and regulatory issues (Anon., 2005a).

Similar to SA, Federal Regulations in the USA are in place to determine whether an additive is safe and effectively fulfills its functions as it is prescribed. Also, regulations may stipulate the permitted food uses or usage levels for food additives. Nevertheless, the usage and labelling of food additives may be monitored through analytical testing and label review of finished products or ingredients (Sumner & Eifert, 2002:31).

An overview about the regulation of food additives is important because this information could assist in the interpretation of the empirical data of the present study. Furthermore, it is

used to understand the consumers' perceptions about food additives and food additive labelling regulations in SA. In spite of the legislation and regulation that are in place to protect consumers from fraudulent practices by producers, manufacturers and the retail industry, consumers have particular perceptions about food additives and the regulation thereof as indicated in the following section.

2.13 CONSUMER PERCEPTIONS OF FOOD ADDITIVES

Consumers have many complex perceptions about the food and beverages they consume. The consumer in general has not progressed a great deal when it comes to the perceptions and beliefs they have about foods, more specifically food additives (Van Heerden, 2002:1). Changing needs and lifestyles, the link between diet and disease, dietary guidelines and media attention have stimulated interest in food, nutrition (Richardson, 1990:188) and food additives. Trends in society also have an influential effect on consumer choice and demand for "healthy" and additive free foods (Shine *et al.*, 1997a:283). This is in line with the avoidance behaviour of consumers which is accelerating currently. Furthermore, products that are free of undesirable ingredients such as food additives (Crawford & Baghurst, 1990:232) are moving to the centre stage (Sloan, 2007:32). Consumers believe that food and nutrition play "a great role" in maintaining or improving overall health (IFIC, 2006b:5).

Life expectancy has increased and consumers want to lead an active and healthy lifestyle. Healthy living, coupled with the benefits of exercise, a healthy diet and the reduction of food additives are continuously stressed by experts in the fields of nutrition and medicine (Shine *et al.*, 1997a:283). This has caused concern amongst consumers, motivating them to become even more aware of their dietary requirements (Shine *et al.*, 1997a:283). Thus consumers have very specific perceptions about food additives fuelled by their viewpoints about food additive safety concerns (Prättälä *et al.*, 1985:243; McNutt *et al.*, 1986:75; Kajanne & Pirttilä-Backman, 1996:217; Bruhn, 2002:102; EUFIC, 2004b:1, Williams *et al.*, 2004:32) and misconceptions concerning food additives (Prättälä *et al.*, 1985:243; Kajanne & Pirttilä-Backman, 1996:217; EUFIC, 2004a:1, Williams *et al.*, 2004:32). Food and nutrition

misinformation can have harmful effects on the health, well-being and economic status of consumers (Wansink, 2006:601).

2.13.1 Origin of erroneous food additive perceptions

Nowadays one would expect that most consumers who have access to basic education would know something about food and its relationship with good health. However, many consumers are confused about what constitutes a healthy diet and what food products and foods are harmful (Van Heerden, 2002:2). Some concerns about additives may be due to a lack of general public information about these substances (Wandel, 1997:219).

Concern about food additives is directed towards synthetic rather than natural additives (Fraser, 1993b:34; Kajanne & Pirttilä-Backman, 1996:214; Bruhn, 2002:102; Anon., 2004:23). Sloan *et al.* (1986:523) found that consumers define the term natural as "food without additives". Concerns about additives amongst Finish consumers also related to perceptions of nature or natural processes. When Finish men spoke of additives, they discussed industrial poisons, fertilizers and pesticides (Kajanne & Pirttilä-Backman, 1996:219), whereas USA consumers defined natural as food without additives, or no artificial or synthetic ingredients or free of chemicals. Additionally 71% agreed that natural foods are always better for one than processed foods (Sloan *et al.*, 1986:523; Bruhn, 2002:102). In various studies it was found that concerns about additives were related to a general fear of chemicals and diseases, especially cancer (Prättälä *et al.*, 1985:240; McNutt *et al.*, 1986:75; Sloan *et al.*, 1986:524; IFT, 1988:119; Abbott, 1992:328; Rowe & Briggs, 1995:5; Bruhn, 2000:6; Paterson, 2002:4; Williams *et al.*, 2004:35).

Finnish consumers indicated a lack of trust in regulators and regulatory procedures (Kajanne & Pirttilä-Backman, 1996:207). This concern was believed to be justified since some approved additives were later withdrawn. Roberts (1981:2) speculated that the problem with the public perception of food ingredients is that these food borne substances must be proven "safe". It is impossible to ensure the complete safety of any substance for all human beings under all conditions of use. Therefore, any uncertainty about the safety of food additives can result in the consumer suspicion of a much greater risk. Equally important, some consumers

view food additives and certain GRAS ingredients as unnecessary and involuntary sources of risks. As mentioned before, the benefits of these food ingredients are not widely appreciated. Since additives can increase both the quantity and the quality of foods, they will always be used. Therefore, the FDA must continue to review the use of food additives in order to assure the public of the safety of food additives (Sumner & Eifert, 2002:38).

Furthermore, food allergies may also be a concern as some consumers believe additives can result in allergic reactions (Sloan *et al.*, 1986:524; Fraser, 1993b:38; Wandel, 1997:214; Taylor & Hefle, 2005:40). Twenty six percent of USA consumers said they feared an allergic reaction to artificial ingredients (Good Housekeeping, 1984). Similarly, Australian and Finish consumers give the main reason for looking for food additives on food labels as allergies (Prättälä *et al.*, 1985:240; Crowe *et al.*, 1992:20; Bruhn, 2002:102).

Consumer response towards food additives can also be related to perceived food quality (Bruhn, 2002:102). Almost three quarters of consumers indicated that artificial flavourants give food a poorer taste than natural occurring flavourants (Zibrik *et al.*, 1981:49; McNutt *et al.*, 1986:76). In 1978 almost 80% of Canadian consumers thought that food colourants were unnecessary and believed additives make foods less safe (Zibrik *et al.*, 1981:49). Sloan *et al.* (1986:531) believe that consumers will accept a product if its benefits outweigh its disadvantages and possible risks are small. Acceptability of food additives can be influenced by terms used in the food manufacturing industry and regulators. McNutt *et al.* (1986:77) found that terms that connote approval by an official body, such as USA Certified or FD&C Act were moderately acceptable by consumers.

2.13.2 Factors contributing to food additive misconceptions and confusion

Although misconceptions about food additives can originate from a variety of different sources, there are four main contributing factors that can augment these misconceptions:

2.13.2.1 Conflicting messages

Contradictory messages from different experts in the field of food additives can confuse consumers (Kajanne & Pirttilä-Backman, 1996:208) which may lead to incorrect food choices. Tartrazine is an example where scientists and the FDA sporadically disagree about its safety (Thorngate, 2002:497). Prior held knowledge does not change easily (Van Heerden, 2002:2), therefore, experts should take all possible precautions not to mislead the consumer because it would be difficult for consumers to change their perception about an additive once it is formed. Simultaneously, consumer's prior knowledge has to be adapted as more technologies (such as edible barcodes printed on food and edible colour glitter) and scientific research methods become available (Van Heerden, 2002:2). Moreover, it is the position of the American Dietetic Association that experts must accurately identify and counter food and nutrition misinformation and not contribute toward it (Wansink, 2006:603).

2.13.2.2 The rapid rate of change of knowledge

At no other time in history has knowledge changed as rapidly as at present (Van Heerden, 2002:1). What is a proven fact today may be outdated tomorrow. Instant transmission of information via electronic media resulted in food facts, myths and preconceptions that are flashed around the world in days if not in hours. At such a rapid rate of information dissemination consumers do not have a chance to assimilate the food additive facts or come to rational conclusions (Van Heerden, 2002:2) as was the situation with Sudan Red (Anon., 2005b:3; Knowles *et al.,* 2007:50).

2.13.2.3 The influence of the media

The influence of the media was discussed before (§1.2)

2.13.2.4 The influence of self-seeking manufacturers and retailers

Sometimes marketers make use of fear tactics or fear appeals to sell their products (Shimp, 1997:290; Hawkins *et al.*, 2004:405; Solomon, 2004:276). Certain retailers and manufacturers use negative advertising to boost sales of their products at the expense of the truth. "MSG-free" labelling serves as an example to illustrate how food additives can be used to boost sales and at the same time it does not assist the consumer in their pursuit to avoid MSG completely. This is because such a product may contain naturally occurring MSG. Furthermore, manufacturers can also make use of misinformation to increase the sales of their products. Food producers make claims and statements (such as "no artificial preservatives") that imply that their products are superior or healthier than similar products produced by rival companies (Van Heerden, 2002: 2).

As illustrated, consumers have many misconceptions about a variety of food additives. In the next section the concept of "natural" and "MSG" will serve as examples to explain consumer's misconceptions about food additives.

2.13.3 Examples of food additive perceptions

The researcher selected MSG as an example to describe consumer perceptions because it was the only food additive study done in SA from a consumer point of view. Furthermore, the researcher focused on natural compounds because consumers have specific opinions and perceptions about the nature of ingredients used in foodstuffs.

2.13.3.1 Monosodium glutamate

MSG or E 621, a flavour enhancer (Proudlove, 1990:70), is a widely misunderstood and actively feared ingredient by many consumers (Van Heerden, 2002:3). In 2001, the Glutamate Advisory Council of SA (GACSA) commissioned a study on MSG perceptions among South African consumers (Van Heerden, 2002:3). These consumers believe that MSG cause hyperactivity and Attention Deficit Disorder (ADD), migraine, headaches, sickness and is

detrimental to your health (Van Heerden, 2002:3). However, 86% of the respondents admitted to purchasing convenience food in dried powder form such as instant soup, despite the fact that it contains MSG and is regarded as "not good for you". In addition, they did not actually know what MSG is and what is does in the human body. The media and word-of-mouth were listed as the prime sources of information on MSG and its purported "bad" effects. Many respondents stated that Woolworths, an exclusive food retail outlet, were adding to the negative perceptions of MSG by highlighting some of their products as containing "no added MSG". This claim was interpreted as meaning free of MSG (Van Heerden, 2002:3).

The main concerns about MSG listed by the South African consumers were that consumers were mislead into believing that a product labelled with "no added MSG" which may contain high levels of glutamate derived from hydrolyzed soy, tomatoes or mushrooms, is safe and can be used by glutamate sensitive individuals. Another concern was that the food industry was creating the impression that MSG is "unsafe" when most consumers are not sensitive to MSG. and that they were fuelling public hysteria instead of providing scientifically proven information (Van Heerden, 2002:3).

According to Van Heerden (2002:16), 30% of the SA consumers believe that they are allergic to some or other food, less than 2% suffer from proven food allergies, and only a fraction of these consumers are sensitive to MSG. In Australia and New Zealand it is estimated that less than 1% of the population is likely to be affected by MSG (FSANZ, 2002).

2.13.3.2 Natural compounds

While there is continued pressure from consumers and consumer interest groups for the food industry to produce foods that are preservative-free or additive-free, food additives continue to play a major role in nutrition and the sensory quality and safety of foods produced world-wide. Some food processors even market food with "green" labels when containing fewer food additives. This has driven food processors to examine natural compounds as food additives (Branen *et al.*, 2002:vi). Consumer reactions to the inclusion of artificial additives may be more emotional than rational, especially where side effects are limited, as indicated by Young *et al.* (1987:246). All-natural additive and preservative-free products are a significant

trend regaining momentum (Sloan, 2003b:31). For example, natural sweeteners (Sloan, 2004c:20) enjoyed a 35% sales gain in 2003. The desire of consumers to avoid anything artificial continues to grow. At the same time the concern over purity, quality and chemical-free continues to bring about a wide range of new products of premium quality (Sloan, 2003a:48; Sloan, 2004b:31).

Consumers' perceptions about food additives are formed and influenced by the information to which the particular consumer is subjected. The food label is one type of such an information source and the next section will focus in particular on food additive labelling and various issues concerning food additive labelling.

2.14 KEY ISSUES IN FOOD ADDITIVE LABELLING

Consumers' current awareness, utilisation and apprehension about food labelling are linked to the increasing sale of food in prepackaged form (Jukes, 2000:1). In addition, the trend towards healthy eating has emphasised the importance of food labelling to the consumer. This in turn has led to an increased comparison and evaluation of food products by using the food label presented on a product. The increased variety of food products that are available to consumers for purchase and consumption resulted in an increased demand for information about the nutritional and additive content of food. Food labels allow consumers the opportunity to make carefully considered and informed food choices (Abbott, 1997:44; Shine *et al.*, 1997a:248; Wandel, 1997:212). Thus, food labelling is the one information medium through which consumers can acquire knowledge about the food they consider purchasing (Tansey & Worsley, 1995:154; Shine *et al.*, 1997a:284; Wandel, 1997:212; Wright, 1997:417; Dimara & Skuras, 2005:96; IFIC, 2006a:2). However, in order to be useful, the information must deal with those aspects of most concern to the consumers, and it should be formulated in such a way that they understand and use it (Wandel, 1997:212, 217; Flowerdew, 2000:65) to make informed choices (Tessier *et al.*, 2000:36). In particular, consumers search for information about ingredients, nutritional value and food additives to make it easier for them and their families to make healthier food choices (Humphries, 1998:193; Satia *et al.*, 2005:394).

Food labels should give the consumer information about all the main ingredients used in food as well as additives added (Wandel, 1997:212; Flowerdew, 2000:65). All information given on a label must be easy to understand, clearly legible, permanent and conspicuous to the purchaser at the point of sale. Information should not be hidden, obscured or interrupted by irrelevant writing or pictures (Humphries, 1998:193; Flowerdew, 2000:70). Thus food labelling is one aspect that could potentially influence the food choice and hence the composition of the diet of consumers and improvement of health (Tessier *et al.*, 2000:25).

Consumers reading ingredient information on food labels of many processed and prepared foods in the market today seem to have developed a wide range of emotions. These emotions range from embarrassment of not being able to pronounce the chemical names to utter panic about the perceived hazards of the unnatural chemicals used in the food supply. In general, consumers still believe that all menu items can be prepared with basic ingredients at home, which would reduce their intake of food additives. However, many consumers buy convenience and other processed food items to save time, to improve food quality, to save energy or for other reasons (McWilliams, 2005:548).

As can be seen from the above discussion the aims of labelling foodstuffs should be to:

- provide information to the consumer;
- protect the consumer; and
- promote fairness in trade (Przyrembel, 2004:361).

Jukes (2000:1) adds another aim of food labelling but from a marketing point of view, namely that the label must help to sell the product.

These aims are interrelated and, therefore, the one cannot be achieved without the other. The correct information on the identity, nature and composition of the food should prevent the consumer from making choices which are inappropriate for a healthy diet and should guarantee equal opportunities for the marketing of comparable foods (Przyrembel, 2004:361). As suggested by these aims, the label provides the consumer with information. The second aim is coupled with the primary concern of early food regulators to uncover fraud and deception with regard to concealing the presence of unsafe food ingredients, or misleading the consumer by improper label declarations. As industrial food technology advanced,

innovations evolved to expand, extend and improve or to imitate existing food products. The development of new functional food additives and preservatives brought about additional concerns to food safety and label disclosure. Likewise, the development of substitutes and/or imitations of traditional foods brought concerns that these products may be of lower functional and nutritional quality than traditional foods (Schmidt, 2000:81).

2.14.1 Regulation and monitoring of food additive labelling

As mentioned before the regulation used in SA for food labelling is the Regulation Relating to Labelling and Advertising of Foodstuffs (SA, 2002) as established by the DOH. The final draft of the new regulation was published on the July 20th, 2007 (SA, 2007) for comments by industry and the public. This regulation is, in some respects, ahead of many developed countries' labelling laws. In addition, the new legislation will enable food manufacturers to create awareness among consumers of good nutrition and health as well as the prevention of chronic lifestyle diseases (Anon., 2005c:15). Unfortunately it will take some time before the new regulation will be finally promulgated.

The declaration of ingredients and additives must fulfill the following criteria according to the South African regulation (SA, 2007):

- be in at least one official language of SA;
- clearly visible, easily legible and permanent and the labels of packaged foodstuffs shall be applied in such a manner that they are not separated from the container;
- not less than 1mm in height of the smallest letter;
- the listing of ingredients and proportions of ingredients shall be in type of uniform size and prominence throughout and the initial letter of a word may be larger than the letters of the rest of the word; and
- the list of ingredients required by regulation 20 and 24 (§ 2.14.5.1) as applicable to food additives.

The ingredient list is required on all foods that contain one or more ingredient. If the usual name of a food ingredient may be obvious, for example, salt or sugar it may be used instead of the scientific name, for example, sodium chloride or sucrose (Schmidt, 2000:88). The list must be headed with the word ingredients or a phrase that includes this word (Flowerdew, 2000:66).

Additives are substances that are not normally used as food or as characterising ingredients in themselves, but which are used for a technological purpose during manufacture and processing and may, therefore, become components of the final product. Thus consumers are aided in knowing what they are eating by the legal requirements for ingredient labelling on all food packages (Flowerdew, 2000:69; McWilliams, 2005:570). Additives may occur in several positions, interspersed amongst other additives and non-additive ingredients. In cases where several different additives with the same function/category occur in the same foodstuff, the ingredient list will have to mention it several times and at different positions in the ingredient list. In addition, the risks or benefits of food additives and ingredients should be clearly displayed for consumers (Verbruggen, 2002:138).

According to the regulations 26, 27 and 28, 41, 42 and 43 (SA, 2007), SA food additives must be labelled as follows:

- any additive which is added to or used in a foodstuff to perform the function of one of the categories of ingredients as listed in the regulation may be indicated on a label by the name of the category and if an additive is added to or used in a foodstuff to serve more than one such function, it shall be indicated by the name of the category that represents the principle function performed in that foodstuff;
- any additive, except those referred to in the annexure of the regulation shall be indicated on a label by its usual chemical name;
- no person shall sell any foodstuff containing the colourant tartrazine (E102 or yellow no 5) unless the word "tartrazine" appears in the ingredient list;
- preservatives that are used as anti-oxidants shall be indicated by the usual chemical name in the list of ingredients.

Spices may be listed in the ingredient list by their specific usual name or may be listed as "spices". Similarly, flavour additives from natural sources may be specifically listed in the ingredient list by their usual name or by the terms: flavour; flavouring; natural flavour; or natural flavouring. However, if the substance is classified as a flavour enhancer, it must be listed specifically by the usual name. Artificial flavourants used in a food product must be declared on the ingredient list as 'artificial flavour' (Schmidt, 2002:92).

The exemption from the ingredient declaration for incidental additives has come under attack by consumer groups who require more complete disclosure. Examples of controversial incidental additives are the sulfating agents (for example, sulfur dioxide, sodium sulfite), used primarily as antioxidants to prevent or reduce enzymatic browning of fruit. Sulfite sensitivity results in a wide range of especially asthmatics symptoms and can be life-threatening in severe cases (Schmidt, 2000:94).

Sweeteners are additives that must be indicated by the expression 'with sweeteners', and if sugar and sweeteners are used, both must be included in the ingredient list. Where aspartame is used, a statement must be made that the product 'contains a source of phenylalanine' and a food containing more than 10% polyols must bear the warning statement 'excessive consumption may produce laxative effects' (Flowerdew, 2000:70).

2.14.2 Food additive label claims

Manufacturers use label claims or statements and symbols to communicate valuable information about their product's benefits to consumer (Dziezak, 2002:49; Carneiro *et al.*, 2005:275). Thus, claims focus the attention on one or more special properties of a product that usually relate to good health (Anon., 1996:9). In order to understand what is exactly meant by a "claim" it is necessary to consider the definition of a "claim". According to the Regulation Governing the Labelling and Advertising of Foodstuffs, (SA, 2007) as set out in the FC&D Act, (SA, 1972) for SA, a claim is defined for legal purposes as:

"in relation to a foodstuff or nutrient supplement, means any written, pictorial, visual or other descriptive matter or verbal statement, communication, representation or reference

brought to the attention of the public in any manner including trade name or brand name and referring to the characteristics of a product, in particular to its nature, identity, properties, composition, quality, durability, origin or method of manufacture or production".

Furthermore, certain statements pertaining to food additives are prohibited by the regulation (SA, 2007) as set out in the FC&D Act (SA, 1972) of SA. The regulation states that:

" a claim that a foodstuff is free from a particular substance if all other foodstuffs in the same class or category are free from such substance, unless the claim complies with regulation 60, and the claim is worded as follows 'A (name of the nutrient) free food' or 'a naturally (name of the nutrient) free food."

Negative claims are describe in the South African regulations, and "free claims" are permitted (SA 2007:20-21). Negative labelling claims are found where food processors wish to declare that products do not contain certain ingredients (Schmidt, 2000:99; Williams *et al.*, 2004:36). "MSG-free" claims (also known as negative claims) are permitted under the FSANZ laws, provided they are not false, misleading or deceptive (FSANZ, 2002), but it discourages the use of claims such as "no preservatives" (Williams *et al.*, 2004:37). In addition, the FDA informally addresses such label statements and allows them only when they are not false or misleading, but has not promulgated negative labelling regulations. Examples of allowed negative labelling or claims include 'no artificial anything'. In contrast, terminology such as 'chemical free' or 'no chemicals' is not allowed on food labels (Schmidt, 2000:99).

Not all statements about nutrients are "nutrient content claims". Statements such as "no preservatives", "no artificial colours" and "no caffeine" are statements of fact, referring to substances and have no nutritive value. Other statements about the absence of an ingredient are used to help consumers avoid that particular ingredient because of allergies, sensitivities, religious beliefs or dietary preferences (Dziezak, 2002:49; FSANZ, 2005).

Food suppliers have resorted towards claims of nature in order to attract consumers. Examples such as recourse to nature occur in claims of natural colourants, as in jams and concentrated cordials or squashes which need dilution before drinking. Claims to a flavour do not have to

state that the flavour was derived from a specific source, for example, strawberry flavour may be synthesised and not obtained from strawberry fruit (Wright, 1997:423). In SA the regulation prohibits the use of the word natural on food labels (SA, 2007). Consumers seem to think that the absence of chemical additives makes that product more natural. According to Sloan *et al.* (1986:523), consumers define the term natural as food without additives, no artificial/synthetic ingredients and free of chemicals/ not chemically treated.

2.14.3 Consumer needs regarding food additive labelling

The label provides the consumer with the essential means of making an informed choice when purchasing a product (§ 2.14.). Table 2.1 shows the frequency that South African consumers utilise food labels (ACNielsen, 2005b).

Table 2.1 Regularly check labels for contents: global and South African averages (ACNielsen, 2005b)

Contents	Global average	South African consumers
Sugar	42%	43%
Salt	18%	26%
Preservatives	40%	44%
Colourants	36%	43%
Food additives	36%	43%

Consumers worldwide are screening out products containing ingredients they consider to be unhealthy, and they make their own personal decisions about the levels of additives. In developing markets, consumers appear to be more concerned about additives than they are about kilojoules. In developed markets consumer focus is on products that make them gain weight and may reflect the obesity battle being faced in a number of these markets (ACNielsen, 2005a). Consequently it is important to label food in such a way that consumers can easily determine whether a product has an ingredient or additive that may be hazardous to their health (Silverglade *et al.*, 1998:22). Since consumers are becoming more health

conscious, correct labelling represents a valuable tool for health professionals in planning and carrying out health education in order to reduce nutrition-related diseases (Anon., 1996:9). European and Asian consumers have the highest concern about checking food labels for preservatives and additives (ACNielsen, 2005b). Women, the highly educated and those who are on special diets tend to read the food labels to a greater extent than others. According to the latest available scientific information, the typical food label reader is a middle-aged woman with high level of education (Wandel, 1997:213).

Participants who make use of food labels in a study done by Tessier *et al.* (2000:38) indicated that they are looking for (in order of importance) the use-by-date, kilojoules, additives and the ingredient list. Apart from the information that a label provides to consumers, they also want a label that is trustworthy and that does not misinform them.

2.14.4 Manufacturers' needs regarding food additive labelling

The label is the principle means of selling a product as well as conveying information about it to manufacturers. Therefore, manufacturers need to be able to present their products distinctively as well as attractively and to communicate their product on the label in an understandable manner (Hunt, 2000:13; ACNielsen, 2005b). Manufacturers' decisions to provide information on a food label are potentially complex, due to not only the legal requirements but also the interpretative aspects of applying some of these requirements in practice (Hunt, 2000:13). The manufacturer of the product wants the label primarily to help sell the product. Simultaneously, the manufacturer also needs to ensure that the label complies with the law. This may lead to internal competition, not only for space on the label but about what is written and how it is presented. This usually results in a compromise that meets both requirements (Blanchfield, 2000:xi). Lastly, the manufacturer is responsible for assuring that the listing on the label is not in any way false or misleading (Schmidt, 2000:85). It is clear from the labelling objective of manufacturers that it focuses on selling the product within the parameters prescribed by the law. The literature (§ 2.14.3 & 2.14.5) indicated that there is a discrepancy between the wants and needs of consumers and food manufacturers and processors. It is questioned in the present study if the label information about food additives provided by manufacturers addresses the needs and wants of consumers.

2.14.5 Consumer perceptions of food additive labelling

North American consumers are the most knowledgeable about food labelling, with 65% of the respondents claiming that they mostly understand the nutritional information on a food package (ACNielsen, 2005b). Wandel (1997:213) found that some Norwegian consumers want to know what food products contain. Consumers conveyed a diffused uncertainty towards additives in the foods. Many consumers explained that they did not know what the E-numbers that indicate the additives meant (Wandel, 1997:213). This was a matter of concern to them. In contrast, Abbott (1997:45) found that participants in his study had good levels of knowledge about the meaning of E-numbers (65.5%), although 28.5% regarded E-numbers as food additives that often cause allergies and other reactions. Consumers suggested that the E-numbers should be replaced or supplemented with chemical names on the labels.

Consumers are reported to be doubtful about claims such as "no additives" on labels. About 50% stated that they would not necessarily believe claims, 40% admitted that they were confused by claims, and seven out of ten stated that they would be more likely to believe claims on the pack if they trusted the manufacturer or shop from which they were buying (Drew, 1990:12). When selecting "healthy foods" an additive free claim was important to 35% of consumers (FMI, 2006b:34). Consumer concerns about food labels were grouped into seven categories by Humphries, (1998:194). The categories were: the small print, the half truth, the hidden truth, the bluff, rose-tinted spectacles, weasel words, and the illusion. According to research few consumers look at labels at all (EUFIC, 2005:3). When they do, ingredient information is rarely read unless the person has a specific condition such as diabetes or food related allergies (Tessier *et al.*, 2000:36). It is also common that the consumers confuse the ingredient list with the nutrition label.

2.14.6 Consumers' understanding of and ability to use food additive labels

Terminology used on labels should convey information in an understandable, accurate and non-misleading manner (Conover, 2004:208). Food labels should give consumers information about all the main ingredients put into the food, as well as additives and condiments. There

are data to indicate that a large proportion of consumers do not have enough knowledge to be able to take full advantage of the information provided on food labels (Shannon, 1994:43; Wandel, 1997:214). Many consumers have difficulty when trying to understand the information provided on the label and could not correctly identify food additives (Crawford & Baghurst, 1990:231; Abbott, 1997:47; Wandel, 1997:213; ACNielsen, 2005a; ACNielsen, 2005b). The consumers in a study in Norway indicated that the terminology on the label appears to be technical and very advanced to them (Wandel, 1997:213). A need for simplification and less information on the label has also been pointed out (Shannon, 1994:44; Wandel, 1997:214; EUFIC, 2005:4). Sunley (2007:12) argues that there is a mass of disjointed and often flamboyant nutrition and health information on food labels and that even scientists often fail to comprehend it and consumers are overloaded with information.

Consumers deal with these problems in various ways. Some consumers read or make use of the labels to a very limited extent, or not at all. Consumers indicated that reading labels took too much time or was too cumbersome. Another explanation was that consumers did not have enough interest to go to the trouble of acquiring enough knowledge in order to be able to use the information provided on the labels successfully. Others focused only on a relatively small part of the information given on the labels that they found easier to understand. Some consumers indicated that they only take note of the label information when encountered with a new product (Wandel, 1997:213). On the other hand, many consumers want a more detailed and complete list (Wandel 1994:204; Abbott, 1997:45, 47; Bruhn, 2002:103). There is a dilemma between the urge to meet consumers' demand for more detailed and complete information and the wish not to make the list so long that it will have a deterrent effect on the consumers (Wandel, 1997:212).

Consumers must be able to read any information on the label clearly. Information is printed too small or too dark which makes it illegible which may mislead the consumer (Fraser, 1993a:23). In general, today's health conscious consumers are more demanding than previous generations with regard to ingredient declaration. Furthermore, complete ingredient declaration is needed by consumers with restrictive diets, because of allergies to certain ingredients. In recent years, ingredient labelling requirements have been modernised to meet these consumer demands (Schmidt, 2000:81).

Consumers reported in a study by Crawford and Baghurst (1990:232) that they use the information on food labels to avoid a particular ingredient or nutrient, or to avoid getting to much of it. Preservatives, additives, 'chemicals' and sodium were the substances most commonly cited as those consumers attempted to avoid. There is no doubt that food labelling is extremely confusing to most of the consumers and that current food labelling systems are not fully understood by even highly educated consumers. There is wide consensus that better, clearer labels are important to ensure that consumers can quickly and easily identify those foods that contribute to a healthy diet.

According to Neall (2005:7), the truth is that there is no "silver bullet" answer to the search for the ideal food label. Consumers in one study requested information on the functions of individual additives and the side effects related to human consumption (Bruhn, 2002:103). Contradictory to this Abbott's (1997:45) study indicated that 44.8% of the consumers wanted simpler words to be used on food labels, whilst 35.5% of the consumers wanted less information to be displayed as numbers. Only 14.5% said that the labels can stay the way they are. Abbott (1992:330) and Satia *et al.* (2005:392) found that one of the strongest predictors of consumers' use of labels was consumers believing in the association between diet and cancer. Neuhouser *et al.* (1999:45), however, found that consumers with a history of chronic cancer were not more likely to read nutrition label than a healthy person.

As mentioned before the food label is a major source of information to consumers. In the next section other sources of information available to consumers about food additives will be investigated.

2.15 SYNOPSIS

Food additives are a substance of mixture or substances other than a basic foodstuff that is present in food as a result of an aspect of production, processing, storage, or packaging. Additives functions in foods are to combat microbial and enzymatic deterioration, to maintain or improve nutritional value and product consistency, and to make food more aesthetically

appealing. Less rancidity, spoilage, contamination and overall waste, and more nutritional value and easier preparation are possible with the use of additives. In the initial stages of food legislation, the primary intention was to eliminate fraudulent practices and adulteration of foods. Since the first half of the previous century the weight of legislation shifted to the prohibition of misleading consumers and assuring the quality of food categories. Another shift in food legislation at the end of the last century was towards informing and even educating consumers via labelling.

It may not seem important to be making and changing regulations continually, especially those that relate specifically to food, but with so many new developments in food production technology and manufacturing, it is the only way to keep laws up to date and to ensure the safety and health of the consumers. This is especially important in the case of food additives. Similarly labelling policies must be dynamic if they are to keep up with modern technology and to meet the increasing demands of consumers. Furthermore, in order to optimize the usability and understanding of food labels, the label must be continuously reviewed and improved.

Many consumer fears about food additives stem from an inability to understand them, but the fact that food additives are strictly regulated should be a reassurance. The majority of food is pre-packed and presented to the consumer in a labelled container. The focus of the consumer's food choice is, therefore, on the label. Unfortunately the food label is increasingly subjected to detailed demands, analysis, abuse and subsequent control.

Food labels are viewed as an important source of information to the consumers. Consumers want labels to be clear and informative to allow them to make informed purchasing decisions. In other words access to complete and useful food additive information addressing consumers' health concerns can be empowering for the health conscious consumer. For example, when preparing an ingredient list the general rule is that all ingredients of the product must be declared in descending order of predominance. Finally, as is the case with every aspect of a food label, the ingredient list must not be false or misleading in any particular way.

Consumers are confronted with a vast variety of products on the supermarket shelve. Faced with these different products, the consumer has to make a decision about which product to purchase. Whilst marketing requires the freedom to promote the particular benefits of a food item, the consumer needs to be able to take decisions based on comparable information. However, consumers' reasons for choosing one food product over another will relate to their own perceptions and needs. Some consumers will be looking for information about nutrition, whilst others may have safety concerns about food additives. Therefore, the next chapter discusses the process on how consumers' perceptions are formed when consumers are subjected to food information. Furthermore, it focuses on the consumers' decision-making process and consequent purchasing behaviour by scrutinising various consumer decision-making models available in the consumer behaviour literature.

CHAPTER 3

INFLUENCE OF PERCEPTION ON DECISION-MAKING AND PURCHASING BEHAVIOUR

3.1 INTRODUCTION

The focus of this chapter is the process through which consumers form impressions of products in their environment. It defines perception and identified elements of the perceptual process in order to understand how consumers form perceptions about food additives. Conceptual knowledge of how consumers select products containing food additives and perceived communication can result in improved health messages designed by marketers and consumer educators (Rousseau & Spoelstra, 2003:217). Furthermore, perception is important because it affects what consumers comprehend and what they remember. This information in turn, affects the decisions consumers make (Hoyer & MacInnis, 2001:81) and their consequent purchasing behaviour (Hanna & Wozniak, 2001:197) about products containing food additives.

Consumers are influenced by internal (individual psychological or physiological) and external (social) forces to make purchasing decisions (Hawkins *et al.*, 2004:26, 30). These forces cause consumers to realize that they need or want something. Internal forces are those that arise primarily due to the individual consumer responding to their own personal perceptions of the specific circumstances that affects them. External forces are those arising from society and include culture, social class and reference group. However, external forces fall beyond the scope of this study because perception is an internal force (Hawkins *et al.*, 2004:29; Cant *et al.*, 2006:24). Consumers may not be aware of how their needs have been shaped by the internal and external forces. Consumers may hold their needs dormant until something arouses or activates these needs (Hawkins *et al.*, 2004:355; McNeill & Crotts, 2006:55). Then, when a motive arises (such as to avoid tartrazine due to a hyperactive child), the consumer exhibits those needs as behaviour. This behaviour is intended to satisfy that need (McNeill & Crotts, 2006:55), for example, when a consumer purchases a food product

bearing a "tartrazine free" claim. Furthermore, consumers act and react on the basis of their perceptions and not on objective reality (Sheth *et al.,* 1999:298; Sheth & Mittal, 2004:129). Rousseau and Spoelstra (2003:217) argue that consumers' perceptions (such as saccharine causes cancer), are more important to marketers than consumers' knowledge of objective reality (such as saccharine may cause cancer in animals), because perceptions affect consumers' purchasing behaviour.

The aim of this chapter is to show the relevance of consumer perceptions to a study of food additive purchasing behaviour. Furthermore, perception does not exist without the ability to perform primary information processing (Antonides & Van Raaij, 1998:110). The three stages of the perceptual process are discussed firstly, followed by selective perception whereafter the discussion focuses on information processing and information sources available to food additive label reading consumers. Lastly, the consumer decision-making process and how it influences purchasing behaviour about products containing food additives is discussed.

3.2 THE PERCEPTUAL PROCESS

Perception is defined as the process by which an individual consumer observes (Rousseau & Spoelstra, 2003:218), selects, organises, interprets (Assael, 1995:185; Sheth *et al.,* 1999:298; Hanna & Wozniak, 2001:102; Sheth & Mittal, 2004:129; Schiffman & Kanuk, 2004:158) and reacts (Rousseau & Spoelstra, 2003:218) to stimuli (such as food additive information) in a meaningful way in order to form a coherent picture of the world. Thus, perception involves both information from our senses and the interpretation of that sensory information in the brain (Matlin, 1983:6). A study of perception is the study of the way individual consumers gather and interpret information (Cant *et al.*, 2006:115) such as food additive information in the context of the present study. In fact, everything individual consumers know about the world is based upon perceptual information (Matlin, 1983:2; Cant *et al.,* 2006:115). Two individuals may be subjected to the same stimuli under the same apparent conditions, but how each person recognizes, selects, organises and interprets these stimuli is a highly individual process based on each consumer's own needs, values and expectations (Schiffman & Kanuk, 2004:158). According to Hanna and Wozniak (2001:103) and Solomon (2004:49), the perceptual process consists of three stages (§ 1.2) (Figure 3.1).

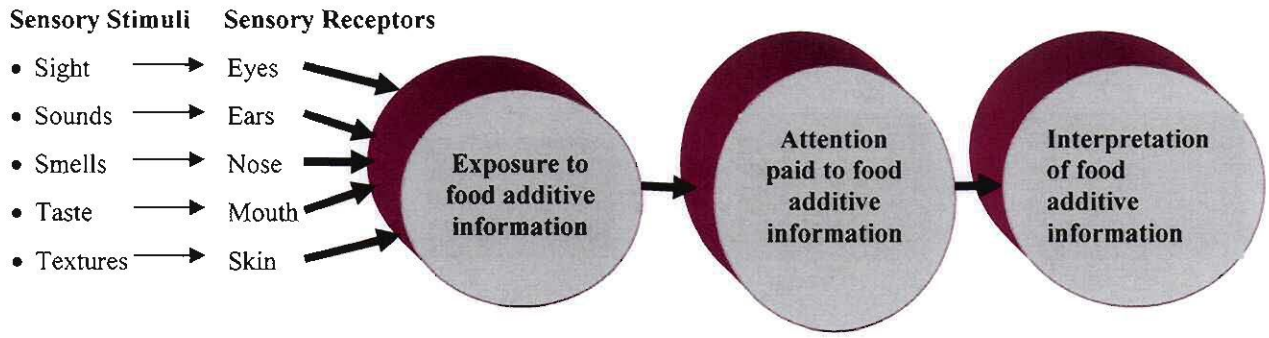


Figure 3.1 An overview of the perceptual process (Adapted and applied from Solomon, (2004:49))

Hawkins *et al.* (2004:278) and Cant *et al.* (2006:116) add a fourth stage, namely memory. These authors argue that stimuli represent information the consumers perceive and thus described their models as information processing models which includes memory. Because the fourth stage was seen as part of information processing and not as the perceptual process *per se*, the author of the present study doubts its significance in the discussion of the perceptual process. It was discussed under information processing (3.3.2). Nevertheless, before any type of marketing stimulus or message can affect consumers, they must be exposed to it (Hawkins *et al.*, 2004:278; Cant *et al.*, 2006:116).

3.2.1 Exposure to stimuli

Exposure (Figure 3.1) to stimuli is the first step in the process of perception (Hawkins *et al.*, 2004:278; Cant *et al.*, 2006:116), for example, these stimuli could be information about MSG. It occurs when a stimulus comes within the range of our sensory receptor nerves (Hanna & Wozniak, 2001:103; Cant *et al.*, 2003:115; Solomon, 2004:49; Hawkins *et al.*, 2004:285). Hanna and Wozniak (2001:103) define exposure as the act of deliberately or accidentally coming into contact with environmental stimuli. Rousseau and Spoelstra (2003:219) named this first step observation and Peter and Olson (2008:200) named this phenomenon information contact. Nevertheless, a stimulus is any unit of input to any of the human senses (sensory receptors) as illustrated in Figure 3.1.

For example, it can be to see a "MSG free" claim on a food product label in the store, to hear from a friend to avoid products containing tartrazine, to smell the yeast in bread, to taste ethyl phenylacetate (honey flavourant) in an artificial flavoured muffin or to feel the texture of carrageenan (thickener) in a commercially prepared sauce. Other examples of stimuli or sensory inputs can include products, packages, advertisements, words, pictures, symbols and commercials (Assael, 1995:186; Schiffman & Kanuk, 2004:159) and are called marketing stimuli (Hoyer & MacInnis, 2001:81). Moreover, exposure is critical to consumers' subsequent processing of any stimulus (Hoyer & MacInnis, 2001:81). Thus consumers must be exposed to food additives through a single or variety of information sources before they can form perceptions about them. Furthermore, exposure to a message means only that it has been seen or heard. There is no guarantee that the consumer will pay attention to it (Cant *et al.*, 2006:117) which is the second step in the perceptual process.

3.2.2 Attention paid to stimuli

Attention is the key that unlocks the door to perception (Coon, 2006:203). Attention (§ 3.3.2.2) occurs when the stimulus activates one or more sensory receptor nerves and passes the resulting sensations on to the brain for processing (Figure 3.1). It is also called information processing (Hawkins *et al.*, 2004:287). In other words attention refers to the extent to which the processing activity is devoted to a particular stimulus (Hoyer & MacInnis, 2001:84; Solomon, 2004:64; Cant *et al.*, 2006:117). Hanna and Wozniak (2001:103) define attention as the allocation of an individual's mental capacity or cognitive ability to a stimulus or task.

Attention always occurs in the context of a situation and is influenced by the stimulus selection factors (Solomon, 2004:66) that shape perception (Assael, 1995:300). Therefore, attention is determined by three factors, the stimulus, the individual and the situation (Cant *et al.*, 2006:117). The stimulus factor has the following characteristics: size and intensity, colour and movement, position, isolation, format, contrast or expectations, quality (Hanna & Wozniak, 2001:112; Hawkins *et al.*, 2004:284-287; Cant *et al.*, 2006:117), novelty (Solomon, 2004:68), repetition, familiarity (Rousseau & Spoelstra, 2003:225), interestingness, information quantity (Hawkins *et al.*, 2004:288), as well as sound, taste and smell (Assael,

1995:199; Sheth & Mittal, 2004:131). The individual factors are characteristics of the individual and include interest, need and ability or attention span (Hawkins *et al.*, 2004:288; Cant *et al.*, 2006:118), motivation (Rousseau & Spoelstra, 2003:227) as well as personal knowledge, expertise on the relevant topic and prior experiences with similar stimuli (Assael, 1995:300; Sheth & Mittal, 2004:130), beliefs, feelings, personalities, self-perception, lifestyles, risk tolerances and mental sets (Hanna & Wozniak, 2001:112). Situational factors include stimuli in the environment such as time pressure (Hawkins *et al.*, 2004:289; Cant *et al.*, 2006:117-118) and programme involvement (Hawkins *et al.*, 2004:289). Once a consumer has been exposed to a stimulus or marketing message, and has attended to it, the consumer still needs to interpret the stimulus or message (Hanna & Wozniak, 2001:111; Cant *et al.*, 2006:118).

The attention consumers pay to food additive information is of importance to this study. The empirical study was used to determine the various stimulus selection factors regarding food additives that shape the perceptions of consumers in order to develop the model of consumers' perceptions about food additives.

3.2.3 Interpretation of stimuli

Interpretation (Figure 3.1) is the assignment of meaning to sensations or sensory stimuli (Sheth & Mittal, 2004:130; Solomon, 2004:69; Cant *et al.*, 2006:118) and refers to how consumers create personal knowledge and beliefs (Peter & Olson, 2008:51). Just as consumers differ in terms of the stimuli that they perceive, the eventual assignment of meaning to these stimuli varies as well (Solomon, 2004:69; Schiffman & Kanuk, 2004:176; Cant *et al.*, 2006:118).

Part of interpretation of a stimuli is the ability (§ 4.4.7.2) a consumer has to perform primary information processing such as categorisation (Antonides & Van Raaij, 1998:110). The stimuli consumers perceive are often highly ambiguous (Solomon, 2004:71; Schiffman & Kanuk, 2004:176; Cant *et al.*, 2006:118). For example, consumers do not understand the meaning of the E-numbers on product labels (Wandel, 1997:213). It is, therefore, up to the consumer to determine the meaning based on the consumers' prior experiences, expectations

and needs (Antonides & Van Raaij, 1998:111; Solomon, 2004:71), wishes and interests (Schiffman & Kanuk, 2004:176).

Furthermore, the interpretation stage of perception is also based on elaborative activities (Hawkins *et al.*, 2004:341). Elaboration (§ 3.3.2.3, 4.4.6 & 4.4.7) refers to the amount of integration between the new information and existing knowledge stored in the memory or the number of personal connections made between the stimulus and consumer's life experiences and goals (Peter & Olson, 2008:121). Elaboration falls along a continuum ranging from low to high integration of newly acquired information (Engel *et al.*, 1993:405). Elaborative activities serve to redefine or add new elements to memory (Hawkins *et al.*, 2004:341). Memory will be discussed further in section 3.3.2.4.

The importance of interpretation of stimuli for marketers, consumer scientists and consumer educators lies in that fact that perception is based on a consumer's own interpretation of a stimuli and not on the objective reality (Van Heerden, 2002:16) that ultimately influences behaviour (Hawkins *et al.*, 2004:291). For instance consumers might interpret the fact that MSG might cause a reaction to some sensitive consumers as "MSG is bad for health". How close a consumer's interpretation is to reality depends on the clarity of the stimulus, the prior experience of the consumer and his or her motives (§ 4.4.7.1) and interest at the time that the perception is formed (Schiffman & Kanuk, 2004:176). Four types of objective reality may be distinguished:

- the objective reality of people and products;
- the reality as constructed and represented in advertisements, usage instructions, information provided by consumer organisations and information from other sources such as food labels;
- the reality from other consumers, their experiences and judgments; and
- the subjective reality (perception) of consumers (Antonides & Van Raaij, 1998:109).

Therefore, a consumer's own observation of the objective reality of other consumers' behaviour, products, ingredients and advertisements influences a consumers' perception or subjective reality.

The two basic principles of perceptual categorisation and perceptual interference help consumers to interpret information (Assael, 1995:208) such as food additive information or stimuli.

3.2.3.1 Perceptual categorisation

Hanna and Wozniak (2001:118) described perceptual categorisation (§ 3.3.2.2) as the tendency of consumers to group somewhat similar objects together. According to Antonides and Van Raaij (1998:110), categorisation is the result of perception and simultaneously supports the structure perception. To categorise objects, products or ingredients, consumers weigh cues from the stimulus item to possible matches in their long-term memory. When consumers first learn about a product, they classify it at the most basic level (Hanna & Wozniak, 2001:118).

Cognitive interpretation is a process whereby stimuli are placed into existing categories of meaning (Hawkins *et al.*, 2004:291). For example, a "no MSG" claim on soup powder might be interpreted by consumers as MSG free food and, therefore, it must be good. Thus, the information is categorised in the memory (Hanna & Wozniak, 2001:120). This is an interactive process. The addition of new information to existing categories also alters those categories (search for "no MSG" claims on more products) and their relationship with other categories (MSG is bad for health). Apart from cognitive interpretation, a stimulus can lead to affective interpretation. Affective interpretation is the emotional or feeling response triggered by a stimulus such as an advertisement (Hawkins *et al.*, 2004:292) (such as "I hate MSG containing products").

The more involved a consumer becomes with the product, the greater the likelihood that they classify stimuli at more refined levels or sub-categories (Hanna & Wozniak, 2001:119). Information about a new product is then stored in the memory. As consumers gain more information about the product, the information is recalled in clusters of thoughts, ideas and symbols known as schema (Assael, 1995:210; Antonides & Van Raaij, 1998:120-125). Furthermore, consumers may use surrogate indicators to categorise products (Hanna & Wozniak, 2001:119). Surrogate indicators are the cues that consumers rely on to place

products into categories. Price is sometimes used as a surrogate indicator for product quality (Hanna & Wozniak, 2001:119). In other words the higher the product price, the better the consumer thinks the quality is. It follows that in new situations consumers perceive objects such as food additives in the present study, and try to classify these objects into meaningful categories (Antonides & Van Raaij, 1998:110) based on their existing knowledge of food and nutrition.

3.2.3.2 Perceptual inferences

As mentioned before consumers form associations between stimuli. They develop beliefs about products, based on previously acquired information and their own experiences with the stimuli (Assael, 1995:211). Perceptual inferences are beliefs based on these forms of prior-knowledge and experiences that a consumer unconsciously or consciously comes to assign to products or ingredients (Assael 1995:212; Hanna & Wozniak, 2001:120). Consumer inference is the process through which consumers assign a value to an attribute or item not contained in a message on the basis of other data in that message. When data about an attribute are missing, consumers may assign a value to the attribute based on a presumed relationship between that attribute and the one attribute for which data are available (Hawkins *et al.*, 2004:298). For example, a food label that indicates "no added MSG" may induce consumers to infer that the product contains no MSG though it might contain natural occurring MSG (FSANZ, 2002; Herbst, 2002:1). Consumers may assign it the average of their assessments of the available attributes. In addition, they may assume it to be weaker than the attributes for which the data are supplied, or any of a larger number of other strategies may be used (Hawkins *et al.*, 2004:298). Evaluation-based inferences are judgments leading to a consistently positive or negative evaluation. If the consumer has a positive experience with a product, consumers tend to think that all products are good. This is called the halo effect (Hanna & Wozniak, 2001:120; Schiffman & Kanuk, 2004:178). Furthermore, many consumers tend to jump to conclusions before examining all the relevant evidence (Schiffman & Kanuk, 2004:177) such as additives are chemicals and chemicals cause cancer (Sloan *et al.*, 1986:523; Bruhn, 2002:102).

Perceptual inferences are of significance to this study because inferences are beliefs that consumers form (Assael, 1995:212) about food additives based on their past association with additives. The formation and change of beliefs are of importance in both the central (§ 4.4.5.1) and peripheral routes (§ 4.4.5.2) to persuasion in the ELM (§ Figure 4.1).

3.2.4 Selective perception

Selectivity means that consumers must decide which of the possibly hundreds of stimuli they want to focus on at any one time (Hoyer & MacInnis, 2001:84; Solomon, 2004:65; Cant *et al.*, 2006;115). The number of stimuli to which consumers are exposed to is potentially overwhelming (Hoyer & MacInnis, 2001:84). Therefore, consumers perceive stimuli selectively because each individual is unique in the combination of his or her needs, experiences and personal characteristics. The process of selective perception means that consumers attend to only a small portion of the stimuli to which they are exposed. Consumers are more likely to be aware of stimuli that relate to their current needs (for example, some consumers are more aware of the colourant tartrazine (Williams *et al.*, 2004:35) because they want to avoid it rather than the colourant carotene due to having a hyperactive child). Consumers can also see what they want to see and do not see what they do not want to see (Assael, 1995:196; Schiffman & Kanuk, 2004:168; Sheth & Mittal, 2004:132; Solomon, 2004:59). Furthermore, selective perception occurs at the exposure, attention and interpretation stages of the perceptual processes (Figure 3.1) as discussed in the next section. Stimuli that are seen and felt and the meaning that consumers assign to these stimuli are filtered through their perception, which explains why different consumers may describe seemingly the same objects or occurrences uniquely. Selective perception is the term given to this dynamic. Consumers may screen out or modify information presented if it is in conflict with their previously learned beliefs (McNeill & Crotts, 2006:58).

Rousseau and Spoelstra (2003:222) argue that selective perception is the second step in the process of perception, whilst other authors see selective perception as part of exposure (Solomon, 2004:59), as a topic on its own (Assael, 1995:196; Schiffman & Kanuk, 2004:168) or as biases in the perceptual process (Sheth *et al.*, 1999:303, Sheth & Mittal, 2004:132). Nevertheless, selective perception including selective exposure, selective attention and

selective interpretation are of significance to this study. The reasons for its importance are mainly because it forms the heart of the model of consumers' perceptions about food additives and consequent purchasing behaviour (§ 7.2.9) which is the primary objective (§ 1.3) and the empirical part (§ Chapter 6) of the present study.

3.2.4.1 Selective exposure

Most of the stimuli to which a consumer are exposed are self-selected (Hawkins *et al.*, 2004:279; Cant *et al.*, 2006:116). Consumers must cope with the barrage of stimuli they are exposed to every day. In order to cope, consumers ignore some stimuli and some possible interpretations of stimuli, thus biasing their perceptions of incoming information (Sheth & Mittal, 2004:132). This process is called selective exposure (Schiffman & Kanuk, 2004:172) or gatekeeping (Sheth & Mittal, 2004:132) and is influenced by consumers' beliefs (Assael, 1995:199). Selective exposure is defined as a tendency of consumers to ignore media and advertisements that address topics that are unimportant to consumers (Hanna & Wozniak, 2001:110). Selective exposure of the participants in this study will be discussed in section 7.2.1.

3.2.4.2 Selective attention

The key characteristics of attention are that it is selective, it is capable of being divided and it is limited (Hoyer & MacInnis, 2001:84). The fact that attention is selective means that consumers can control what they are focusing on (Hoyer & MacInnis, 2001:84; Schiffman & Kanuk 2004:172). Consumers might have a heightened awareness of stimuli that meet their needs, beliefs (Hanna & Wozniak, 2001:110; Schiffman & Kanuk, 2004:172) or interests and a minimal awareness of stimuli irrelevant, threatening or contrary to their beliefs (Hanna & Wozniak, 2001:110) and needs. Thus consumers are likely to note stimuli or messages for products that would satisfy their needs and disregard those in which they have no interest (Sheth & Mittal, 2004:133; Schiffman & Kanuk, 2004:172). Furthermore, the tendency of consumers to block threatening or contradictory stimuli (thus consumers developed blocking

mechanisms) (§ 7.2.2) from their conscious processing is known as perceptual defense (Hanna & Wozniak, 2001:111; Rousseau & Spoelstra, 2003:223).

A second aspect of attention is that it is capable of being divided (Hoyer & MacInnis, 2001:84). Thus consumers can parcel their mental resources into units and allocate some to one task and some to another. This can lead to distraction during which one stimulus can pull away attention to another stimulus. The third and critical aspect of attention is that it is limited. Although consumers may be able to divide their attention, they can attend to multiple things only if processing them is relatively automatic, well practiced and effortless. Because the brain's capacity to process information is limited, consumers are very selective about what they pay attention to (Solomon, 2004:65). This might implicate that when consumers are exposed to too much information about food additives they would not be able to attend to information of importance to them.

3.2.4.3 Selective interpretation

Once an external stimulus attracts a consumer's attention, their perceptual system begins to consciously process it by means of selective interpretation. Selective interpretation can be defined as the act of combining relevant knowledge structures with expectations and intentions to derive meaning from a stimulus (Hanna & Wozniak, 2001:11). Consumers also interpret the content and message of stimuli selectively. Selective interpretation acts as a screen or filter through which information must flow. This filter enables the consumer to ignore some bits of information included in a marketing message and to change the meaning of other bits of information (Cant *et al.*, 2006:118). After an important purchase, consumers seek information that will reassure them about the wisdom of their selection. Consumers also distort negative information that might threaten their ego (Sheth & Mittal, 2004:133). Furthermore, selective interpretation occurs in order for perceptions to conform to prior beliefs (Assael, 1995:199) and experiences (Cant *et al.*, 2006:118) the consumers have.

3.2.4.4 Functions of selective perception

In addition to the nature of the stimuli itself, the stimuli which is selected depends on two major factors, namely consumers' previous experience (as it affects their expectations) and motives at the time of exposure to the stimuli (Schiffman & Kanuk, 2004:168). The nature of the stimuli includes aspects such as its physical attributes, copy claims and the font size on the label (Schiffman & Kanuk, 2004:169). Physical attributes (such as food additive ingredients), claims (such as "no preservatives"), the font size of the ingredient list and additive labels might play a role in distracting the consumer. The factor of expectation can be described as the fact that consumers normally see what they expect to see and is based on familiarity, previous experience and/or preconditioned set (Rousseau, & Spoelstra, 2003:230; Schiffman & Kanuk, 2004:196; Solomon, 2004:65) of values and beliefs (Coon, 2006:200). If the stimuli do not conform to the consumer's beliefs, consumers will try to avoid the stimuli that cause fears and anxieties. This is called perceptual defense (Assael, 1995:200; Solomon, 2004:65; Rousseau & Spoelstra, 2003:223). For example, consumers appear to believe that artificial ingredients are chemicals and, therefore, artificial ingredients cause cancer and should be avoided (Sloan *et al.*, 1986:523; Bruhn, 2002:102). Perceptual defense differs from perceptual inferences in the sense that in the latter case consumers provides a more elaborate explanation for their actions.

The second factor of motives pertain to consumers' needs (Assael, 1995:200; Rousseau, & Spoelstra, 2003:227; Schiffman & Kanuk, 2004:171; Solomon, 2004:65; Cant *et al.*, 2006:116), or wants (Rousseau, & Spoelstra, 2003:227; Schiffman & Kanuk, 2004:171), interests (Cant *et al.*, 2006:116) and goals (Hawkins *et al.*, 2004:279). Assael (1995:200), Rousseau and Spoelstra (2003:223) and Solomon (2004:65) called the second factor perceptual vigilance. The stronger the need for product specific stimuli the greater the tendency to ignore unrelated stimuli from the environment (Schiffman & Kanuk, 2004:171). The question can, therefore, be asked whether perceptual vigilance is a relevant factor in consumers' perceptions about food additives (§ 6.3.3.2.1).

3.2.5 Perceptual organisation

One factor that determines how a stimulus will be interpreted is its assumed relationship with other events, sensations or images (Solomon, 2004:69). Assael (1995:204) describes perceptual organisation as the action where consumers group information from various sources into a meaningful whole (Hoyer & MacInnis, 2001:99) to comprehend it better and to act on it. The basic principle of organisation is integration. The consumer's brain tends to relate incoming sensations to others already in the memory, based on fundamental organisational principles (Solomon, 2004:70). Such an organisation simplifies information processing and provides an integrated meaning for the stimuli (Assael, 1995:204). These principles are a function of the gestalt or pattern formed by the characteristics of the stimuli, the individual and the situation (Assael, 1995:204; Hanna & Wozniak, 2001:116; Hawkins *et al.*, 2004:296; Schiffman & Kanuk, 2004:173). Consumers have strong tendencies to organise their perceptions into "simple" patterns. Thus consumers will opt for simple perceptions even when more complex perceptions can be derived from the stimulus (Engel *et al.*, 1993:406; Schiffman & Kanuk, 2004:173).

Perceptual organisation is of significance to this study. Consumers perceive food additives and their terminology as difficult and confusing to understand (Prättälä *et al.*, 1985:243; Crawford & Baghurst, 1990:231; Crowe *et al.*, 1992:20; Worsley, 1994:223; Abbott, 1997:47; Wandel, 1997:213; Kidd, 2000:55), thus it was important to determine how food additive label reading consumers organise their perceptions in order to develop better marketing and consumer education communications.

3.2.5.1 Closure principle

Closure from the Gestalt theory refers to consumer's tendency to develop a complete picture or perception even when elements in the perceptual field are missing. In other words a consumer has a need to organise perceptions so that they form a meaningful whole (Hoyer & MacInnis, 2001:99). Because of this drive to "fill in" the missing parts, the presentation of an incomplete stimulus provides marketers, consumer scientists and consumer educators with a

mechanism of increasing the effort and involvement that occur during information processing (Engel *et al.*, 1993:405; Assael, 1995:205; Antonides & Van Raaij, 1998:114; Hanna & Wozniak, 2001:116; Solomon, 2004:70; Schiffman & Kanuk, 2004:175). For example, if a product is good with regard to three product attributes (such as brand name, taste and price) consumers tend to assume that the product will be good with regard to a fourth attribute (flavourant) as well (Antonides & Van Raaij, 1998:118). The question that can thus be asked is how consumers complete their perception about food additives if some information is missing. This could be of significance in the interpretation of the results (§ Chapter 6) and the application of the ELM (§ 3.2.3) in the present study.

3.2.5.2 Similarity principle

The principle of similarity tells one that consumers tend to group objects together that share similar physical characteristics (Assael, 1995:204; Hoyer & MacInnis, 2001:100; Solomon, 2004:71). Consumers have the tendency to group products together because of similarity in name, design and colour (Assael, 1995:206). Consumer may, for example, have the perception that all yellow coloured soft drinks contain food additives that pose a health risk, thereby rejecting products that contain them (Sloan *et al.*, 1986:525). The similarity principle is of significance in the interpretation of consumers perceptions about food additives as indicated by the results of the present study.

3.2.5.3 Figure-ground principle

The figure-ground principle states that one part of a stimulus will dominate (the figure), while the other part recedes into the background (the ground) (Assael, 1995:207; Solomon, 2004:71). The stimulus can be made a focal point of the marketing message with the context that surrounds the focus (Assael, 1995:207; Hanna & Wozniak, 2001:118; Schiffman & Kanuk, 2004:173; Solomon, 2004:71). In other words, the figure is well defined in the forefront and the ground is indefinite, hazy and in the background (Hoyer & MacInnis, 2001:99). For example, a claim displayed in contrasting colour and large font on the front of a

food label. The question can be asked whether the figure-ground principle is of importance to consumers who are reading food additive labels.

It follows from this section that stimuli represent information that consumers perceive. Information processing occurs when consumers evaluate information from advertising, food labels, friends or own experiences by organising and interpreting it (Assael, 1995:21). The next section focuses on how consumers process the information they perceive.

3.3 CONSUMER INFORMATION ACQUISITION AND PROCESSING

In this section the researcher extends the discussion of perception by focusing on how consumers process information. It is firstly discussed how information is acquired from various information sources. Then information processing is discussed with particular emphasis on the role of the memory. In order to make purchasing decisions, consumers acquire and process information from advertisements, experience with products, friends, neighbours, food labels and other sources (Abbott, 1997:46). The processing of information requires that consumers perceive and remember information. Perception is, therefore, a key component in information processing (Assael, 1995:225). However, information processing also requires that consumers go beyond the selection, organisation and interpretation of information as described in section 3.2. Consumers must also retain the information in their memory and retrieve it (Assael, 1995:225) when for instance evaluating food products containing food additives. Consumers' information processing can result in purchasing behaviour, whether it is positive or negative. In other words, it is the action to buy or not to buy (Assael, 1995:94-95; Rousseau & Spoelstra, 2003:120).

Today's consumer has access to a significant amount of information, while an excessive amount of advertisements capture most of the attention and criticism (Hollingsworth, 2000:55). A by-product of the media age is that useful information has an easier time of finding its way to consumers, in such ways that it obscures the food labels as the source of nutritional and other information (Hollingsworth, 2000:54). Fortunately, consumers are better equipped to gain knowledge about diet, health and nutrition and health and nutrition organisations are better able to release information into the marketplace. Consumers' appetite

for food news seems nearly insatiable. At the same time, consumer confusion is provoked in today's fast paced, multi-media environment (Reinhardt, 2004:128).

Since perception is a key component in information acquisition and processing (Assael, 1995:225) about food additives, it can affect consumers' purchasing behaviour (Assael, 1995:225). The review of the relevant literature is of significance in the present study in order to interpret the results (§ Chapter 6) and to adapt the ELM (Figures 4.1 & 7.1) according to consumers' perceptions.

3.3.1 Information acquisition

An information acquisition situation may contain social factors such as word-of-mouth communication from friends and physical stimuli such as labels on a product package that can influence consumers' cognitions and behaviours (Peter & Olson, 2008:272). In addition, Figure 3.2 shows the three different processes leading to information acquisition. The food additive information search was applied to the model of Assael (1995:227) (Figure 3.2).

An ongoing search for food additive information such as tartrazine might characterise the consumer with enduring involvement in food products. The purchase-specific search is characteristic of the consumer with situational involvement who collects information when making a purchasing decision, for example, to ask a friend about the food additive tartrazine. The third process does not require an active search for information, instead it involves the passive acquisition of information. For example, the consumer reads a magazine and sees an article about tartrazine. Such a passive involvement is more typical of uninvolved consumers.

For the three processes of information acquisition the consumer utilises **external** information sources (Assael, 1995:226-227; Antonides & Van Raaij, 1998:251), such as food labels and food additive brochures. In addition, consumers sometimes believe more information is necessary in order to reduce the risk of making a poor choice. More information can also be retrieved from the **internal** source of memory (Assael, 1995:226-227; Antonides & Van

Raaij, 1998:251) such as past experience with some food additives and past searches about additives as seen in Figure 3.2.

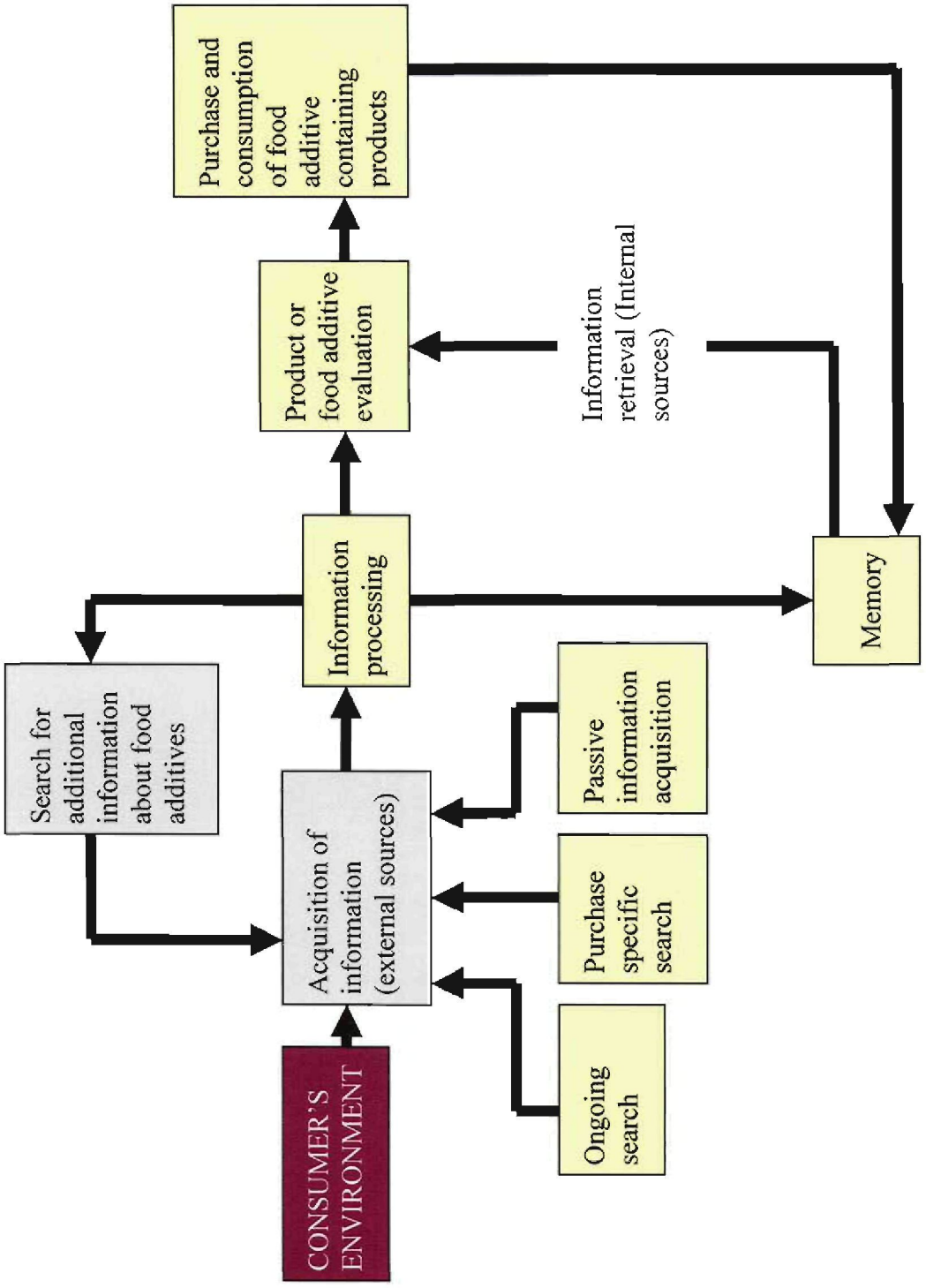


Figure 3.2 **Role of information acquisition in consumer decision-making (Adapted from Assael, (1995:227))**

A key component of information acquisition in Figure 3.2 is the search for additional sources of external information such as food additive information from friends, family and dietitians (Assael, 1995:226). The choice of information sources will be discussed in the following section.

3.3.1.1 Search strategies

The choice of information sources depends partly on a consumer's search strategy. A search strategy is the pattern of information acquisition that consumers' utlise to solve their decision problems (Sheth & Mittal, 2004:285). Problem–solving efforts vary from virtually none to very extensive. From a public policy point of view, information search is encouraged to develop more knowledgeable consumers (Peter & Olson, 2008:201). Many problems are resolved by the consumer using only previously stored information (Hawkins *et al.*, 2004:529). For example, consumers remember to avoid yellow-coloured soft drinks because their children become hyperactive when drinking such products. The consumer uses the recalled product information from the memory, thus nominal decision-making has occurred (Hawkins *et al.*, 2004:537). Hawkins *et al.* (2004:537) argue that most purchases are the result of nominal decision-making and, therefore, limited external search immediately prior to purchase takes place. This is particularly true for relatively low-priced convenience goods such as soft dinks and canned foods. This process is also called routinised response behaviour (Schiffman & Kanuk, 2004:549), habitual decision-making (Rousseau & Spoelstra, 2003:124; Solomon, 2004:295), impulse purchases (Hanna & Wozniak, 2001: 291) or routine problem-solving (Sheth & Mittal, 2004:285).

Likewise, a consumer may notice a product in-store because of the attention-attracting power of a point-of-purchase display (Hanna & Wozniak, 2001:291), such as a "no MSG" claim clearly (with large font size and in a brightly coloured "callout") displayed on the front of the label. The purchase is made without seeking additional information and the consumer has low motivation to search for information (Solomon, 2004:295). This is limited decision-making and mainly involves a search of internal information. It is also called limited problem-solving

(Schiffman & Kanuk, 2004:549, Sheth & Mittal, 2004:286; Solomon, 2004:295; Peter & Olson, 2008:176).

An external information search tends to increase as extended decision-making takes place (Hawkins *et al.,* 2004:529). Simultaneously an internal information search also takes place (Hanna & Wozniak, 2001:291; Solomon, 2004:297). Furthermore, the higher the risk consumers perceive about the product the more extensive the information search that will take place (Hanna & Wozniak, 2001:292). If this is true, then consumers who are concerned about cancer-causing food additives will search for more information about that particular food additive. Various authors argue that the more complex the attributes of a product or ingredient are, the more information will be searched for (Hanna & Wozniak, 2001:291; Hawkins *et al.*, 2004:529; Schiffman & Kanuk, 2004:549; Sheth & Mittal, 2004:286; Solomon, 2004:295; Peter & Olson, 2008:179). In other words, if consumers perceive additives as difficult or complex to understand, the more information they will need to make a purchasing decision. The question can thus be asked: to what extent does a consumer search for more information?

3.3.1.2 Determinants of the extent of the information search

There are several factors that encourage consumers to acquire more information about a product they consider purchasing, namely:

- high consumer involvement;
- high perceived risk;
- little product knowledge and expertise;
- less time pressure;
- high product price;
- familiarity and expertise;
- more product differences; and
- low monetary costs to obtain information (Assael, 1995:228; Sheth & Mittal, 2004:287-292).

In general, the less time there is available the shorter the information search, the less available information will be used, and the more suboptimal purchase will be made (Hawkins *et al.*, 2004:483). Furthermore, time pressures have increased the demand for high-quality, easy-to-prepare products (Hawkins *et al.*, 2004:483). In other words consumers operate by weighing the costs of the information search against the benefits of acquiring additional information (Assael, 1995:229). In addition several other factors can be listed that affect information search, such as: price, and mental energy (Hawkins *et al.*, 2004:539; Peter & Olson, 2008:202), but this falls beyond the scope of this study.

As mentioned before, perceived risk is another component or function of information processing (Assael, 1995:251, Antonides & Van Raaij 1998:256; Hawkins *et al.*, 2004:542). It deserves more attention as it is of particular importance in food additive information search in this study. Schiffman and Kanuk (2004:179) define perceived risks as the uncertainty that consumers face when they cannot foresee the consequences of their purchasing decisions. In other words, perceived risks concern the undesirable consequences that consumer want to avoid when they buy and use products (Assael, 1995:251; Cant *et al.*, 2006:199). Table 3.1 indicates how the different risk components have implications for consumers searching for food additive information.

Furthermore, the degree of risk perceived depends on the specific individual consumer. Some consumers tend to perceive high degrees of risk in various consumption situations whilst other consumers tend to perceive little risk in the same situation. High risk perceivers are often described as narrow categorisers because they limit their choice to a few safe alternatives. For example, consumers who avoid all types of additives in beverages due to the perceived health risk, turn to only fresh, 100% pure fruit juice, thereby limiting their product choice. On the other hand, low risk perceivers have been described as broad categorisers, because they tend to make their choices from a much wider range of alternatives. In cases where consumers are not concerned about food additives, they can select beverages from a wider range, including all kinds of soft drinks and all kinds of fruit juices. An individual consumer's perception of risk also varies with product categories (Schiffman & Kanuk, 2004:197), such as consumers who avoid all types of soft drinks due to the additive content. In addition to product-category perceived risk, researchers identified product specific

perceived risks (Dowling & Staelin, 1994:134), for example, consumers who avoid only yellow coloured soft drinks that specifically contain tartrazine.

Table 3.1 Components of perceived risk associated with food additive safety (Adapted from Assael (1995:252), Antonides and Van Raaij (1998:256), Rousseau and Spoelstra (2003:224), Hawkins *et al.* (2004:542), Sheth and Mittal (2004:287), Schiffman and Kanuk (2004:197), and Peter and Olson, (2008:77))

Perceived risk component	Implication
Physical loss	Negative health impacts on consumers, for example, to cause cancer or hyperactivity, in other words **health risks.**
Performance/Functional loss	Taste and/or nutritional value of food product reduced due to the use of artificial additives, artificial after taste of some sweeteners.
Financial loss	Paying for medical treatment or loss of income due to illness caused by a specific food additive.
Time loss	Effort in selecting the product and time loss due to illness.
Social loss	Poor food choice leading to social embarrassment, for example, if a child is hyperactive due to additives consumed.
Psychological loss	Concerns experienced by consumers that they might be exposed to additive safety risks.

Consumers characteristically develop their own strategies for reducing perceived risks. These risk reduction strategies enable them to act with increased confidence when making purchasing decisions, even though the consequences of such decisions remain somewhat uncertain. Schiffman and Kanuk (2004:198) propose some of the more general risk reduction strategies which can be applied to the present study as increased information search (such as consumers reading all information they can find from a variety of sources about tartrazine), consumers may equate price with quality (consumers that think that more expensive fruit juices contains no additives) and consumers seek reassurance (for example consumers who seek the Attention Deficit Hyperactivity Association of South Africa (ADHASA) logo

claiming that beverages are tartrazine free). Reassurance can be in the form of government and private laboratory test results, warranties and pre-purchase trials (Schiffman & Kanuk, 2004:198).

Finally, in a purchasing decision consumers consider the benefits and risks of each choice alternative by integrating the information about positive and negative consequences (Peter & Olson, 2008:78). The balance between the benefits and risks of food additives was discussed in Chapter 2 (§ 2.9).

3.3.1.3 Sources of food additive information

The various communication media play a major role in information dissemination in modern consumer societies. They are part of informal education and both reflect and influence consumer behaviour. The television, in particular, plays a major role in information and influencing children today. Newspapers and television companies report on food additives, diet and its health consequences as well as the variety of enjoyable foods and beverages. Their coverage appears to have a profound effect on food purchaser's opinions and choices (Tansey & Worsley, 1995:182). In contrast, Abbott (1997:47) argues that the media is potentially a valuable educative resource, although its impact is notoriously difficult to evaluate because of the problem of separating their influences from other factors.

The media are just one source of information and consumers can be overwhelmed by the opinions of their families, friends and colleagues (Tansey & Worsley, 1995:184). Unfortunately the media thrive on controversy and bad news. Like retailers, the media sell what their readers and viewers want (Klapthor, 2004b:58). The different types of information sources that can provide food additive information are presented in descending order of importance, with TV (43.5%) followed newspapers (21.5%), magazines (12.5%) and fourthly the radio (8.3%) (Abbott, 1997:46). On the other hand, Shine *et al.* (1997a:284) identified the communication sources which consumers acquired nutritional information from in descending order as the "popular media", family and friends and the doctor or dietitian. Marks (1993:8) observes that consumer's preoccupation with food nutrition emanates from intense

commercial pressure to buy healthy food (through promotional campaigns) and because the expectations of health are much higher. However, misinformation is a prevailing problem with such media attention.

As mentioned before (§ 3.3) consumers can utilise several sources of information when making a purchasing decision ranging from internal sources to external sources (§ 3.5) as shown in Figure. 3.3.

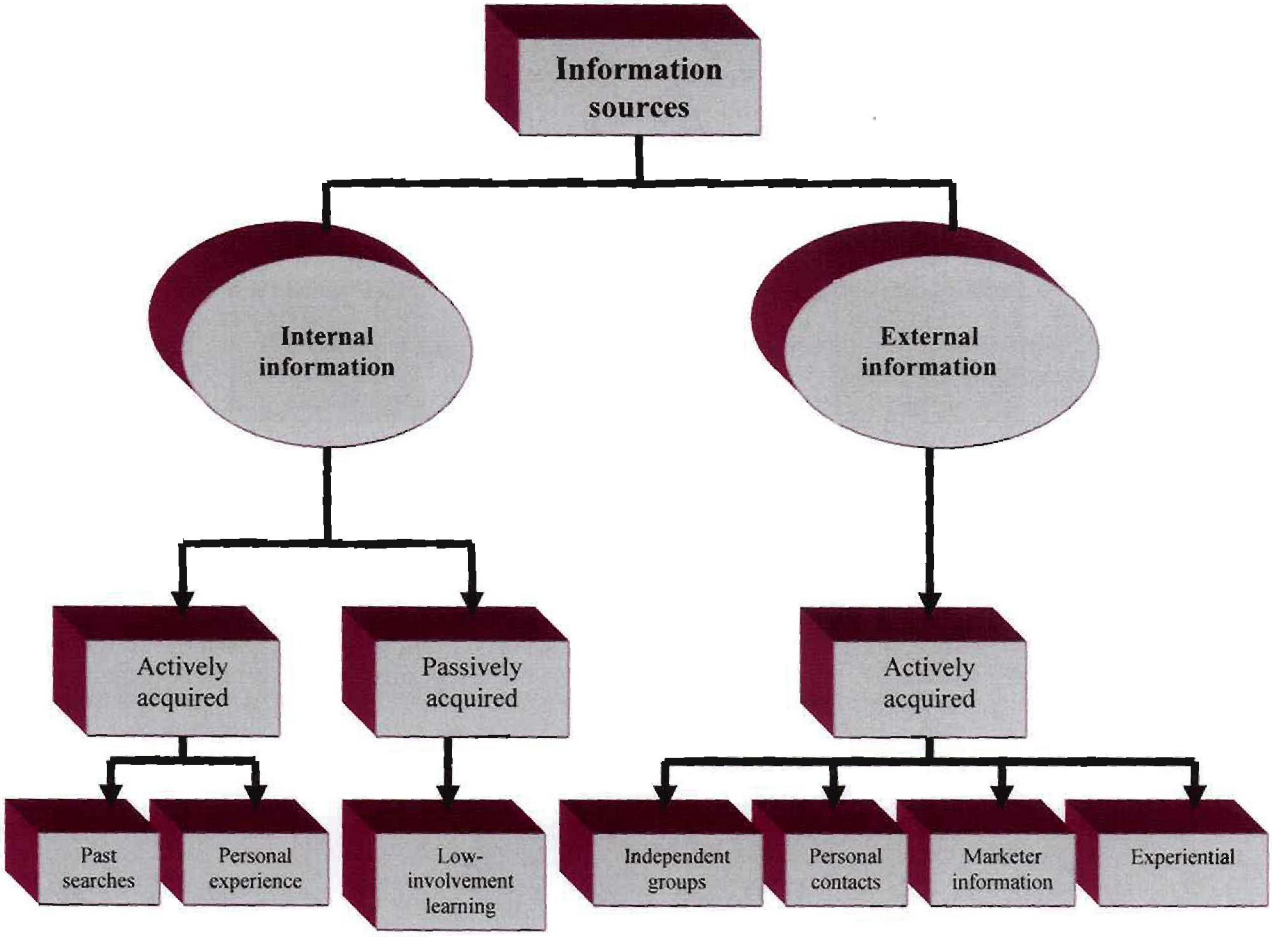


Figure 3.3 Information sources for a purchasing decision (Hawkins *et al.*, 2004:531)

According to Hawkins *et al.* (2004:530), seven sources of information are available to consumers (Figure 3.3). In addition, internal information can either be acquired actively or passively, whereas external information is acquired only actively. Furthermore, consumers decide how many and which sources of information to use. A purchasing decision requires a

subset of decisions concerning information seeking (Hawkins *et al.*, 2004:534). Internal information is the primary source mostly used by consumers. At some point, however, the individual consumer acquires information from an external source such as direct product experience or friends (Assael, 1995:229; Hawkins *et al.*, 2004:534; Cant *et al.*, 2006:198).

It is clear from Table 3.2 that sources of information may be categorised into marketer and non-marketer controlled sources (Assael, 1995:230; Hoyer & MacInnis, 2001:210-211; Sheth & Mittal, 2004:284; Cant *et al.*, 2006:198). One of the latest marketer controlled sources is the Internet. Today, more and more companies have opened a home page on the Internet (Hoyer & MacInnis, 2001:211; Hawkins *et al.*, 2004:523; Sheth & Mittal, 2004:284).

Table 3.2 External sources of consumer information (Assael, 1995:230; Hoyer & MacInnis, 2001:210-211; Sheth & Mittal, 2004:284; Cant *et al.*, 2006:198)

	Personal	**Impersonal**
Marketer controlled sources	Salespeople	Advertising
	Telemarketing	In-store displays
	Trade shows	Sales promotions
		Packaging
		Product brochures
		Company Web sites
Non-marketer controlled sources	Word-of-mouth from family and friends	Editorial and news material
	Professional advice / Product or service experts	Neutral sources such as consumer magazines, booklets and brochures
	Experience from consumption or prior experiences	Public information, news reports in the media, government publications
		Internet

In addition, the use of computers and satellites could make mass media more powerful and more accessible in future (Tansey & Worsley, 1995:182). Consumer friendly Web portals (search engines) such as Yahoo and Google can be customized to the individual preferences

of the user, and for those interested in a little more knowledge there are the Institute of Food Technologists (IFT) food science portal, the National Institute of Health, Food Advisory Consumer Service (FACS) (SA based) and many others. Greater access to diet and health resources is available through the Internet, magazines and other health related sources (Hollingsworth, 2003:20).

After conducting a key word search (Food additives and food additive labelling) on the Internet, the researcher selected a few examples of companies or governmental organisations and retailers with websites providing consumers with information about food additives and food additive labelling. This is for illustration purposes only, as the number of web addresses are far too many to mention. Examples include:

- Food and Drink Europe http://www.foodadndrinkeurope.com
- FACS http://www.foodfacts.org.za
- Food Standard Agency http://www.food.gov.uk
- EUFIC http://www.eufic.org/gb/food/pag/food27/food272.htm
- FAO http://www.fao.org
- Centre for consumer freedom http://www.consumerfreedom.com
- FSIS http://www.fsis.usda.gov
- Health Canada http://www.hc-sc.gc.ca
- Pick 'n Pay http://www.picknpay.co.za
- Women24 http://www.women24.com

Another important source of information is word-of-mouth. Word-of-mouth communication (Table 3.2) is where individuals share information with other individuals and are a critical influence on consumer decisions (Assael, 1995:634). Consumers learn about new products from their friends and other reference groups by observing them or participating with them as they use the product or by seeking or receiving advice from others before making a decision to buy products (Hawkins *et al.*, 2004:238). Communication within groups is a major source of information about certain products. It is a particularly important source when an individual consumer has a high level of purchasing involvement and a low level of product knowledge (Assael, 1995:633; Hanna & Wozniak, 2001:475; Hawkins *et al.*, 2004:239; Schiffman & Kanuk, 2004:310; Sheth & Mittal, 2004:11; Solomon, 2004:379-378). It is argued that word-

of-mouth is an important source of information for consumers interested in food additives. No research studies could be found about consumers' information sources to obtain information about food additives, thus the empirical part of the current study addresses this issue.

Furthermore, searching for information is not free. An information search involves mental as well as physical activities that consumers must perform. It takes time, energy, money and can often require giving up more desirable activities (Hanna & Wozniak, 2001:290). The benefits of an information search, however, often outweigh the cost of the search. Consumers also acquire a substantial amount of relevant information without a deliberate search, through low-involvement purchases (Hanna & Wozniak, 2001:290; Rousseau, 2003a:125; Hawkins *et al.*, 2004:528). It is argued that the cost of searching for information about food additives is high for consumers because consumers find food additive information such as E-numbers confusing and difficult to understand (Prättälä *et al.*, 1985:243; Crawford & Baghurst, 1990:231; Crowe *et al.*, 1992:20; Worsley, 1994:223; Abbott, 1997:47; Wandel, 1997:213; Kidd, 2000:55) and because it takes time to search for such information.

However, there are differences in the efforts required by consumers to obtain information from different sources and in the credibility of information (Peter & Olson, 2008:199). For example, Table 3.3 illustrates a model indicating five common sources of information and rates them on the dimensions of effort required and credibility. Apart from the consumers' involvement in an information search, there are also differences in the effort required by consumers to obtain information from different sources and in the credibility. The model predicts that internal sources (prior experiences stored in the memory) and personal sources (friends and relatives) are commonly used because they are readily believable (Peter & Olson, 2008:201). Marketing sources such as advertising would also be commonly used because it is readily available. However, marketing sources are not as believable because advertisers have something to gain from the transaction (Peter & Olson, 2008:201). Finally, public sources such as consumer reports and experiential sources such as personally testing the product are less likely to be used at an early stage of initial information search. That is because more effort is required to obtain information from these sources (Peter & Olson, 2008:201). Because no data about consumers' information sources' of food additives could be found, it

was suggested that participants in the present study could reveal some important perceptions about information sources (§ 6.3.3.9), although it was not one of the secondary objectives.

Peter and Olson (2008:200) used the term "believability" in the text. The correct English word is credibility and was, therefore, used by the researcher.

Table 3.3 A comparison of information sources (Peter & Olson, 2008:200)

Source	Effort required	Credibility
Internal (Stored experiences in memory)	Low	High
Personal (Friends, relatives)	Low	High
Marketing (Advertising)	Low	Low
Public (Consumer reports, other studies)	High	High
Experiential (Examining or testing product)	High	High

The model predicts that internal sources (prior experiences stored in the memory) and personal sources (friends and relatives) are commonly used because they are readily believable. Marketing sources such as advertising would also be commonly used because it is readily available. However, marketing sources are not as believable because advertisers have something to gain from the transaction. Finally, public sources such as consumer reports and experiential sources such as personally testing the product are less likely to be used at an early stage of initial information search. That is because more effort is required to obtain information from these sources (Peter & Olson, 2008:201). Because no data about consumers' information sources' of food additives could be found, it was suggested that participants in the present study could reveal some important perceptions about information sources (§ 6.3.3.9), although it was not one of the secondary objectives.

3.3.1.4 Limits of information acquisition

Consumers find the cost of information search and the complexity of information processing too great to attempt to consider all information available to them (Hoyer & MacInnis,

2001:211). Too much information can lead to information overload (Assael, 1995:231; Hoyer & MacInnis, 2001:211, Schiffman & Kanuk, 2004:551) or consumer burnout (Hollingsworth, 2000:54), resulting in confusion and consequently poor purchasing decisions (Schiffman & Kanuk, 2004:229). Furthermore, consumers trust food labels that show detailed ingredient lists, although they do not always understand the information completely. The danger exists that consumers think that they are making the right decision when they do so on the basis of a large amount of information. However, more information does not necessarily lead to better decisions. This is true in the case of information overload (Antonides & Van Raaij, 1998:258). It is questioned to what extent consumers in the present study experienced these limitations in their information acquisition about food additives.

3.3.2 Information processing

Once consumers have acquired information, they must process it. Marketers (and consumer educators) are interested in information processing, because it determines which information consumers remember, which information they use in the process of product choice, and how they use it (Assael, 1995:235). Furthermore, information processing is related to both the consumer's cognitive ability and the complexity of the information to be processed (Schiffman & Kanuk, 2004:226; Peter & Olson, 2008:51). Consumers with higher cognitive abilities apparently acquire more product information and are more capable of integrating information on several product attributes than consumers with lesser ability (Schiffman & Kanuk, 2004:226).

3.3.2.1 Model of high involvement information processing

The way in which consumers process information depends largely on the consumer's level of involvement with the product decision. Figure 3.4 presents a model of information processing for high involvement consumers, as food additive label readers are highly involved in information search and thus processing of this information. The importance of this model lies in the fact that it clearly illustrates the role of perception in information processing (Assael, 1995:235).

The high involvement information processing model is an extension of the description of information processing in complex decision-making (§ 3.4.1). Figure 3.4 shows that processing takes place as information is acquired. During the process the consumer acquired information. For example, a consumer might notice an advertisment about a food product containing no additives, perceive that it is better for health than an additive containing product and taste a sample in the shop, thereby realising that it tastes better than the product containing additives. Thus, this information is perceived by the consumer, that is, it attracts the consumer's attention (Assael, 1995:235).

The information about the better tasting additive free product is thus processed in the short-term memory. After this information is filtered by the short-term memory, only the most important and relevant information will be stored in the long-term memory, a process called selective retention (Assael, 1995:235; Hawkins *et al.*, 2004:278). Thereafter, the needed information will be retrieved from the long-term memory in the process of the evaluation of a food product free of food additives. At the same time past experiences about food additives can be obtained from past experiences which were stored in the long-term memory.

In the process of evaluation of a product free of food additives (Figure 3.4), the consumer assesses the degree of health risks or other risks (Tables 2.8 & 3.1) involved in the purchase. In this case the risk perceived by the consumer was that the additive free product was more expensive than one that contains additives. Such a risk encourages the consumer to seek additional information which is in turn filtered through perception and stored in the long-term memory (Assael, 1995:235) before making a purchasing decision. For instance the consumer will search for other additive free products available in the market at a lower cost.

Once the purchase is made and the product used, the consumer will also remember and learn from the purchase and use this experience for further purchases of the same or other products (Assael, 1995:235-236) free of food additives. It is important to note that perceived risk is an outcome of high involvement information processing and of particular importance to this study because consumers are concerned about the risks of food additives (§ 2.8).

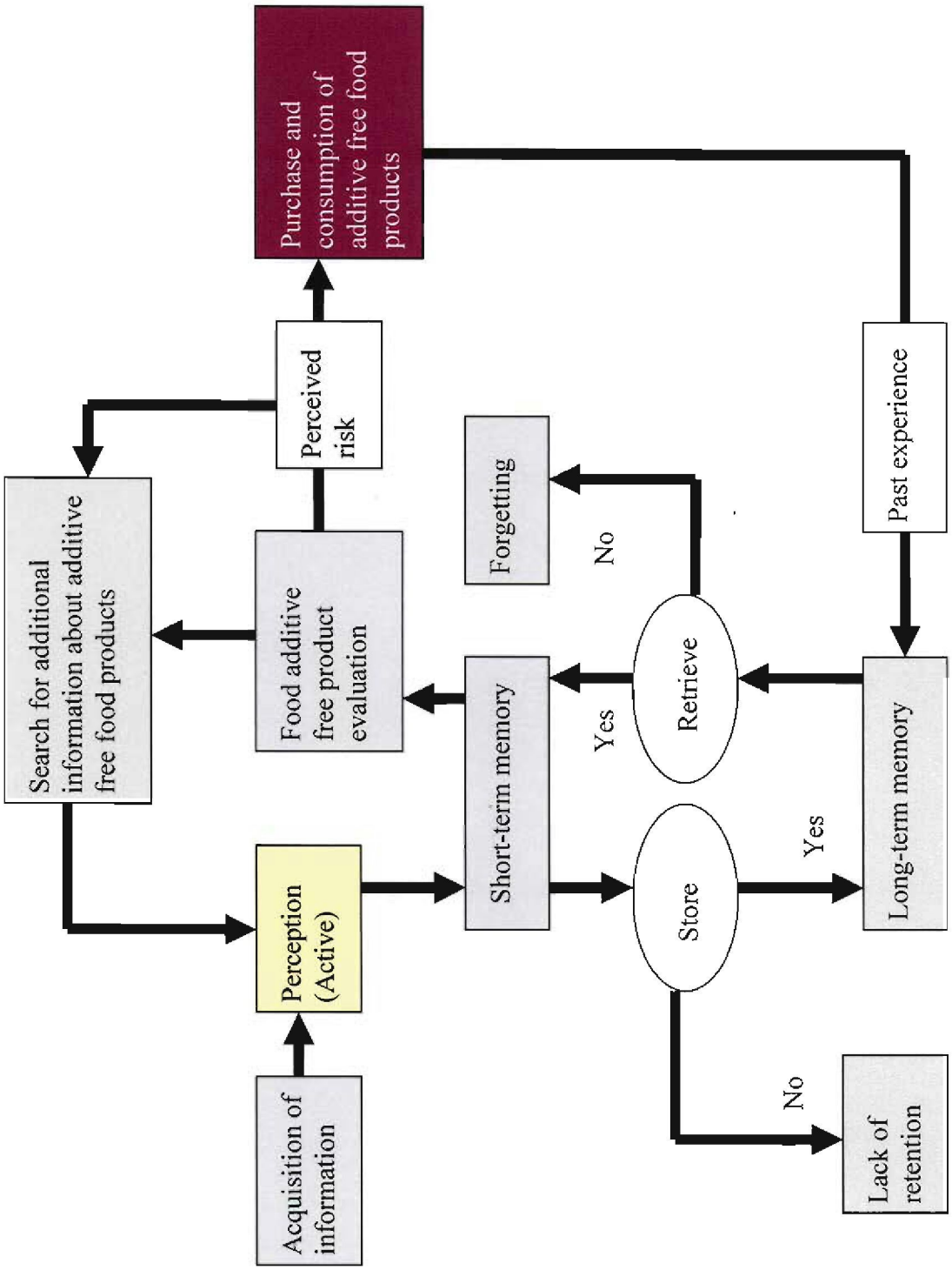


Figure 3.4 **A model of high involvement information processing (Adapted for food additives from Assael, (1995:236))**

3.3.2.2 Information processing for consumer decision-making

Information processing and decision processes play an important role in consumer behaviour (Antonides & Van Raaij, 1998:249). As mentioned before, perception constitutes three stages (§1.2), namely: exposure (§ 3.2.1), attention (§ 3.2.2) and interpretation (§ 3.2.3) (Matlin, 1983:2, 6; Feldman, 1996:101; Schiffman & Kanuk, 2004:186) as shown in Figure 3.5. These three stages can also be compared to Figure 3.1 and the steps previously discussed under the perceptual process (§ 3.2). Furthermore, the schemas formed during perceptual categorisation (§ 3.2.3.1) facilitate information processing, which implies the intake, storage in the memory, recognition and recalling of information (Antonides & Van Raaij, 1998:114). As can be seen in Figure 3.5, purchasing decisions are largely determined by how the consumer thinks and processes information (Foxall *et al.*, 2002:28). Feldman (1996:684) and Hawkins *et al.* (2004:278) defined information processing as a series of activities through which stimuli are perceived, transformed and stored.

Furthermore, Figure 3.1 and 3.6 suggest a linear following from exposure to memory. However, these processes occur virtually simultaneously and are clearly interactive (Hawkins *et al.*, 2004:279). That is, the memory influences the information exposed to, attends to and the interpretations assigned. At the same time memory is being shaped by the information it is receiving. In addition to the three steps previously described, Cant *et al.* (2006:116) indicate memory or recall as the fourth stage in the perceptual process, as mentioned before.

A new aspect of this model which was of significance in this study was the level of consumers' involvement ranging from low to high during the processes of attention and interpretation (Hawkins *et al.*, 2004:278) (Figure 3.5), where the previous model (§ 3.3.2.1) focused only on high involvement information processing. It is argued by the researcher that some consumers might be highly involved whilst other consumers might have low levels of involvement with the processing of food additive information. The model in Chapter 4 (Figure 4.1) and the model adapted in Chapter 7 (Figure7.1) might shed some light on consumers' involvement with food additive information discussed in sections 4.4.4 and 7.2.6.

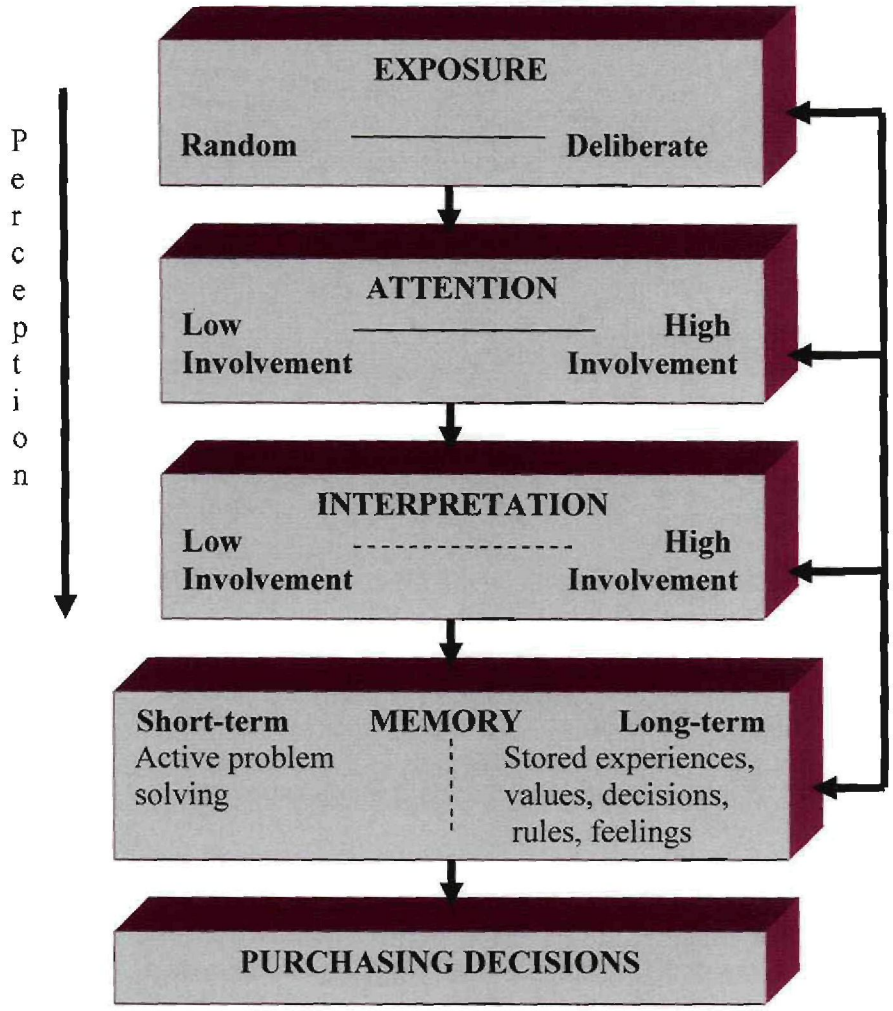


Figure 3.5 Information processing for consumer decision-making (Hawkins *et al.*, 2004:278)

In the next section, memory (Figure 3.5), another aspect of information processing by consumers is discussed.

3.3.2.3 Memory processes during information processing

Memory consists of two interrelated components, the short-term and long-term memory. The short-term memory is the working memory (Hawkins *et al.*, 2004:334). The term perceptual learning refers to changes in the brain that alter how consumers process sensory information

(Ahissar, 1999:124). Information most commonly goes directly into the short-term memory for problem-solving or elaboration. Elaborative (§ 3.2.3) activities are the use of previously stored experiences, beliefs, values and feelings to interpret and evaluate information in the working memory as well as to add relevant previously stored information (long-term memory). Thus the interpretation stage of perception is based on elaborative activities (Hawkins *et al.*, 2004:334). For example, a consumer knows that yellow soft drinks contain tartrazine and the consumer believes that tartrazine causes hyperactivity and values the health of his/her child. When this consumer considers buying a new brand of soft dink for the child, he/she will use the previously stored information to evaluate the label information in order to find out whether the product indeed contains tartrazine. If it does contain tartrazine then the consumer will interpret the information and conclude that the product can cause hyperactivity. Memory is the short-term use of the meaning (stimuli) for immediate decision-making or the longer-term retention of meaning (Hawkins *et al.*, 2004:284, 287; Schiffman & Kanuk, 2004:228).

The knowledge stored in the memory is a major determinant of comprehension. According to Peter and Olson, (2008:12), refers comprehension to the interpretation process through which consumers understand or make sense of their own behaviours and relevant aspects of their environment. Furthermore, knowledge enhances consumers' ability to understand a message. For example, if consumers do not have the knowledge that E102 is tartrazine, then they will not be able to avoid such products containing the food additive. In addition, a consumer's ability to comprehend information is largely determined by their existing knowledge in the memory (Peter & Olson, 2008:124). Knowledge can help consumers recognise faulty logic and erroneous conclusions and avoid incorrect interpretations. Knowledgeable persons are more likely to elaborate on message claims, whereas unknowledgeable consumers may focus on non-claim cues (such as pictures or packaging) within the message (Engel *et al.*, 1993:408). For example, a knowledgeable person (knows that E102 stands for tartrazine) will evaluate a yellow coloured soft dink by reading the label to search for the E-number, whilst an unknowledgeable person will see that product is yellow in colour and assume that it is bad for their health.

Memory is extremely selective (Antonides & Van Raaij, 1998:120; Hawkins *et al.*, 2004:285). Of the limited amount of information to which the individual is exposed, only a relatively small percentage is attended to and passed on to the central processing part of the brain for interpretation. The meaning assigned to a stimulus is as much or more a function of the individual consumer than it is of the stimulus itself. Moreover, much of the interpreted information will not be available to the active memory when the individual needs to make a purchasing decision (Hawkins *et al.*, 2004:285). That means that even if consumers were exposed to, paid attention to and interpreted that E102 stands for tartrazine, they will not necessarily remember it when selecting food products.

In the next section the complex decision-making model and how information processing fits into the models are discussed. The model was selected in order to explain some of the important factors of consumer decision-making when consumers select food products containing food additives.

3.4 CONSUMER DECISION-MAKING

A consumer approaches a product decision as a problem-solving process (Solomon, 2004:227; Cant *et al.*, 2006:195). First beliefs are formed about the product (such as yellow coloured soft drinks are bad for health) by accumulating knowledge (beliefs) regarding relevant attributes (such as it contains the yellow colourant tartrazine). Next the consumers evaluate these beliefs and form a feeling about the product (affect) (I hate yellow coloured soft drinks). Finally, based on this evaluation the consumer engages in a relevant behaviour such as buying or not buying the product. The standard learning hierarchy assumes that a consumer is highly involved in making a purchasing decision. It is argued in the present study that consumers who are avoiding food additives are mostly highly involved in making a purchasing decision. The person is motivated to seek out a significant amount of information, carefully weigh alternatives and come to a thoughtful decision (Solomon, 2004:228).

Consumers are continuously making decisions about what products to consume. Consumer decision-making is very similar to problem-solving. A decision or a solution is a course of

action that provides a desired result to a perceived state of a particular consumer. Perception is the whole process through which individuals become aware of the environment and interpret it so that it will be congruent with their own frame of reference. A problem occurs only when consumers perceive a difference between their present situation and what they want (Cant *et al.*, 2006:193). A consumer perceives a problem that a food additive he/she is using regularly (such as saccharine) can cause cancer and thus wants to avoid it.

3.4.1 Complex decision-making process

Consumer decisions result from perceived problems (Cant *et al.*, 2006:25). Consumer's complex decision-making (§ 3.3.2.1) encompasses two sets of influencing variables namely individual and environmental (Rousseau, 2003a:109). The present study focuses only on the individual factor of perception because it was identified in the objectives (§ 1.3) of the present study. The presentation of the complex-decision-making model must be seen as complementary to previous discussed models of high involvement processing (§ 3.3.2.1) and the model of information processing for consumer decision-making (§ 3.3.2.2). This model represents a different approach from the two above mentioned information processing models as it serves to illustrate the decision-making process and purchasing situation of a consumer for a specific product group (such as foods containing additives).

It is important to note that not all consumer decisions are rational. Consumers often purchase goods for non-rational reasons, such as fear (for example, a diabetic person continues to purchase sugar because of a fear that saccharine can cause cancer). These non-rational or emotional purchase motives imply that a choice is based on personal or subjective criteria (Rousseau, 2003a:110). It is suggested by the researcher of the present study that consumers making decisions about food containing additives will follow a complex decision-making process as illustrated by Rousseau (2003a:113), because it is associated with health risks (Table 3.1). The complex decision-making model of Rousseau (2003a:114) was chosen for this study because it indicated how consumers evaluate products in a more detailed and comprehensive manner. The model further indicated that more information is sought and

more products are evaluated by consumers. Such a process is most likely to take place in the case of products associated with high risks such as food additives containing food products.

Rousseau (2003a:113) identified six stages (Figure 3.6) in the process of complex decision-making namely:

- problem recognition;
- blocking mechanisms;
- information search and processing;
- expected outcomes and intentions;
- response; and
- post-purchase response.

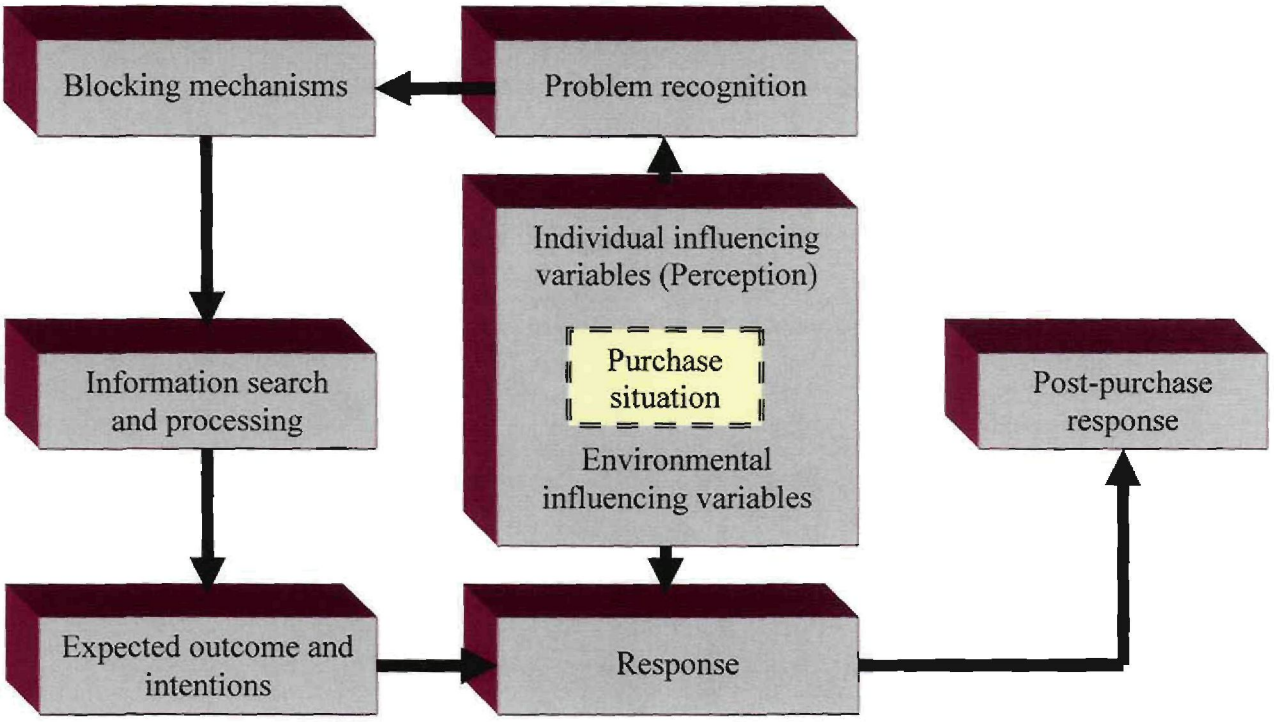


Figure 3.6 Stages in the process of complex decision–making (Rousseau, 1994:47; Rousseau, 2003a:114)

These stages and the sequence in the process are illustrated in Figure 3.6. Only the first two steps are discussed in detail because these aspects are used in the proposed model of

consumers' perceptions about food additives and consequent purchasing behaviour (§ 3.4.1.1 & 3.4.1.2). Step 3 was discussed in section 3.3. Step 4 and 5 is discussed in the next section (§ 3.5). According to the primary objective of this study (§ 1.3.1), post-purchase response was not investigated, therefore, it was excluded from this discussion.

3.4.1.1 Problem recognition

The first stage in the complex decision-making process is problem recognition (Rousseau, 2003a:117; Hawkins *et al.*, 2004:504; Cant *et al.*, 2006:195). A problem exists when a consumer has some purchasing needs and it is uncertain how to satisfy them (Rousseau, 2003a:117). In other words problem recognition is also an awareness of the need to change the existing state to conform to the desired or ideal state (Cant *et al.*, 2006:195). Hawkins *et al.* (2004:504) define problem recognition as the result of a discrepancy between a desired state and an actual state that is sufficient to arouse and activate the decision process. An actual state is the way an individual perceives his or her feelings and situation to be present time (Hawkins *et al.*, 2004:504). An actual state consumer is a person who perceives that he/she has a problem when a product fails to perform satisfactory (Schiffman & Kanuk, 2004:556) such as an additive free fruit juice that starts to ferment and turn sour. A desired state is the way individual consumers want to feel or be at the present time (Hawkins *et al.*, 2004:504). Such consumers desired something new and may trigger the decision-making process (Schiffman & Kanuk, 2004:556), for example, a mother who wants to avoid tartrazine due to her child's reaction towards such products.

Furthermore, problem recognition can be related to all six stages of the decision-making process. For example, problems related to whether a product is needed, where to find the money or back-up service to buy (blocking mechanisms), what to buy (information search and processing), when to buy (expected outcome and intentions), how to buy (with cash or credit) or how to postpone the purchase (response) and whether to be satisfied or dissatisfied with the product (post-purchase response) (Rousseau, 2003a:117).

3.4.1.2 Blocking mechanisms

The second stage in the decision-making process involves overcoming the blocking mechanisms of the process (Rousseau, 2003a:117). The tendency of consumers to block threatening or contradictory stimuli (thus consumers developed blocking mechanisms) (§ 3.2.4.2) from their conscious processing is known as perceptual defense (Hanna & Wozniak, 2001:111; Rousseau & Spoelstra, 2003:223). Of the individual determinants, distorted perceptions probably have a direct effect as blocking mechanisms (Rousseau, 2003a:115). Apart from stemming from the internal barriers of perception (such as tartrazine causes hyperactivity), blocking mechanisms can also stem from external barriers, for example, a lack of funds (tartrazine free food are expensive). Similar to problem recognition, blocking mechanisms can occur at various stages in the decision-making process (Rousseau, 2003a:117). They include unavailability of a product (such as all yellow soft drinks contains tartrazine) or the need for more information certainty about an expected outcome (such as the uncertainty that additives do indeed causes cancer), due to unforeseen circumstances, incapability of making a decision and having no criteria on which to base post-purchase assessment (Rousseau, 2003a:117; Cant *et al.*, 2006:196).

3.4.1.3 Information search and processing

The third stage in the consumer decision-making process is the search for information and the organisation of this information within the individual's frame of reference (Rousseau, 2003a:117). As mentioned previously it involves searching for and processing information (§ 3.3) from various sources. The importance of this model in the context of the present study is that it explains what factors can block a consumer's purchasing behaviour. The researcher predicts that various blocking mechanisms can influence consumers purchasing behaviour of food containing additives and it was expected that the empirical study could reveal such blocking mechanisms. In the last section of this chapter the focus will be on the outcomes of an evaluation about a product leading to an intention to purchase the product in question.

3.5 OUTCOMES, INTENTIONS AND PURCHASING BEHAVIOUR

The outcome of a product evaluation is an intention to buy or not to buy (Assael, 1995, 93). Purchasing is a form of decision-making (Tansey & Worsley, 1995:157). Similarly, Assael (1995:610) indicated that consumer decision-making lead to purchasing behaviour. Sheth *et al.* (1999:554) further argue that the principles of decision-making can be combined with the principles of perception and problem-solving which leads to a choice and purchasing decision and ultimately to a purchase. Thus, purchasing behaviour is the result of a set of cognitions about, and evaluations of various products (or ingredients such as food additives), which then lead to a choice (choose a tartrazine free product), a purchasing decision (decide to purchase a tartrazine free product) and ultimately to purchasing behaviour (buy the product free of tartrazine or do not buy a product containing tartrazine).

Similarly, Rousseau (2003a:117) indicated that the fourth stage in the consumer decision-making process (Figure 3.6) is the evaluation of criteria in order to determine the expected outcome of a purchasing decision. At this stage consumers identify alternative solutions to a problem and determine the relative merits of each. In terms of food additives it means, for example, that consumers who want to select a soft drink free of tartrazine, identify alternatives such as 100% pure orange juice and a fruit juice blend. The evaluation criteria for the 100% pure fruit juice can be, for instance, its expensive price, it short shelf life and that it tastes too sour. The evaluation criteria for the fruit juice blend can be that it contains deflavoured apple juice, added sugar, is cheaper than the 100% fruit juice and has a preservative. This is a critical stage in consumer decision-making, because consumers are not always able to make rational decisions by weighing up alternatives (Rousseau, 2003a:117). From the example it can be seen that the consumers confronted with a complex choice have to consider various criteria before a product free of tartrazine can be chosen.

The next stage in the decision-making process (Figure 3.6) is the consumer's response, which involves choosing the most desirable alternative, in other words, to buy or not to buy (Rousseau, 2003a:117). Consumers purchase the product most likely to satisfy their needs (Assael, 1995:104). In habitual purchasing behaviour consumers are satisfied with the product over time (past experience) and will buy it again with little information search (Assael,

1995:125). For example, a consumer who always buys 100% pure orange juice that contains no additives. The consumer knows form past experience that the product satisfy his/her needs and does not need to read the label for additive information every time he/she is buying the product. In terms of the present study (Assael, 1995:612), consumer decision-making process can be interpreted as follows: the situation of the consumer (for example, a hyperactive child), the product (for example, yellow coloured soft drinks) and the consumer itself (for example, the mother) are key variables that might influence purchasing behaviour.

Moreover, perception can have a profound effect on purchasing behaviour (Coon, 2006:201). Perception is the gateway for all incoming information (Sheth *et al.*, 1999:554). The perceptual process is concerned with "how" the information from, for instance, external sources is registered and coded by the consumer (Schiffman & Kanuk, 2004:555). Moreover, the perceptual process is influenced by prior-knowledge, which includes expectations which result in selective attention being given to incoming information. Thus, there is a biased interpretation thereof (Sheth *et al.*, 1999:554). The results are as mentioned before a set of cognitions about and evaluations of various products (or food additives), which then leads to a choice, a purchasing decision and ultimately to purchasing behaviour (Sheth *et al.*, 1999:554). Finally the objective of purchasing behaviour is to increase consumer satisfaction (Schiffman & Kanuk, 2004:569).

3.6 SYNOPSIS

Perception can be described as the process that consumers use to receive information (stimuli) such as a food additive claim through the five senses and then assign meaning to this information. Selection, organisation and interpretation are the three basic processes underlying consumer perception. The principles of selective perception include selective exposure and selective attention. Selective perception serves to guide consumers in selecting information about food additives that is relevant (such as information about MSG) and in screening out information that is not relevant to their needs (for example, what E-numbers stand for). This process is known as perceptual vigilance. Furthermore, selective perception

permits consumers to select information that conforms to their beliefs (such as additives are bad for health) and predispositions about products (such as food additives cause cancer).

Consumers differ in their perception of reality depending on their own experiences, life history and personal situations. Consumers organise their perceptions into unified wholes according to the principle of the Gestalt theory. The interpretation process requires the exposure to information (such as the food additive MSG on the ingredient list of a food product label) and involves the cognitive process of attention and comprehension. Therefore, perceptions might be inaccurate or distorted interpretations of reality (such as food additives are chemicals and chemicals are poisonous, thus all food additives are poisonous). Selectivity is necessary to survive in a world that offers an overload of information to consumers. However, such selective perceptions do make it possible to miss out on less remarkable, less eye-catching, but nevertheless relevant information (such as the small font of the ingredient list on a label displaying food additive information). Consumers make decisions and purchase goods based on what they perceive to be reality.

An important part of any consumer's decision process is the acquisition and processing of information (such are reading food additive information on a food label or to ask a friend about it). In any purchasing situation, individual consumers absorb information from their external environment (such as food labels on food products containing additives) and integrate or combine it with their inner needs, motives and perceptions (such as a consumer who want soft drinks free of yellow colourant to give to his/her hyperactive child).

Consumers will acquire more information (search for more information about tartrazine on the Internet) about products if they are involved in the purchase, see risk in purchasing (additives are bad for health) and have little product knowledge (do not know what the E-numbers stand for). However, information acquisition is limited by the amount of information a consumer can process (a consumer does not know everything about tartrazine). Once consumers acquired information they must process it. To process information, consumers must be able to retain it in and retrieve it from the memory. The short-term memory acts as a filter to determine what information will be retained in the long-term memory (such as a consumer who only knows that E102 stands for tartrazine but does not know all the other E-

numbers). The information stored in the long-term memory is organised into schemata, which represent the sets of associations consumers have with products.

Complex decision-making occurs when consumers are involved with the product and goes through an extensive decision-making process to arrive at a choice. The decision-making process involves problem recognition, blocking mechanisms, information search and processing, expected outcomes and intentions, response and post-purchase response. A consumer finally decides whether or not to purchase a product containing food additives such as tartrazine.

In the next chapter a model is proposed to investigate how consumers utilise their food additive perceptions gained form various information sources (including food labels) to make purchasing decisions. It illustrates how consumer involvement influences consequent purchasing behaviour by applying the ELM of persuasive communication.

CHAPTER 4

PROPOSED MODEL TO EXPLAIN CONSUMER'S FOOD ADDITIVE PERCEPTIONS

4.1 INTRODUCTION

The preceding review of the literature (Chapters 2 and 3) was used to construct a conceptual framework about consumer's food purchasing behaviour as it is influenced by labelling and other information sources about food additives. The objective (§ 1.3.2) of this chapter is to apply the Elaboration Likelihood Model (ELM) of persuasion on consumers' perceptions of food additives labelling theoretically in order to explain how consumer information processing influences consumer decision-making and consequent purchasing behaviour of food products containing additives. The suggested model, specifically built on Petty and Cacioppo's (1986) ELM to explain consumer information processing and consequent purchasing behaviour of food products containing additives (Annexure A). Wright (1997:417) applied the ELM to food additive labelling, focusing on specific brands in order to improve marketing communications. However, it is argued that to understand consumers' food additive label reading behaviour fully, the focus of research should be from a general consumer point of view. The viewpoints of manufacturers about selected branded products do not provide a complete picture about consumers' perceptions of food additives. Brands are not the only product attribute influencing consumer's perceptions about a product (Solomon, 2004:75). Furthermore, Nancarrow *et al.* (1998:114) argue that some understanding of the perceptual processes of consumers could help to design labels that communicate the message in an appealing way.

The increased marketing of processed foods containing food additives and the concern consumers express with regard to the risks (§ 2.8) of food additives call for the development of a theoretical basis for research into the consumers' perception of food additive labelling.

4.2 THE RELEVANCE OF APPLYING THE ELABORATION LIKELIHOOD MODEL TO FOOD LABELLING AND ADVERTISING

The ELM has contributed greatly to an understanding of how consumers are persuaded when messages are encountered (Solomon, 2004:282). Davies and Wright (1994:57) and Wright (1997:417) applied the ELM to explore the importance of effective labelling of branded products in food marketing (Figure 1.1) (§ 1.2). The results indicate that consumers have difficulties processing information on a label due to the complexity of phrases such as E-numbers. A lack of standardisation of ingredient terms, for example, the inconsistent use of chemical names versus E-numbers and misleading claims about products, complicate the situation for consumers. Therefore, the ELM could provide some guidance for examining the way consumers react to the marketing communication methods such as messages on labels (Nancarrow *et al.,* 1998:111) adapted by food manufacturers and their advertisers.

Apart from consumers' ability to understand messages, Updegraff *et al.* (2007:250) draw from the ELM to examine the role of message scrutiny on tailored health messages. The findings suggest that tailoring health messages to increase its effectiveness is driven in part by the increased cognitive elaboration afforded to messages that match important concerns and characteristics of consumers. Because some consumers perceive that food additives might hold some health risks (Kajanne & Pirttilä-Backman, 1996:208; Bruhn, 2002:102), message scrutiny is important to food additive label reading consumers.

Bredahl *et al.* (1998:269), on the other hand, used the ELM to demonstrate the significant impact of the credibility of information sources on consumers' behaviour about genetically engineered food. These researchers believe that the impact of various sources of information on consumer acceptance is likely to be influenced both by factors relating to the information itself (for example, contents, style, such as chemical names versus E-numbers) and factors relating to the sender of the information (for example, food manufacturing industry, consumer organisations or government). Thus, the ELM can be used to explain how perceptions towards food additives are affected by various information strategies.

In addition, the ELM suggests that vastly different information strategies are required to communicate effectively to consumers who are highly involved with the product when compared to consumers with little product involvement (Hawkins *et al.*, 2004:400). It means that in general more detail, factual and logic information about food additives can be used when consumers are highly involved with food additives. Furthermore, it might indicate a need for more information about food additives on product labels for the food additive label reading segment of the population.

Support for focusing on different consumer segments in food label reading can be found in a report by Paterson *et al.* (2003:31-33) on food labelling issues. Segmentation results can assist in the development of food label standards and education strategies. Paterson *et al.* (2003:31) indicate two key factors to play a role in the characterisation of consumer segments. The first factor is the motivation of the consumer and the reasons behind the motivation. The second factor is the consumer's capacity to use label elements including their prior experience using labels. The ELM specifically focuses on both of these factors (Petty & Cacioppo, 1984:676). Motivational factors include aspects such as:

- how health conscious a consumer is;
- the selection of foods for a special health need;
- consumers interest in food label information; and
- consumers perceived importance and usefulness of food label information (Paterson *et al.*, 2003:31-33).

Capacity, on the other hand, refers to the consumer's success or ability in:

- finding food label information;
- having sufficient time to read labels while shopping; and
- their perceptions of how clear and trustworthy the label information is (Paterson *et al.*, 2003:31).

The above examples serve to illustrate that the ELM of persuasion can be useful to explain the impact of the different factors on consumer's perceptions systematically about food additive labelling, logos, endorsements, claims and ingredient lists (Davies & Wright, 1994:65) and how it influences consumers' decision-making process and consequent purchasing behaviour.

4.3 CONSUMERS' PERCEPTUAL PROCESS WITH REGARDS TO FOOD ADDITIVE INFORMATION

The reaction of a consumer towards product attributes is based upon their perception of the particular product and not on the basis of their objective reality (Schiffman & Kanuk, 2004:168). For example, a consumer will not buy yellow-coloured soft drinks because they perceive that the product containing tartrazine causes hyperactivity. Perception is what a consumer observes through the human senses of sight, smell, taste, hearing and touch after receiving an impulse from the environment (Assael, 1995:225; Solomon, 2004:49). Such impulses can be food additive advertising, ingredient lists on labels, food additive claims, and colour of food. These impulses can also be called a stimulus or a sensory input (Du Plessis, 1994:89; Solomon, 2004:49). Another type of input is provided by the individual themselves in the form of expectations, motives and learning, based on previous experience (Schiffman & Kanuk, 2004:171). Thus consumer perceptions about additives are more important than their factual knowledge of food additives, as perceptions affect consumers' purchasing actions (Drew, 1999:165). Because consumers made decisions and take actions based on what they perceive to be reality, the focus will be on the notion of perception and its related concepts in order to determine what factors influence consumers to solve problems (Antonides & Van Raaij, 1998:109; Cant *et al.*, 2006:115) and purchase products (Rowley, 1997:85; Hawkins *et al.*, 2004:291; McNeill & Crotts, 2006:72).

What is seen and felt and the meaning that consumers assign to it, is filtered through their perception, which explains why different consumers may describe seemingly same objects or occurrences uniquely, which is referred to as selective perception. Thus all consumers look at the world differently (Antonides & Van Raaij, 1998:117; Piggott & Paterson, 1999:29). Consumers may screen out or modify information presented if it is in conflict with their previously learned behaviours, beliefs (Assael, 1995:225; Schiffman & Kanuk, 2004:172; Sheth & Mittal, 2004:133; Solomon, 2004:59; McNeill & Crotts, 2006:69), personal situations (Antonides & Van Raaij, 1998:109), personal aspirations and pressures imposed by their peers and environment. If manufacturers are to produce additive containing products it is important to understand the factors influencing consumers' individual world and to know how their products are being perceived (Piggott & Paterson, 1999:29).

The stimuli consumers perceive are often ambiguous. Perception is selective and consumers interpret stimuli according to their unique personalities, expectations, biases and needs, and is based on consumers personal past experiences and existing perceptions (Tansey & Worsley, 1995:184; Solomon, 2004:59; Cant *et al.*, 2006:115). Perception (§ 3.2) is constituted out of three stages, namely: exposure, attention and interpretation of perceptual stimuli (Matlin, 1983:2, 6; Feldman, 1996:101; Schiffman & Kanuk 2004:158), which ultimately influences consumers' purchasing decisions (Engel *et al.*, 1993: 432; Hawkins *et al.,* 2004:278). Each of the three stages of perception formation can be linked to the ELM.

The ELM assumes that once a consumer receives a stimuli or a message, he/she begins to process it (Hawkins *et al.,* 2004:400; Solomon, 2004:282). The processing of information requires that consumers perceive, transform, store and remember information. Perception is, therefore, a key component in information processing (Jordaan *et al.,* 1975:315; Assael, 1995:161), problem-solving (Cant *et al.*, 2006:114) and the consumer's decision-making process (Schiffman & Kanuk, 2004:199) that drive purchasing behaviour (Engel *et al.*, 1993:432).

4.4 APPLYING THE ELABORATION LIKELIHOOD MODEL SEQUENCE TO CONSUMERS' FOOD ADDITIVE PERCEPTIONS

A diagrammatic representation in Figure 4.1 of a consumer's decision-making process is provided by applying Petty and Cacioppo's (1986:4) (Annexure A), Wright's (1997:417) (Figure 1.1 § 1.2) and Solomon's (2004:282) ELMs. The model illustrates the sequence of stages in consumer behaviour ranging from exposure to stimuli, such as the food additive containing product, information search, reception of food additive claims and food additives content of the ingredient list, stimuli processing though the central or peripheral route to persuasion, attention, comprehension and ultimately to belief, perception and behaviour change.

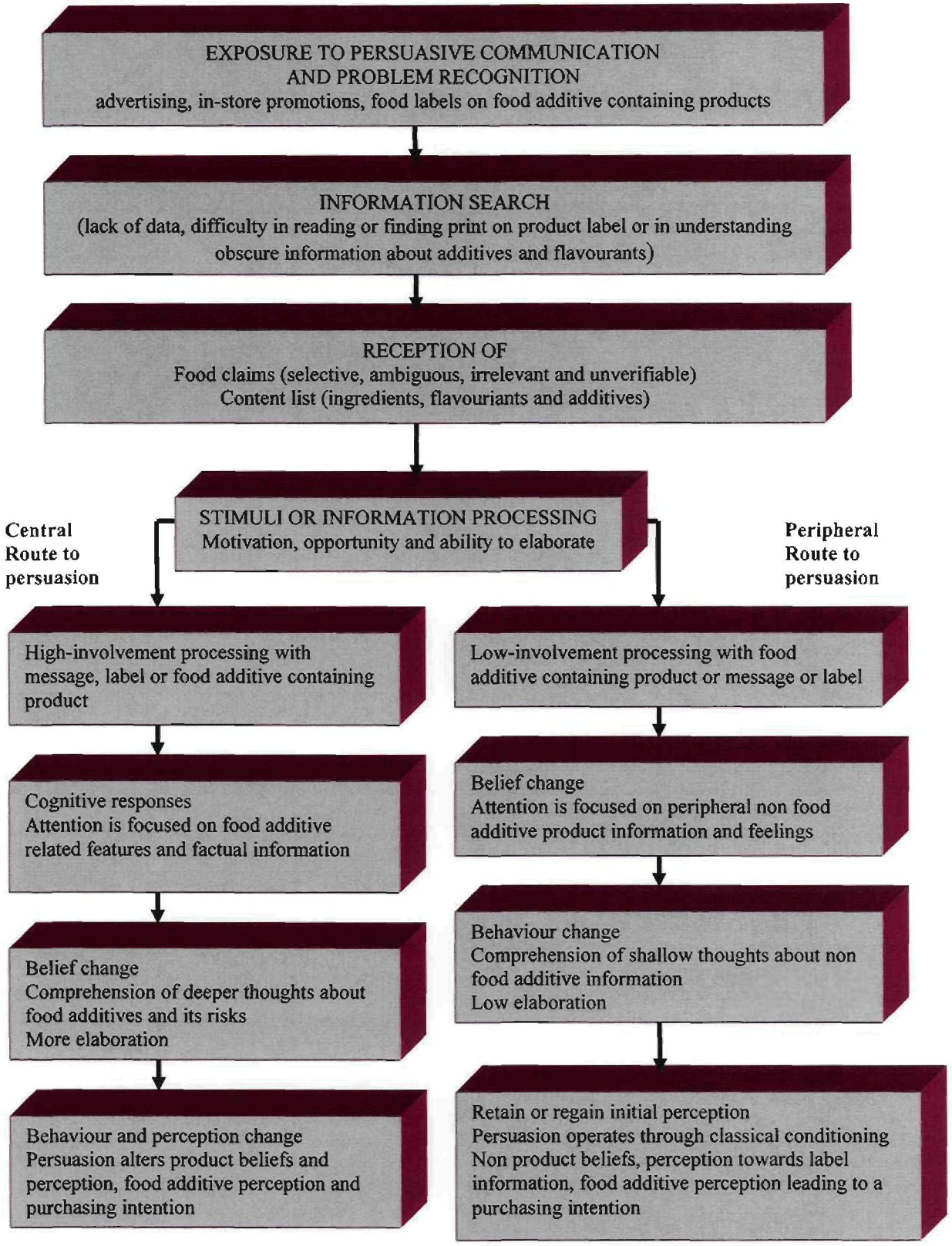


Figure 4.1 **Applying the Elaboration Likelihood Model sequence to consumers' food additive perceptions (Adapted from Petty and Cacioppo (1986:4), Wright (1997:425), Hawkins *et al.* (2004:400), Solomon (2004:282) and Peter and Olson (2008:428))**

The ELM explains how individual and situational differences among consumers determine how much cognitive effort a consumer devotes to a stimuli, information contents or promotional aspects of an advertisement or label content in order to processes the message (Petty & Cacioppo, 1984:679; Bredahl *et al.,* 1998:271), which ultimately influences purchasing behaviour (Assael, 1995:94-95).

4.4.1 Exposure to food additive containing products and information

The ELM as shown in Figure 4.1, deals explicitly with exposure to persuasive communication (Petty & Cacioppo, 1986:4). When a stimulus, such as tartrazine, a food additive listed on a food label, comes within the range of sensory receptor nerves, exposure (Hanna & Wozniak, 2001:197; Hawkins *et al.,* 2004:279; Solomon, 2004:282; Peter & Olson, 2008:166), or problem recognition (Hawkins *et al.*, 2004:249, 502; Rousseau, 2003a:114; Sheth & Mittal, 2004:275; Solomon, 2004:293; Cant *et al.*, 2006:193; Peter & Olson, 2008:169) occurs. Consumers are exposed to food additives and products containing additives by means of different information sources, such as health leaflets (Hawkins *et al.,* 2004:531), the Internet (Peter & Olson, 2008:429), mass media (Sloan *et al.*, 1986:524; Kajanne & Pirttilä-Backman, 1996:208), in-store promotions, advertising (Hawkins *et al.,* 2004:531) and food labelling (Wright, 1997:418). Consumers can concentrate on some stimuli, are unaware of others or even go out of their way to ignore some messages (Assael, 1995:225; Hawkins *et al.*, 2004:279; Solomon, 2004:65).

In general consumers concentrate only on a small portion of the stimuli to which they are exposed. It is called the process of selective perception (§ 3.2.4) (Assael, 1995:199; Schiffman & Kanuk, 2004:168; Solomon, 2004:65). This means that consumers are more likely to be aware of stimuli that relate to their current needs. For example, consumers with diabetes may be more aware of sweeteners and search for information about both artificial and natural sweeteners. Consumers can also see what they want to see and do not see what they do not want to see (Solomon, 2004:65). Drew's (1999:167) argument serves as an example to explain this phenomenon that consumers see what they want to see. Drew

(1999:167) argues that consumers are concerned that "artificial food ingredients are chemicals, chemicals cause cancer and thus artificial food ingredients can cause cancer".

Consumers are not only exposed to food additive information, but at the same time they might be aware of food additives that can cause health risks such as cancer (Prättälä *et al.*, 1985:240; Bruhn, 2002:102; Paterson, 2002:4; Williams *et al.*, 2004:35). In addition, some consumers gave the main reason for looking for food additive information as allergies (Young, 1997:112). The consumer thus perceived that there is a health problem to be solved (Solomon 2004:72). Problem recognition is the first stage in the consumer decision process (Hawkins *et al.*, 2004:279) and can occur in two ways (Sheth & Mittal, 2004:279). Internal stimuli are the perceived state of discomfort and can be physical or psychological (Sheth & Mittal, 2004:279), for example, an adverse respiratory reaction caused by food additives such as sulphites or a food additive allergy caused by tartrazine (Bruhn, 2002:102). External stimuli are market place information items that lead the consumer to realise the problem, for example, food additive scares (Anon., 2005b:2). Once a stimulus or health problem about food additives has been recognised, consumers need sufficient information to resolve the problem (Solomon, 2004:296).

4.4.2 Search for food additive information

Generally consumers seek information (§ 3.3.1) that will assist them in achieving their goals or satisfy their needs and wants (Assael, 1995:161; Solomon, 2004:296; Cant *et al.*, 2006:196) or to solve a problem (Hawkins *et al.*, 2004:526). The information search (Figure 4.1) is selective, because consumers choose information that is most relevant to their needs and most likely to conform to their beliefs (Rousseau, 2003a:118). Consumers may search for more information about the product under investigation by reading the ingredient list on the label, or searching for claims such as "tartrazine free". As shown in Figure 4.1, the information search can be hampered by a lack of information on a food label (Crowe *et al.*, 1992:19), a lack of standardisation in product labelling (Davies & Wright, 1994:61; Wright, 1997:419), legibility of the ingredient list, legibility of the nutrition information (Whiteley, 2000:207) and understanding of the language (Worsley, 1994:225; Whiteley, 2000:210) and

terms used on the label (Crowe *et al.*, 1992:20; Worsley, 1994:225; Wandel, 1997:218). There is a growing demand for additional information about food, additives and nutrition (Crawford & Worsley, 1986:76; Crawford & Baghurst, 1990:231; Worsley, 1996:71), as well as for clarification of some of the existing label information (Wandel, 1997:217; Worsley, 1994:223; FAC, 2002:6). New information sources enable an ever-increasing amount of information to be provided in a variety of ways. For example, the Internet offers almost limitless opportunities to obtain additional food additive information (FAC, 2002:10; Williams *et al.*, 2004:32). It is also quite reasonable that consumers believe that they are entitled to know about every ingredient in food when exercising a choice (FAC, 2002:48). Thus dissemination of food additive information is an important factor that will influence consumers' purchasing behaviour.

Furthermore, the consumer's perception that a food additive might be risky (Sloan *et al.*, 1986:523; McNutt *et al.*, 1986:75; Wandel, 1997:216; Bruhn, 2002:102; Williams *et al.*, 2004:35), is actually an outcome of information processing that could lead consumers to acquire additional information (Assael, 1995:161; Sheth & Mittal, 2004:365). The two-component model of risk perception consists of the uncertainty about the outcome (for example, what are the chances that the food additive present in the product will cause hyperactivity in my child?) of the decision and concern about the consequences (have a child with learning problems) of the decision (Assael, 1995:89; Solomon, 2004:304). Furthermore, perceived risks are important elements in product involvement (Peter & Olson, 2008:74) and are a determinant of the amount of information the consumer searches for (Sheth & Mittal, 2004:365) and subsequent purchasing behaviour (Yeung & Morris, 2001:178). Results of research on food additives indicated that consumers indeed want more detailed food additive information (Worsley, 1994:227; Wandel, 1997:218, Bruhn, 2002:103), detail on quantities of food additives (Crawford & Baghurst, 1990:232), functions and side effects of individual food additives (Bruhn, 2002:103) on labels.

Information, such as product labelling, leaflets, free samples, word-of-mouth and endorsements, is an important risk reliever (Yeung & Morris, 2001:181). In order to reduce risk, consumers tend to rely on sources of information with a high degree of credibility such as friends (Assael, 1995:161). Moreover, a higher perceived risk is associated with an

increased search and greater reliance on personal sources of information and personal experiences (Hawkins *et al.*, 2004:542).

In addition, consumers who are highly involved with a specific additive, generally seek information relevant to the additive on an ongoing basis (Wang & Fletcher, 1995:363). Consumers' search for additive information in a given food category depends on how they perceived that category or additive (Balasubramanian & Cole, 2002:116). The ELM thus provides useful insight into the role and importance of the information search for food additive label reading consumers who perceive food additives as risky.

4.4.3 Reception of food additive information

The reception of food claims and the content list information concerning food additives, such as flavourants, colourants and preservatives are the third step described in the ELM (Figure 4.1). *During the reception of additive claims such as "no preservatives" on food labels,* consumers' priorities can be exercised according to the need to be efficient when making a purchasing decision. Consumers may consider their allocation of disposable income or the avoidance of harmful products for consumption (Wright, 1997:421; Nancarrow *et al.*, 1998:112) such as food additives contained in a product before making a purchasing decision. In addition, consumers indicate that some additive information is unverifiable. For example, Wandel (1997:213) showed that many consumers explained that they did not know what the E-numbers that indicate the additives meant and that this was a matter of concern to them. Furthermore, several consumers regarded some of the additive information on labels as irrelevant. According to Sloan *et al.* (1986:524), the three main reasons for consumers to ignore additive information were that consumers:

- realise that some additives are necessary to maintain the quality and safety of products;
- may not understand the functions of additives; and
- are unconcerned about or unaware of the presence of additives in food products.

Once a consumer has acquired receipt of the needed stimuli or information about food additives they must process it (Assael, 1995:161).

4.4.4 Consumers' processing of food additive label information

The ELM (Figure 4.1) is concerned with how information or stimuli is processed (§ 3.3.2) (Davies & Wright, 1994:63) in low and high involvement circumstances (Assael, 1995:161). Information processing can be defined as a series of activities through which stimuli are perceived, transformed and stored (Feldman, 1996:684). It is the consumer's perception of the actual state that drives problem recognition (Cant *et al.*, 2006:193) and activates the decision-making process (Hawkins *et al.*, 2004:306). It is understood that consumers seek and use information as part of their rational for problem-solving and decision-making (Peter & Olson, 2008:167). Crawford and Baghurst (1990:232), Crowe *et al.* (1992:20) and Williams *et al.* (2004:36) found that most consumers claim to use labels to look for the presence of food additives when making purchasing decisions. These consumers perceive food additives as a prime food safety concern. In addition, perception is a key component of information processing (Assael, 1995:161) because consumers make decisions and take action to solve problems based on what they perceive (Schiffman & Kanuk, 2004:550; Hawkins *et al.*, 2004:306; Solomon, 2004:75). The ELM (Figure 4.1) identifies two cognitive processes through which food additive information presented on labels can persuade consumers, namely the central and peripheral routes to persuasion.

4.4.5 The central and peripheral route of persuasion

Depending on the person's level of involvement (Schiffman & Kanuk, 2004:235) and the personal relevance of this information, the receiver of the stimuli will follow one of two routes (Solomon, 2004:282) or cognitive processes (Peter & Olson, 2008:427) to persuasion. Under the conditions of high involvement (when the persuasive message is relevant or somehow interesting), the consumer takes the central route (§ 3.2.3.2) (Figure 4.1) to persuasion (Schiffman & Kanuk, 2004:265; Solomon, 2004:282; Peter & Olson, 2008:427). The central route is based on information processing whereby the advantages or benefits (such as the low kilojoule values of artificial sweeteners) and disadvantages (artificial sweeteners may cause cancer) of food additives and/or arguments in a message are extensively weighed against each other (Antonides & Van Raaij, 1998:207). For example on

hearing a radio message about tartrazine that causes hyperactivity in children, the consumer might think that the argument holds truth. This is called supportive arguments (Solomon, 2004:282; Peter & Olson, 2008:427). The consumer tells her/himself to stop giving products containing tartrazine to the child. Or, he/she might offer counter arguments, such as "This is not true, my child is only spoiled". If a person generates counter arguments (§ 4.4.7.1) in response to a message, it is less likely that the consumer will give in to the message, whereas the generation of further supporting arguments by the consumer increases the probability of compliance toward such information or stimuli (Shimp, 1997:157; Solomon, 2004:282; Peter & Olson, 2008:427). Counter arguing reduces persuasion by leading to unfavourable product beliefs and weaker intentions or no intention to buy the product (Shimp, 1997:156; Peter & Olson, 2008:427).

On the other hand, under conditions of low involvement, the peripheral (§ 3.2.3.2) route to behaviour change is taken instead, as shown in Figure 4.1 (Schiffman & Kanuk, 2004:235; Solomon, 2004:282). The peripheral route takes place via limited information processing. In this route the largest influence takes the form of simple 'cues' (such as "no MSG" claim) in the message or stimuli, for example, the number of arguments in the message, rather than the quality of the arguments (Antonides & Van Raaij, 1998:208; Hawkins *et al.*, 2004:400). Thus, the consumer is likely to use other cues in deciding on the suitability of the message. These cues might include the product's package, the attractiveness of the source, the context in which the message is presented and/or the number of arguments. Sources of information extraneous to the actual message content are called peripheral cues because they surround the actual message (Solomon, 2004:282). The implication here is that low-involvement products may be purchased chiefly because the marketer used a popular spokesperson in the advertisement (Solomon, 2004:282; Peter & Olson, 2008:428). The peripheral route is, therefore, taken when the consumer is not motivated to attend to and to comprehend the arguments presented (Shimp, 1997:160; Solomon, 2004:282; Peter & Olson, 2008:427). For example, the consumer is not concerned or interested about tartrazine information and thereby ignores a "no tartrazine" claim on the product label.

Once consumers are exposed to and/or search for food additive information the interpretation process of attention and comprehension (Figure 4.1) takes place to facilitate consumers'

decision-making (Peter & Olson, 2008:109) via either the central or peripheral route of persuasion. Persuasion refers to the change in beliefs and behavioural intentions caused by communication (Peter & Olson, 2008:438).

4.4.6 Attention and comprehension of the food additive information stimuli

Attention, as indicated in Figure 4.1, occurs when the stimulus activates one or more sensory receptor nerves and the resulting sensation goes to the brain for information processing (Hawkins *et al.,* 2004:295). Attention is focused on product related features and factual information, for example, the ingredient list or claims in order to be searched for food additives the consumer wants to avoid (Wright, 1997:417). Consumers who experience high involvement in decision-making tend to focus attention on stimuli relevant to their needs (Peter & Olson, 2008:173).

Independent of whether the central or peripheral route is followed, food additive information, goes directly into the short-term memory (Hawkins *et al.*, 2004:334) for the interpretation and integration process (Peter & Olson, 2008:104) during comprehension of information. The information processing activities that occur in the short-term memory are called elaborative activities (§ 3.2.3). Elaborative activities are the use of previous stored experiences, values, attitudes, beliefs and feelings to interpret and evaluate information in the short-term memory as well as to add relevant previously stored information from the long-term memory (Engel *et al.,* 1993:402; Nancarrow *et al.,* 1998:114; Hawkins *et al.,* 2004:334). The knowledge stored in the memory is a major determinant of comprehension (Engel *et al.*, 1993:407).

Foxall *et al.* (2002:83) argue that elaboration is the final stage in information processing, and refer to the creation within the memory of complex networks of ideas and feelings about products based upon the stimuli transmitted to consumers. Thus the interpretation of perceptions about food additives is based on elaborative activities (Hawkins *et al.,* 2004:334). The degree of elaboration during comprehension (Figure 4.1) determines the amount of knowledge or the number of meanings produced, as well as the complexity of the interconnections between these meanings (Peter & Olson, 2008:105). In addition consumers'

comprehension process varies in depth and elaboration, depending on their levels of prior knowledge and involvement (Peter & Olson 2008:115) regarding food additives.

4.4.7 Motivation, opportunity and ability to elaborate the food additive stimuli

Elaboration likelihood refers to the probability of information processing (Figure 4.1) which depends on the motivation, opportunity and ability (MOA) of a consumer to engage in such behaviour (Antonides & Van Raaij, 1998:208). Together these three factors of MOA determine each consumer's elaboration likelihood for a particular stimulus or message (Shimp, 1997:156). Elaboration likelihood represents the chance that a consumer will elaborate on the message by thinking about it and reacting to it and comparing it with his/her pre-existing thoughts and beliefs regarding that product category (Shimp, 1997:156) or food additive. When elaboration (§ 3.2.3) is high the central route to persuasion is followed, where only those stimuli elements (called arguments) relevant to forming a "reasoned" opinion are influential (Petty & Cacioppo, 1986:8; Engel *et al.*, 1993:466). Elaboration likelihood is high when the MOA factors are high (Shimp, 1997:156). Conversely, the peripheral route to persuasion occurs under low levels of elaboration as elements (called peripheral cues) that are irrelevant to developing a reasoned opinion become influential (Petty & Cacioppo, 1986:8; Engel *et al.*, 1993:466). The elaboration likelihood is low when MOA factors themselves are low (Shimp, 1997:156).

It should, therefore, be of prime importance for a consumer to understand food additives correctly in order to make purchasing decisions by using the information on the ingredient list of a label. Just as a person's motivational state during information processing can influence information attention, so too can it exert an effect on comprehension. Motivation can also influence the elaboration that occurs during comprehension. When a stimulus is relevant (are useful for need satisfaction), more elaborate processing should occur (Engel *et al.*, 1993:408). Consumers become motivated and able to elaborate the stimuli or the message (Figure 4.1) when the message content is perceived as relevant to their needs and when they have the ability to think about the message (Nancarrow *et al.*, 1998:111). For example, cognitive processing of food additive claims such as "no MSG added" can be influenced by the need to

avoid harmful products for consumption. Motivation and ability to elaborate vary from consumer to consumer and make an imperfect fit between indicators of purchase and sales (Petty & Cacioppo, 1986:99).

4.4.7.1 Motivation

As mentioned before (§ 4.4.7), an important condition in the ELM is the consumer's motivation (Figure 4.1) to process the stimuli (Antonides & Van Raaij, 1998:208). Generally speaking, consumers are more motivated to process stimuli the more involved they are in the subject matter of the stimuli (Shimp, 1997:156). Motivation, a personal factor, is the reason for behaviour (Antonides & Van Raaij 1998:210). A motive is why an individual does something (Hawkins *et al.*, 2004:355). Motives (§ 3.2.3) play a role in shaping our perceptions (Coon, 2006:204). Factors that influence motivation are summarised in Table 4.1.

Table 4.1 Motivation, opportunity and ability to process information (Antonides & Van Raaij, 1998:271)

MOA Model	General factors (Product independent)	Specific factors (Product dependant)
Motivation	Need for cognition	Personal relevance
	Opinion leadership	Involvement
Ability	Shelf-schema	Expertise
	Intelligence	Prior knowledge
	Procedural competence	
	Optimal level of stimulation	
Opportunity	Information supply	Level of stimulation
	Status-quo tendency	Information supply
		Framing
		Time pressure
		Distraction
		Medium, context

For example, if you are hungry, food related words are more likely to draw attention than non-food words (Mogg *et al.*, 1998:235). Thus if a consumer is concerned about MSG in his/her diet, then stimuli such as a "MSG free" claim are more likely to attract his/her attention. In addition to directing attention, motives may alter what is perceived (Coon, 2006:204). Highly involved consumers are usually more motivated to follow the central route (Figure 4.1), whereas consumers with a low involvement tend to choose the peripheral route (Figure 4.1) (Antonides & Van Raaij, 1998:208). Motivation includes the tendency and interest of consumers to process information (Antonides & Van Raaij, 1998:271).

4.4.7.2 Opportunity

A third condition is the opportunity (Figure 4.1) to process information (Antonides & Van Raaij, 1998:208). This condition is not explicitly distinguished in the ELM of Petty and Cacioppo (1986), but was added during later research (Antonides & Van Raaij, 1998:208). Opportunity involves the matter of whether it is physically possible for a consumer to process stimuli. Opportunity is restricted when stimuli are presented too quickly, when the sound is too low, or when an individual is distracted (Shimp, 1997:156). The opportunity to process information is also a factor which determines whether the central or peripheral routes are followed. Repetition of the message increases the chance of information processing, because there is a more frequent opportunity to think about the contents. However, too much repetition leads to over exposure and thus aversion and boredom (Antonides & Van Raaij, 1998:210).

Furthermore, external events such as noise and social interaction can distract the recipient of the stimuli from processing it. There is less opportunity for information processing when the consumers concerned are placed under time pressure (Antonides & Van Raaij, 1998:210) and decision-making quality also deteriorates (Park *et al.*, 1989:424). For example, when consumers are in a hurry when shopping and do not have time to read the label for the food additives which they want to avoid in that particular product. Opportunity refers to the circumstances to process information and thus is a situational factor (Antonides & Van Raaij, 1998:271).

As factors in the persuasion setting reduce the recipient's motivation or ability to think about an issue, there is a likelihood that the recipient will try to evaluate the merits of the recommendation by relating the incoming information to their prior knowledge about and experiences with the object (Petty & Cacioppo, 1986:13). The critical feature is that a persons' prior knowledge dealing specifically with the topic under consideration and the inferences one might draw from the externally provided message arguments are less likely to be considered in response to the persuasive appeal when elaboration is low (Petty & Cacioppo, 1986:16). The ELM recognises that consumers can scrutinise or elaborate upon feelings and behaviours as well as beliefs if they are perceived central to the merits of the attitude object under consideration. In short, just as peripheral cues can be based upon affective, cognitive or behavioural factors, a consumer's perceptions of the central merits of an attitude object can be based on these domains as well (Petty & Cacioppo, 1986:18). Consumers do not buy products. Instead they buy motive satisfaction or problem solutions (Hawkins *et al.*, 2004:369). For example, a consumer buys ice-cream with artificial sweeteners because it contains less kilojoules than sugar and thereby believes that the artificial sweetener can solve an overweight problem.

4.4.7.3 Ability

The second condition in the ELM is the ability (Figure 4.1) of the consumer to process the stimuli (Petty & Cacioppo, 1986:61; Antonides & Van Raaij, 1998:208; Grunert, 2002:281). Knowledge, intelligence, level of education and other factors as indicated in Table 4.1 play a role. Complicated stimuli require more knowledge and insight than simple stimuli (Antonides & Van Raaij, 1998:208). Ability concerns whether a person is familiar with stimuli claims and is capable of comprehending them (Shimp, 1997:156). Sufficient ability is required for information processing via the central route. Specific knowledge about the subject of the stimuli facilitates information processing via the central route (Antonides & Van Raaij, 1998:210). Ability is a personal factor and can be described as the degree to which consumers are competent to process the information (Antonides & Van Raaij, 1998:21). While consumers may be motivated to process additive information, many consumers will not have the ability to process the information of for instance E-numbers on a given product, because

they do not have the necessary knowledge to know what a particular E-number stands for (Abbott, 1997:45; Wandel, 1997:213).

4.4.7.4 Factors affecting the consumer's motivation to elaborate on additive stimuli

Factors affecting the motivation (Figure 4.1) of consumers to elaborate relatively objectively include personal relevance, personal responsibility, number of message sources and need for cognition (Petty & Cacioppo 1986:109; Assael, 1995:161). Experiments by Petty and Cacioppo (1986) all support the premises that, as personal relevance increases, so does the motivation to process issue-relevant arguments. In addition, the personal relevance of a stimulus depends on its perceived impact on the consumer's life (Petty & Cacioppo, 1986:88). For example, Worsley (1996:75) and Prättälä *et al.* (1985:242) found that the presence of children in the home was positively related to the perceived usefulness of information about additives. One important factor of the ELM is that it holds that it is possible for any one factor, such as message repetition, to have multiple effects on message elaboration (Cacioppo & Petty, 1979:98).

4.4.7.5 Factors influencing the consumer's ability to elaborate on additive stimuli

Nancarrow *et al.* (1998:112) argue that the importance of food labelling information is product specific and contingent on how it fits in with the prior knowledge and perceptions held by consumers. The authors further indicate that those consumers who consider product information to be of high relevance to them are more likely to generate counter arguments (§ 4.4.5.1) if the arguments presented are considered inconsistent with their original opinions. The consumer compares and contrasts the information in the communication with previous information (associations, images and experiences) in order to evaluate the new information (Nancarrow *et al.*, 1998:112). Therefore, it is vital that label designers pay attention to the prior perceptions and beliefs held by consumers. Effectiveness in labelling would help consumers to choose between different products on the market (Wright, 1997:417; Nancarrow *et al.*, 1998:112).

Prior knowledge enhances consumers' ability (Figure 4.1) to understand a message (Petty & Cacioppo, 1986:8). Unlike the experts, the novice may have difficulty understanding the terminology (for example, the E-numbers of additives) and the significance of the message claims on food products. Knowledge can help consumers recognise faulty logic and erroneous conclusions and avoid incorrect interpretations. Knowledgeable persons are more likely to elaborate on message claims, whereas unknowledgeable consumers may focus on non-claim cues (pictures or packaging) within the message (Engel *et al.*, 1993:407).

Although it is possible for prior knowledge to enable more objective information processing in some instances, because stored knowledge tends to be biased in favour of an initial opinion, more often than not this prior knowledge will enable biased scrutiny or externally provided communications (Petty & Cacioppo, 1986:112). Thus the more issue-relevant knowledge people have, the more they tend to be able to counter argue communications opposing their initial positions and to pro-argue congruent messages cognitively (Petty & Cacioppo, 1986:117). According to McIntosh *et al.* (1994:84), perceptions and beliefs are shaped by knowledge, which in turn is a product of exposure to information sources and personal effort in obtaining information.

Other factors affecting the ability to elaborate objectively are distraction, moderate message repetition, recipient's posture, message complexity, message modality, heart rate and recipient intelligence/education. Perceptions of argument strength are often quite subjective and idiosyncratic. The same argument may seem strong or weak depending upon the store of prior information available in the memory (Petty & Cacioppo, 1986:81).

4.4.8 Retention of food additive information

As consumers gain more knowledge about a subject, such as food additives, they expand their knowledge by relating new information to old information in order to make the information more meaningful (Hawkins *et al.*, 2004:229). Thus consumers retain (Figure 4.1) the message contents until an opportunity arises to act on them and to exhibit purchasing behaviour (Assael, 1995:739-740; Hoyer & MacInnis, 2001:197).

4.4.9 Consumers' purchasing intention

Integration process is where intentions (Figure 4.1) are formed (Peter & Olson, 2008:172) to purchase or not to purchase a food additive containing product. The willingness to change behaviour is determined by perceptions and beliefs (Wilcock *et al.*, 2004:58). In order to change, consumers have to perceive that their current behaviour endangers their health and that taking action has a strong likelihood of reducing their risks.

4.4.10 Purchasing behaviour

Purchasing behaviour (§ 3.5) is largely determined by how the consumer thinks and processes information (Foxall *et al.*, 2002:28). In a purchasing situation, consumers consider the benefits and risks of each choice alternative by integrating information about positive and negative consequences (Peter & Olson, 2008:74). The consumer has two alternatives: to buy or not to buy. Not to buy might also imply postponing the purchase. The consumer's response might further involve two activates: a verbal response and a behavioural response. In a verbal response the consumer commits him/herself to the purchase or gives reasons for deciding against purchasing. In a behavioural response the consumer pays for the merchandise or postpones the decision (Rousseau, 2003a:120). It is recognised that perceptions, however distorted from reality, can affect consumers' beliefs and drive purchasing behaviour (Engel *et al.*, 1993:435; Davies & Wright, 1994:58). Hawkins *et al.* (2004:27) explains that during the purchasing process, consumers select one product over another based on the value that they perceive will satisfy their needs. Consumers arrive at this acquisition decision through a series of steps. Each step is a mini-problem for the consumer to solve before proceeding to the next step (McNeill & Crotts, 2006:60). Thus, the last stage, for the purpose of this study, is the decision-making process is the consumer's response, which involves choosing the most desirable alternative, in other words, to buy or not to buy (Rousseau, 2003a:117).

4.5 SYNOPSIS

The ELM provides a useful approach to understanding how consumers evaluate messages received, such as the ingredient list containing additives used in products and the main processes underlying persuasion. This is a theory about how behaviour is formed and changed under varying conditions of involvement. The ELM consists of a sequence of stages in consumer behaviour ranging from exposure to stimuli, such as the food additive containing product, reception of food additive claims and food additives content of the ingredient list, stimuli processing though the central or peripheral route to persuasion, attention, comprehension and ultimately to belief, perception and behaviour change. The ELM explains how individual and situational differences among consumers determine when stimuli, information contents or promotional aspects of an advertisement or label content are more likely to influence consumer behaviour. Therefore, the ELM of persuasion is a model that can be used to investigate the way perceived information of food additives is processed. It is argued that additive labelling and the role it plays in consumers' decision-making process and consequent purchasing behaviour needs empirical investigation.

The next chapter presents details of the research methodology applied in the design of the empirical study regarding consumers' perceptions of food additives and consequent purchasing behaviour. The objectives of the study, ethical considerations, sampling strategy, data collection methods and an overview of focus groups procedures are discussed. Furthermore, an overview is given of the procedure followed to analyse the qualitative data and the steps taken to ensure trustworthiness of the study.

CHAPTER 5

STUDY DESIGN AND RESEARCH METHODOLOGY

5.1 INTRODUCTION

The aim of this chapter is to present details of the research methodology applied in the design of the study regarding consumers' perceptions of food additives and consequent purchasing behaviour. It, furthermore, provides insight and understanding of the basic qualitative research methodological technique of focus groups that was used during the study. This chapter focuses on the objectives of the study, empirical research design, ethical considerations, sampling strategy, data collection methods and a framework for focus group research. An overview of the procedures followed to analyse qualitative data collected through focus group discussions and the strategies to ensure trustworthiness thereof are also explained. The data collected are used to design a model of consumers' of food additive perceptions and consequent purchasing behaviour by applying the proposed theoretical model as discussed in Chapter 4.

5.2 THE IMPORTANCE OF CONSUMER RESEARCH

Consumer behaviour has grown into a fully-fledged research discipline where mainly four different groups utilise consumer research. These different groups are the marketing managers, consumers, public policy makers and regulators (Assael, 1995:33) as well as ethicists (Hoyer & MacInnis, 2001:18). From the perspective of marketing managers, the study of consumer behaviour is important in helping to forecast and understand consumer demand for products (Antonides & Van Raaij, 1998:1). Marketers, therefore, try to understand consumers and their behaviour better in order to achieve business success by applying this knowledge to various marketing strategies (Sheth *et al.*, 1999:11; Hanna & Wozniak, 2001:3; Schiffman & Kanuk, 2004:12). In the context of the present study food manufactures and advertisers could also apply these results and proposed model in the

technical design of more effective, understandable, user friendly food labels in terms of food additives and food additive claims.

In addition to the marketers' perspective, consumer behaviour can take on a very different perspective through the consumer's eyes. Assael (1995:25) indicates that consumers are interested in evaluating information in the light of their own needs and wants. Consumers view food product information as stimuli for making better choices, whereas managers' objectives are to present their products in the best light possible (Assael, 1995:26). Furthermore, it is important that consumers understand the strategies and tactics that marketers are using to influence them in order to make properly informed decisions about what they buy (Cant *et al.*, 2006:6). The study of consumer behaviour can improve consumers own lives as they can demand products to be more user-friendly (Hoyer & MacInnis, 2001:22) by utilising their resources in the best possible way.

Understanding consumers' perceptions of food additive information as provided on food labels is required in designing food labelling regulations and improving public health, thus reducing medical and other costs (Antonides & Van Raaij, 1998:17), while enhancing the profitability of the food industry. To improve the benefits of food labelling policies and the draft legislation of SA, the design, format and disclosure of food labels are important (Wang & Fletcher, 1995:373) to investigate. This study provides an understanding of South African consumers' issues and concerns about food additives which can be utilised in future food labelling regulations.

Furthermore, consumer organisations are united in their demands for more research into what information consumers need and want from food labels, with a level of detail on the label that best serves the need of consumers (FAC, 2002:40). This study is, therefore, important, because it sheds light on consumer's perception of food additive labeling. The information obtained from this study can be used by South African consumer organisations to protect the rights of consumers to be adequately informed.

5.3 OBJECTIVES OF THE STUDY

The one primary objective and six secondary objectives for this consumer study are provided in Chapter 1 (§ 1.3). The secondary objective of the literature study was discussed in Chapters 2 and 4. The present chapter will deal with the methodology to achieve the secondary objectives of the empirical study.

5.4 QUALITATIVE RESEARCH STRATEGY

As an exploratory study (Greeff, 2005:303), a qualitative methodology was used, since the aim was to gain depth and understanding of issues salient to the consumers in an under-researched area (Eisenhardt, 1989:542). Moreover, Van de Venter (1998:44) is of the opinion that it is necessary to emphasize the need to understand how consumers perceive food labels so that manufacturers do not waste time and energy on information that is irrelevant to consumers. This indicates the need for a phenomenological approach to be used, because the researcher has to understand the participants of the present study's perception as completely as possible. A phenomenological study is a study that attempts to understand people's perceptions, perspectives and understanding of a particular situation (Leedy, 1997:161; Delport & Fouché 2005:264). Moreover, Lichtman (2006:27) indicates that the purpose of phenomenology is to describe and understand the essence of individuals who have experienced a particular phenomenon (such as food additives in the present study).That means, in order to understand consumers, the researcher needs to look at the meaning of the social event through the eyes of the participants – to see it as they see it (Hayes 2000:188; Fouché, 2005:270). Thus consumers' subjective experiences were taken into account (Hayes, 2000:188).

The theory which is produced in this type of study is firmly grounded in the observation of reality and not in theory which was developed because it seemed to be logical, or because it mirrored someone's hypothesizing about the likely mechanisms involved (Hayes, 2000:188). Therefore, this type of study is based on the grounded theory. Mark (1996:214) explains that the grounded theory approach is concerned exclusively with the generation, rather that the

testing of theory. Phenomenological approach and grounded theory are two forms of qualitative research, in which theory emerges from the data and is not being imposed beforehand (Hayes, 2000:188).

Data is collected by means of focus groups with a relatively small number of participants (n=39) (Maykut & Morehouse, 1994:63) who have participated in a process about a central phenomenon (reading food additives labels in the present study) to "saturate" categories and detail a theory. The research needs to locate a homogeneous sample (§ 5.6) (Fouché, 2005:270). In light of the secondary objectives of this study, focus groups formed part of the study design in particular, in order to identify the causes for additive labels readers' perceptions and purchasing behaviour (Sternthal & Craig, 1982:17; Krueger, 1994:27). Analysis takes place through open coding (§ 5.8.1.2) (De Vos, 2005: 341; Fouché, 2005:270) in an attempt to deliver a theory or a theoretical model (Figure 7.1) as the product of the research (Chapter 7) (Delport & Fouché 2005:265).

Qualitative research is a scientific, reliable research method which can be used to investigate consumers' opinions and perceptions (Ratcliff, 2003) on food labels and was thus chosen as the research method in the present study and will subsequently be discussed in more detail.

5.5 ETHICAL CONSIDERATIONS

It is clear from the secondary objectives (§ 1.3) that this study carries little risk to participants. Ethics committees are particularly interested in protecting the right of potential participants (Kent, 2000:86; Babbie & Mouton, 2001:528) in research studies. This study was approved by the Ethics Committee of the North-West University (reference number 04k11) on August 30, 2004 (Annexure B). Furthermore, various aspects of ethics in the field were taken into consideration for this study. The first was to gain access to the research sites (Silverman, 2000:198; Sayre, 2001:42), which involved getting permission from the location gatekeeper. The researcher, therefore, obtained permission from the managers of the different supermarkets (Annexure C) and the selected preschools (Annexure D) which were used to select potential participants for the study. Secondly, it was important in the context of

research ethics to acquire informed consent (Annexure E) from the participants (Silverman, 2000:201; Carson *et al.*, 2002:174; Fine *et al.*, 2003:177; Yates, 2004:160; Lewis, 2005:66, 76; Lichtman, 2006:57). Thirdly, permission was obtained from the participants to record the discussion on tape.

Informed consent is needed to protect the important ethical principal of autonomy (Kent, 2000:85; Christians, 2003:217). Obtaining informed consent implies that all possible or adequate information on the objectives of the study, the procedures followed, the possible advantages, disadvantages and the credibility of the researcher are rendered to the participants (Williams *et al.*, 1995:30; Neuman, 2003:123; Henning *et al.*, 2004:73; Lewis, 2005:76). The researcher took the questions (Table 5.1) suggested by Kent (2000:85) into account for the design of the informed consent form (Annexure E) used in this study.

Table 5.1 Suggested format for an information sheet. Areas of possible concern to research participants (Kent, 2000: 85)

	Area of concern
1	What is the purpose of the study?
2	Who is conducting this study?
3	What will be involved if I take part in this study?
4	Where and when will the study take place?
5	What information will be collected?
6	Do I have to take part?
7	Can I withdraw at any time?
8	Will all information be kept confidential?

Apart from the suggested questions, other aspects pertaining to informed consent that the researcher took into consideration were that:

- nobody should ever be coerced into participating in a research project (Strydom, 2005b:59);
- participation must always be voluntary (Neuman, 2003:124; Thomas & Smith, 2003:21; Babbie, 2004:470);

- adequate information regarding the study must be given (Strydom, 2005b:59);
- enough time to ask questions must be provided (Strydom, 2005b:59);
- no form of deception should ever been inflicted on participants (Loewenberg & Dolgoff, 1988:70; Christians, 2003:217; Neuman, 2003:229; Strydom, 2005b:60);
- accuracy of data is a cardinal principle in social science codes. Fabrications, fraudulent materials, omissions and contrivances are both nonscientific and unethical (Christians, 2003:219);
- no violation of privacy, anonymity and confidentiality may take place (Judd *et al.*, 1991:505; Christians, 2003:218; Babbie, 2004:472; Lewis, 2005:67; Strydom, 2005b:61); and
- debriefing sessions after each focus group should be done in order to rectify any misperceptions about the topic that might have arisen in the minds of the participants (Judd *et al.*, 1991:501; Carson *et al.*, 2002:127; Babbie, 2004:475; Strydom, 2005b:66-67).

Furthermore, Strydom (2005b:60), like Loewenberg and Dolgoff (1988:71) strongly believe that informed consent remains necessary even if the participants do not listen or are not interested in the explanation thereof during the introduction to the research study.

5.6 SAMPLING STRATEGY

Besides the ethical considerations mentioned, the recruitment of the right participants is mostly an underestimated aspect in a qualitative study (Krueger, 1994:74) and convenience sampling (Honigmann, 1982:57; Morgan & Scannell, 1998:57; Patton, 2002:199; Ritchie *et al.*, 2005:81). Like most qualitative methods, focus groups rely mainly on purposive samples (Morgan & Scannell, 1998:56; Silverman, 2000:104; Carson *et al.*, 2002:117; Greeff, 2005:304). Convenience sampling, on the other hand, lacks any clear sampling strategy (Honigmann, 1982:57; Morgan & Scannell, 1998:57; Patton, 2002:199; Ritchie *et al.*, 2005:81). Babbie (2004:166), Burgess (1984:235) and Honigmann (1982:58) call it judgment sampling. Nevertheless, the sample units in purposive sampling are chosen because they have particular features or characteristics which will enable detailed exploration and understanding

of the central themes. These may be socio-demographic characteristics or may relate to specific experiences and behaviours (Ritchie *et al.*, 2005:78).

As mentioned before (§ 5.4) a homogeneous sample in terms of the inclusion and exclusion criteria was needed for the present study which was based on the grounded theory. In addition, Carson *et al.* (2002:117) argue that participants should be selected for their suitability and ability to provide insights that are relevant to the particular study. LeCompte and Preissle (1993:349) maintain that "criterion based" is a more appropriate term because all sampling is purposive. Members of a sample are, therefore, chosen with a purpose to represent a location or type in relation to a key criterion. In this study a purposive sampling strategy for choosing focus groups participants was applied, focusing on the project's objectives (§ 1.3.2) (Morgan & Scannell, 1998:56; Krueger & Casey, 2000:70). Furthermore, two approaches of purposive sampling, designed to yield different types of sample composition pertaining to the study were used. The first approach of homogeneous samples was chosen to give a detailed picture of a particular phenomenon (Carson *et al.*, 2002:118; Patton, 2002:201; Greeff, 2005:304; Ritchie *et al.*, 2005:79) thus for this study participants had to have all or shared food purchasing responsibilities in the household. The second approach of intensity sampling was chosen because intensity sampling strongly represents the phenomena of interest (Patton, 2002:201; Ritchie *et al.*, 2005:79) such as food additive label readers related to this study.

Moreover, a purposive sample generates the most productive discussions in the focus groups because the objective in focus group discussions is to gain insight and understanding by hearing the opinions of participants in depth (Morgan & Scannell, 1998:56). The most important aspect in the sampling strategy of focus groups is that a systematic (§ 5.9.1) procedure with well-defined selection criteria (§ 5.5.4) is used to select participants. Careful selection of participants in a systematic way can minimise bias (Morgan & Scannell, 1998:58) and thus elevate the trustworthiness of the research study. In other words, having the right participants in focus group discussions is important. Although the selection or recruitment of participants may be one of the routine steps in a focus group project, it is absolutely essential. Problems with recruitment are the single most common reason for the failure of focus group projects, therefore, solid recruitment planning is one of the smartest moves the researcher can

make (Morgan & Scannell, 1998:4). Specific tasks during the recruitment phase of participants as utilised in this study were the following:

- defining the target population;
- defining segments within the target population;
- developing eligibility and exclusion criteria for individual participants;
- developing recruitment screening and invitation scripts;
- making the initial recruitment contacts with potential participants; and
- determining follow up procedures that will ensure attendance (Morgan & Scannell, 1998:11; Greeff, 2005:304).

5.6.1 Defining the target population

The first stage of the sampling strategy involved identifying exactly who needed to be sampled. There are three key issues that need to be addressed in defining the target population (Ritchie *et al.*, 2005:87) for this study. This involves deciding which population will, by virtue of their proximity to the research question, be able to provide the richest and most relevant information. The researcher should also decide which subset of the population should be excluded (§ 5.6.4.1). Further, consideration should also be given to the inclusion of additional groups or subpopulations (§ 5.7.4.1), if appropriate (Ritchie *et al.*, 2005:87). During the second step of sample selecting, care must be taken to actually reach individual consumers (§ 5.6.1) who fit the purpose (Morgan & Scannell, 1998:58). Thus, for the purpose of this study the population comprised individuals, both male and female, 20 to 60 years old who were reading food ingredient and food additive labels. Participants were recruited in the Vanderbijlpark - Vereeniging area in the Gauteng province of SA.

5.6.2 Sampling procedure

A non-probability sampling technique, using purposive or judgmental sampling (Babbie & Mouton, 2001:166; Strydom & Delport, 2005:328) was applied. Babbie and Mouton (2001:166) explain that a purposive sample can be selected on the basis of one's knowledge of the population, its elements and the nature of the research objectives. This implies selecting

the sample based on the researcher's judgment and purpose of the study. As an exploratory study, with the aim to determine consumers' perceptions about food additives, the selection of the sample located at a single geographical area was seen as appropriate. The shopper screen method can be seen as an adoption of the household screen method suggested by Ritchie *et al.* (2005:91). Morgan and Scannell (1998:89) named this procedure of recruiting participants in shopping malls, intercepts. The researcher, therefore, developed a shopper screen or a screening questionnaire (Annexure F), because the participants were selected in shops and at the selected preschools. The shopper screen involved approaching the shopper reading food labels. Three stores belonging to three different national chains, but of similar size in the Vanderbijlpark - Vereeniging area were used. The researcher and trained fieldworkers conducted the short screening interview in the store in order to determine whether the shopper is a food additive label reader (§ 6.3.1.4) and met the selection criteria (§ 5.5.4). Because the sample population was a small one in terms of prevalence of consumers who were at risk of food additives in the population as a whole, as discussed in (§ 2.8), other sample approaches were also used.

Working through organisations which represent a particular population can be a useful way of generating a sample frame (Ritchie *et al.*, 2005:93). Ten randomly nursery schools in the Vanderbijlpark - Vereeniging area were approached to assist in locating people who met the selection criteria (§ 5.5.4) of the study. The researcher looked for consumers with children with food additive allergies, hypersensitivity to food additives and those with toxic reactions to food additives, who are food additive label readers. The next step was to decide which criteria would be used for the purposive selection of the sample.

5.6.3 Selection criteria and sample size

5.6.3.1 Selection criteria

Strydom and Delport (2005:329) argue that in purposive sampling a clear indication and formulation of selection criteria is of cardinal importance. Similarly, Morgan and Scannell

(1998:57) indicate the need for a well-defined selection or inclusion criteria for focus groups. The choice of selection criteria is influenced by a review of the secondary objectives of a study and the lines of enquiry being pursued (Ritchie *et al.*, 2005:97). Since the researcher only investigated the consumers' perceptions, meanings and opinions about food additives and food additive labelling, certain criteria pertinent to the study to establish the correct group composition were determined before the fieldwork was done. In order to determine the selection criteria, the researcher employed inclusion and exclusion criteria (§ 1.5.2) as suggested by Babbie and Mouton (2001:287).

5.6.3.2 Number of participants in focus groups

A review of the literature revealed that the number of participants to be included in a focus group varies considerably. Focus groups usually consist of six to ten participants (Morgan & Scannell, 1998:71; Oates, 2000:191; Greeff, 2005:305). According to Carson *et al.* (2002:119) and Krueger (1994:78), participant numbers range from six to 12, whilst Stewart and Shamdasani (1990:60), Hanna and Wozniak (2001:43), Neuman (2003:253) and Cant *et al.* (2006:142) indicated eight to 12. Finch and Lewis (2005:172) and Patton (2002:205) specified six to eight whilst Schiffman and Kanuk (2004:26) indicated eight to ten participants. Sayre (2001:139) mentioned that a group can range from nine to 13, Sheth and Mittal (2004:232) from six to 15 and Hawkins *et al.* (2004:304) from five to 15 participants. In spite of the fact that authors disagree on the precise number of participants in a group, certain criteria need to be taken into account when selecting the correct number of participants for each study.

Morgan (1988:42) considers the amount that each participant contributes to the group as a major factor in the decision about the group size. Morgan and Scannell (1998:71) further mentioned that deciding on the right number of participants' means striking a balance between having enough people to generate a discussion and not having too many that some feel crowded out. They also indicate that the researcher should take into consideration whether smaller or larger groups of participants are needed. In line with this, Patton (2002:244) argues that the sample size depends on what you want to know, the purpose of the

project, what will be useful, what will have credibility and what can be done with the available resources and time.

In spite of the fact that smaller groups of less than four participants can lose some of the qualities of being a group (Finch & Lewis, 2005:193), four to six participants are preferable when the participants have more thoughts to share about the topic or have intense experiences related to the topic (Greeff, 2005:305). Groups of four to five are often referred to as mini-group interviews (Finch & Lewis, 2005:193). Nevertheless, Carson *et al.* (2002:119) argue that internationally the trend is towards a lower number of participants in a focus group, presumably to allow greater group interaction.

The group size for the present study depended on a number of factors as indicated by Finch and Lewis, (2005:193) and was applied as follows:

- the amount that the group participants were likely to have to say on the topic i.e. for participants highly interested in a topic, such as food additive labels, a smaller group was selected;
- the complexity of the issue: for a more complex topic such as food additive labelling and terms, smaller groups were selected;
- the extent to which the researcher required breadth or depth of data: the smaller the groups the more in-depth the discussion were;
- the population group involved: accommodating people who felt more comfortable in smaller groups; and
- the structure and tasks involved in the session: smaller groups were used because the participants needed to complete the awareness scenarios and the vignette, while the focus group discussion also took place.

In addition to all the above-mentioned factors, it was important to over-recruit by 20% to cover for "no-shows" (§ 5.7.5) (Morgan, 1998:41; Babbie & Mouton, 2001:292; Greeff, 2005:305).

5.6.3.3 Number of focus groups

Apart from deciding on the group size, the number of focus groups to be held was another important consideration (Morgan & Scannell, 1998:78; Oates, 2000:191; Greeff, 2005:306; Lichtman, 2006:130). When groups become repetitive, a point of theoretical saturation is reached, and there is little to be gained by using more groups (Babbie & Mouton, 2001:288; Shank, 2006:31). Krueger (1994:51) as well as Carson *et al.* (2002:118) suggest, as a rule of thumb, four focus group discussions, with the most information resulting from the first two groups. The number of groups for this study depended on a number of issues as indicated by Greeff (2005:306) and supported by views from Morgan and Scannell (1998:78), Flick (2002:119) and Ritchie *et al.* (2005:84):

- the number of groups depended on the project's objectives (§ 1.3);
- exploratory research, for example, will require a larger number of groups; and
- the more diverse the responses, the more groups will be required. For the present study the responses were diverse because each participant had a unique experience with food additives, therefore, the number of groups was determined by data saturation.

In general, the objective was to have only as many groups as were required to provide a trustworthy answer to the research objectives (Greeff, 2005:306) during data collection.

Both the number of participants in each focus group, as well as the number of group discussions constitutes the sample size. As a general rule of thumb, a qualitative sample for a single case study, (such as food additive perceptions) is often fewer than 50 (Ritchie *et al.*, 2005:84). If the sample is too large it becomes difficult to manage the quality of data collection and analysis that can be achieved. On the other hand, it is also important that the sample should not be too small, as it can cause missing key issues within the particular population. Small scale sampling only works if good purposive sampling has taken place (Ritchie *et al.*, 2005:85) as was the case in this study (§ 5.6.3.2).

5.7 FRAMEWORK FOR FOCUS GROUP RESEARCH

Krueger and Casey (2000:24-25) and Krueger (1994:44-45) list the following factors that need to be taken into consideration when selecting focus groups as methodology as was done in the present study:

- focus groups should be used when the purpose is to uncover factors that influence opinions, perception, behaviour or motivations (for example, food additive perceptions, motivation to search for additive information and purchasing behaviour were determined);
- to search for a range of ideas or feelings that participants have about the topic (for example, question 1 (Annexure I);
- to uncover ideas to emerging from the group (for example, when a more talkative participant reveals experiences about food additives it will prompt other participants to talk more freely);
- if insights are needed in exploratory studies;
- if there is a communication or understanding gap between professional groups (scientifically, technical, business, legal) and consumers (for example, studies indicated that consumers do not know what E-numbers meant (§ 2.14.6 & 4.4.3); and
- focus groups can provide insight in complicated topics, such as food additives.

Furthermore, focus groups were selected for this study because of the following advantages as pointed out by Krueger (1994:47), Stewart and Shamdasani (1990:111), Oates (2000:194) and Yates (2004:171):

- it has high face validity;
- the researcher obtains rich data in participants' own words;
- the researcher interacts directly with the participants;
- the participants react and build on the responses of other group members;
- it has speedy results; and
- it is low in cost.

On the other hand, the disadvantages of focus groups are that:

- the data are difficult to analyse;
- the researcher as interviewer or moderator (Yates, 2004:171; Punch, 2005:171) may influence the responses of the participants;
- results may be biased by a particular dominant group member;
- the moderators require special skills; and
- the groups are difficult to assemble (Krueger, 1994:47; Stewart & Shamdasani, 1990:111; Oates, 2000:194).

Focus group research methodology can benefit from a rigorous framework and prior planning. Conducting a focus group study consists of four phases namely, planning, recruiting, conducting the interviews or moderating, and analysing and reporting the results (Krueger, 1994:39; Morgan & Scannell, 1998:4). Keown (1983:60), Stewart and Shamdasani (1990:63) and Carson *et al.* (2002:122) refined the four phases into a framework for focus group research as shown in Table 5.2. The researcher applied the four steps of Krueger (1994:39) as well as the framework of Steward and Shamdasani (1990:63) during the empirical study. The order of the steps that the researcher followed differs slightly from those in Table 5.2, because it was for instance not practical to test the question guide (piloting) at such a late stage. The paragraph column indicates where each corresponding step is discussed in this chapter.

The terms focus group, group discussions or group depth interviews are often used interchangeably (Oates, 2000:187). In contrast to authors such as Krueger (1994:7), Krueger (1998:12), Carson *et al.* (2002:114), Flick (2002:112), Oates (2000:193), Finch and Lewis (2005:179) and Patton (2002:335) underlines the fact that the focus group interview is not a discussion nor a problem-solving session or a decision-making group, but indeed an interview. Nevertheless focus groups are a qualitative method (McDaniel & Gates, 2006:111) which give importance to each individual's voice, encouraging dialogue in the group and providing an opportunity to listen to individual concerns (Saumure, 2001:12). As a result of the particular selection methods utilised for focus groups, they do not aim to obtain data on representativeness of a particular position (Lewis & Ritchie, 2005:264). The focus group is a special type of group in terms of its purpose, size, composition and procedures followed (Krueger, 1994:6).

Table 5.2 Framework for focus group research (Based on Stewart and Shamdasani (1990:6), Keown (1983:60) and Carson *et al.* (2002:122))

Steps	Procedure followed	Corresponding paragraph
1	Define the problem/issue/topic/objectives	1.3 & 5.3
2	Establish the groups and plan of sessions	5.6.1, 5.6.2 & 5.6.3.1
2.1	Determine the number of groups	5.6.6.3
2.2	Determine the numbers of participants in each group	5.6.3.2
2.3	Decide on the length of a session	5.9.3
2.4	Select a site	5.9.3, 5.9.5.2 & Table 5.3
2.5	Decide on the timing of the sessions	5.9.3 & Table 5.3
2.6	Recruit the participants	5.9.1
3	Select the moderator and assistant moderator	5.9.5.3
4	Conduct or moderate focus groups	5.9.5
4.1	Determine the level of moderator involvement	5.9.5.3
4.2	Decide on the number of topics in a session	5.9.4 & 5.9.5.1
4.3	Identify questions/topics for discussion	5.9 & 5.9.5.1
4.4	Pre-test moderator's guide	5.8
4.5	Run or moderate the sessions	Table 5.3 & 5.9.5.2-5.9.5.5
5	Analyse the information or data	5.10

As mentioned before, participants are selected because they have certain characteristics in common that relate to the topic of the focus groups (Greeff, 2005:303). In addition, the focus groups are repeated several times with different participants. It is the responsibility of the moderator and assistant moderator to create an environment that nurtures different perceptions and points of view, without pressuring participants (Krueger, 1994:6). Furthermore, data are generated by interaction between group participants (Greeff, 2005:310; Finch & Lewis, 2005:170). Participants listen and reflect on what is said and in light of this, consider their own standpoint further. Participants ask questions to each other, seek clarification, comment on what they have heard and prompt others to reveal more

information. Another feature of focus groups is the spontaneity that arises from their strong social context. In responding to each other, participants reveal more of their own frame of reference on the subject of study (Finch & Lewis, 2005:170).

5.8 THE PILOT STUDY

According to Greeff (2005:309), pilot testing of focus group questions is difficult. However, Arthur and Nazroo (2005:135) argue that it is a critical part of research. In addition, Strydom (2005a:205) indicated that the pilot study is a prerequisite for the successful execution and completion of a research study. Greeff (2005:309) explains that the true pilot test is with the first focus group with the participants in the selected environment. Morgan and Scannell (1998:58) and Carson *et al.* (2002:125) suggest pilot testing with research team members, experts and potential participants. In addition, they recommend reviewing the entire focus group plan as a pilot test.

Before the main study, the researcher executed a pilot study (Annexure J) reviewing the entire focus group plan. The objective was to determine the sequence in which the focus group questions needed to be asked, general household procedure that needed to be in place, the time needed to complete the procedure, suitability of the venue used, testing of equipment to record information and training of the assistant moderators. During the pilot study, the awareness scenarios, the vignette and the focus group discussion were done in order to determine the suitability, testing and adoption, as well as data analysis of the procedures followed. The pilot study was conducted on the 1 June 2005. Five participants, all staff members of the Vaal University of Technology interested in food additive labelling, took part in the pilot study. The data collected during the pilot study were not included in the data analysis of the main study because some of the focus group questions and scenarios were changed for the main study.

5.9 DATA COLLECTION PROCEDURES OF THE MAIN STUDY

The in-depth group interview method of focus groups was employed (Rousseau, 2003b:28). Focus group discussions were held to obtain relevant data to evaluate the proposed model of consumer perceptions of food additives and consequent purchasing behaviour as discussed in Chapter 2. Focus groups are used especially in marketing (Schiffman & Kanuk, 2004:40; Finch & Lewis, 2005:170) and media research (Flick, 2002:118). Furthermore, it is a method that can be used on its own or in combination with other research methods such as surveys, observations and single interviews. In this study the focus group discussions were used in conjunction with unprompted (Annexure G) and prompted (Annexure H) awareness scenarios and a vignette.

The data was collected by means of the following procedures:

- firstly, the participants completed a food additive unprompted awareness questionnaire (Annexure G);
- secondly, the participants were given a vignette, with the purpose of determining prompted awareness (Annexure H); and
- thirdly, after completion of the awareness scenarios, the focus group discussions were conducted with the food additive label reading participants (Annexure I).

All the procedures were followed in the sequence as explained, during a one hour session.

5.9.1 Recruitment procedure

As mentioned before, recruitment is a systematic (§ 5.6) process. First, the researcher had to have access (§ 5.9.1.1) to the participants (Oates, 2000:189; Silverman, 2000:198). Secondly, the participants had to be screened (§ 5.9.1.2) according to the established selection criteria. Thirdly, the participants were reminded to attend the focus group sessions by means of a phone call a week and a day before the discussion session.

5.9.1.1 Access to participants

As mentioned earlier, the researcher obtained permission to access the participants in-store from the managers of the different supermarkets (Annexure C). The researcher interviewed the headmasters of the selected preschools asking permission to distribute information letters (Annexure D) to parents who are reading food additive labels and who might be interested in participating in the present study (Silverman, 2000:198; Yates, 2004:160).

5.9.1.2 Screening procedure

The researcher and fieldworkers observed consumers reading food labels in the identified supermarkets. The study was introduced to them and the researcher or fieldworker determined their keenness and willingness to participate by using a screening (Carson *et al.*, 2002:118; Ritchie *et al.*, 2005:105) questionnaire (Annexure F). The shoppers were approached during peak shopping hours because label reading consumers are limited in numbers. The most common reason for refusing to take part in the study was being in a hurry. Prättälä *et al.* (1985:239) experienced similar problems in selecting participants for their study. Another purpose of the screening questionnaire was to select a relatively homogeneous group (Patton, 2002:225; Robson, 2002:73; Ritchie *et al.*, 2005:79) of participants according to the established selection criteria (§ 5.5.4). Furthermore, the addresses and telephone numbers of participants were collected in order to call before the group discussion to confirm their intention to take part in the study (§ 5.9.2).

The researcher also indicated to the participants the incentives that they would receive for participating in this study. The participants were invited to attend one of two different focus group discussions, depending on which suited them best in terms of place and time (Table 5.3). After the first two focus group sessions the researcher recruited more participants for the next two focus groups sessions. The process of recruitment was continued until data saturation was reached with focus group eight.

5.9.2 Strategies to enhance attendance

The researcher implemented a final procedure to enhance participant attendance. The researcher used the traditional three-step strategy to ensure that selected participants show up for the discussion which includes the following:

- two weeks before the actual group the researcher and assistant moderators made contact with the participants by means of the screening questionnaire.
- one week before, all the participants received a confirmation telephone call; and
- one day before a follow-up phone call was made to all participants (Morgan & Scannell, 1998:86; Greeff, 2005:295).

Table 5.3 Summary of recruitment dates, focus group sessions, dates and venues

Focus group	Date	Size	Venue
Pilot study	01/06/05	5	Vaal University of Technology, Board Room Hospitality and Tourism Department, Vanderbijlpark
Group 1	27/06/05	3	Coffee Shoppe Conference Room, Vereeniging
Group 2	28/06/05	2	Coffee Shoppe Conference Room, Vereeniging
Group 3	09/07/05	3	Coffee Shoppe Conference Room, Vereeniging
Group 4	21/07/05	11	Private home, Vereeniging
Group 5	29/07/05	8	Mikes Kitchen Conference Room, Vanderbijlpark
Group 6	01/08/05	5	Private home, Vanderbijlpark
Group 7	02/08/05	3	Mikes Kitchen Conference Room, Vanderbijlpark
Group 8	12/08/05	4	Private home, Vanderbijlpark
Total participants		Pilot (n=5) Main (n=39) Total (n=44)	

Although Morgan and Scannell (1998:105) argue that a high no-show rate occurs because researchers fail to maintain enough contact with the participants. The no-show rate (§ 5.5.4.2) was applicable to this study although the researcher applied the three step strategy. Some groups were very small and may be due to the fact that it was during the school holidays. The researcher decided to continue with the smaller groups because the participants made an effort to attend. Morgan and Scannell (1998:103) argue that smaller groups of two to four participants can yield valuable information. After the school holiday in July, the number of participants participating in the study improved.

5.9.3 Dates and facilities for data collection

On the day of the focus group discussion the participants' voluntary cooperation was elicited and the general purpose of the study was explained to them. On arrival all participants read or listened to an explanation of the informed consent form (Annexure E). Thereafter, every participant completed and signed the consent form. All informed consent forms were filed in the corresponding focus group file, in case any concerns about the study should arise. The procedures were followed in the sequence (§ 5.7.3) explained, during a one hour session. This procedure was continued until saturation (Babbie & Mouton, 2001:288; Shank, 2006:31) of the data was reached. The focus group research was executed during June, July and August 2005 (Table 5.3). This procedure was continued until saturation of data from the focus groups discussions was reached which happened after the fifth group. Three additional focus groups discussions were held to confirm the findings and because some groups were particularly small. The focus group sizes ranged from two to 11 participants. In total 39 participants (n=39) were interviewed during the main study.

5.9.4 Scenarios and vignette

During the focus group discussions the participants completed a food additive awareness scenario presented in written format. With this measure the researcher intended to address part of the first empirical objective, namely to determine consumers' awareness of food additives, additive terminology and additive claims on general food items. First, an

unprompted awareness (Annexure G) questionnaire was used to determine the participants' ability to recall food additives. This method further provided an indication of which food additives are more on "top of mind" than others and is to some extent a memory test (FSANZ, 2003:8). At this stage no food additive information had been shown or revealed to the participants, thereby determining consumers' unprompted awareness. Secondly, the participants completed a vignette (Annexure H) with the purpose to determine prompted awareness. Prompted awareness is a more realistic and accurate measure of knowledge and it is a more accurate measure of recognition (FSANZ, 2003:8). Participants were asked to read a scenario, select the best suitable product and to give reasons for the selection of the product. Vignettes are short descriptions of a particular circumstance, which might be described by the researcher in a written version (Arthur & Nazroo, 2005:129). Furthermore, the above-mentioned vignette gave a common basis (Oates, 2000:192; Arthur & Nazroo, 2005:129) for the third part of the empirical study, namely the focus group discussions.

5.9.5 Focus group discussions

After completion of the vignette, the focus group was conducted with the food additive label reading participants. The purpose of this procedure was to determine the participants perceptions (Krueger, 1994:19) of the different sources of additive information, the application of food additive claims, the role that the food industry and regulators play with regard to food additives, safety, risks and quality issues with regard to food additives, as well as the reasons for utilising additive information. Krueger (1998:30) supported by views from Nyamathi and Shuler (1990:1282) and Greeff (2005:303) agues that focus groups provide insights into the perceptions and opinions of participants. According to McDaniel and Gates (2006:111), the intent of focus groups is to find out how participants feel about a product, concept or idea and how it fits into their lives, as well as their emotional involvement with the product, concept or idea.

Kajanne and Pirttilä-Backman (1996:211) and Wandel (1997:212) indicate that the interview method was proven to work well in investigating general thinking patterns perceptions and contents related to a less palpable theme, such as food additives and food labelling. The interview method was also used by the FSANZ (2003:5) for investigating food labelling

issues. On the other hand, Prättälä *et al.* (1985:239) argue that the focus group method is most suitable in the sense that shoppers speak rather freely about their food additive opinions. The focus group method also gives the researcher an opportunity to clarify unclear answers by asking new questions or to probe the participants for more information (Yates, 2004:167). Furthermore, it would be very difficult or impossible to study consumers utilising food additive labels in a real purchase situation by other methods. For example, observing consumers reading food additive information on a food label in the shop will be impossible because it would be impossible to determine what label information they read and what their perceptions about food additives are without asking them. The focus group method was, therefore, of prime importance for this study because the primary objective of the project was to explore participants' perceptions about food additives.

5.9.5.1 Development of focus group question guides

The focus groups for this study were guided by an interview schedule applying the funneling approach (Carson *et al.*, 2002:125; Greeff, 2005:297). Questions (Annexure I) were, therefore, asked from more general questions to more specific questions such as:

- general question: What is your general idea about food additives?
- specific question: How do food additive claims influence your purchasing decision?

Carson *et al.* (2002:123) argue that there is little consensus as to what constitutes a structured or unstructured group interview. Lederman (1990:119) indicated that five broad topics can be considered structured whilst Byers and Wilcox (1991:65) claim that 17 questions are relatively unstructured. A general guideline is that there should be fewer than 12 topics (Steward & Shamdasani, 1990:62). The researcher designed 15 questions (Annexure I) in order to cover most of the broad themes found in the literature and objectives of the study. In order to facilitate the comparison of comments across focus groups, a common set of discussion questions was used, but it also allowed minor variations to accommodate unique member characteristics as suggested by Balasubramanian and Cole (2002:121).

The researcher carefully investigated the available literature on food additive labelling and food additive concerns before developing the focus group questions. The types of focus group

questions as described by Krueger (1994:53-73), Krueger (1998:21-31), Stewart and Shamdasani (1990:64); Krueger and Casey (2000:56-65), Sayre (2001:236-237), Carson *et al.* (2002:123), Finch and Lewis (2005:177-179) and Greeff (2005:307-309) were considered in order to develop the focus group discussion guide for the study (Annexure I).

- Opening question

  Everyone answers this question at the beginning of the focus group. It is designed to be answered rather quickly and to identify characteristics that participants have in common. It is a factual question.
- Introductory questions

  These questions introduce the general topic of discussion and/or provide the participants an opportunity to connect with the overall topic. It is used to foster conversation and interaction among the participants.
- Transition questions

  These questions serve as a logic link between introductory and key questions.
- Key questions

  These questions (two to five questions) drive the study and these questions are the most important during analysis.
- Ending question

  These questions bring closure to the discussion and allow participants to reflect on previous comments, and are critical in analysis (Krueger, 1994:53-73; Krueger, 1998:21-31; Stewart & Shamdasani, 1990:64; Krueger & Casey, 2000:56-65; Sayre, 2001:236-237; Carson *et al.,* 2002:123; Finch & Lewis, 2005:177-179; Greeff, 2005:307-309).

The questions presented to participants were asked to provoke a discussion about food additive labelling, concerns about food additives, information about food additives and food additive claims. After the development of the question guide the researcher followed two strategies to test the effectiveness thereof. First, the question guide was reviewed by experts in the field of food additives and consumer behaviour and secondly, it was pilot tested with a carefully selected group of participants.

5.9.5.2 Setting for data gathering

The focus group sessions took place at a central location that had facilities for tape recording the interviews which in turn assisted in the analysis of the data. The physical arrangement of the room needed to facilitate the discussion (Oates, 2000:192; Finch & Lewis 2005:195). The participants were seated around a table to allow interaction, eye contact and a free flow of discussion. The phenomenological nature of the study on food additive labelling required a location and setting where participants would feel at ease (Greeff, 2002:300). Such an atmosphere ensured that the participants shared detail about their behaviour. Beverages such as tea, coffee and fruit juice were served before the discussion started. Afterwards the participants received refreshments and a small gift to thank them for participating in the project.

5.9.5.3 Moderating focus groups

The researcher took on the role of moderator and two colleagues were the first and second assistant moderators respectively. The moderator was familiar with the topic of discussion, as recommended by Carson *et al.* (2002:121). The second assistant moderator was responsible for the housekeeping duties such as refreshments, control of audio equipment and taking field notes. The moderator attempted to develop three clear focus group stages as suggested by (Krueger, 1998) during the one hour interview:

Stages in moderating a focus group

- Stage one: Scene setting and ground rules
  As participants arrived the moderator thanked them for coming, welcomed them and tried to put them at ease, avoiding the research topic. When the group was complete the moderator made a more formal start to the session, with a personal introduction, outline of the topic and background information on the purpose of the study. In addition, members in each group were introduced to each other prior to the discussion to create an informal and relaxed atmosphere, seen to be important in the conducting of focus group interviews (Crimp & Wright, 1995:95). As mentioned before, the

informed consent form was read and explained to the participants. Each focus group meeting included the moderator (researcher) (Oates, 2000:191), who was the same person throughout the study to keep the discussion along the lines of the research topic guidelines (questions). Participants were advised that there were no right or wrong answers to the questions and to express their honest thoughts, opinions and beliefs. It was done in an unobtrusive manner without hampering the flow of the discussion and debate between group members. To facilitate the comparison of comments across focus groups, the moderator used a carefully prepared discussion guide (Annexure I) for each group, but allowed minor variations to accommodate unique member characteristics. Particular care was taken to pose the questions as a natural part of the conversation. Attention was also paid to the participants' own initiatives during the course of the conversation. They gave a rich picture about the consumer's apprehension of food and health issues in general and their perceptions, knowledge and interest with regard to food additive labels. The field notes were taken by the assistant moderator. All the focus group discussions were audio tape-recorded by the second assistant moderator in order to facilitate data analysis (Oates, 2000:193).

- Stage two: Individual introduction

  The assistant moderator switched on the tape recorder and the participants introduced themselves by stating their name and indicating their favourite food (Krueger, 1998:22).

- Stage three: Opening the topic

  After the individual introduction, the moderator started with the general discussion by introducing the opening topic. The aim was to promote discussion and to engage as many participants as possible. It is beneficial to get everyone to say something at this early stage, as it can be difficult to break an individuals' silence as the discussion progresses (Krueger, 1998:23).

- Stage four: Discussion

  The moderator keeps a mental note of what is being said and will probe both the group as whole and individual participants, using open-ended questions (Yates, 2004:167). It

can be necessary for the moderator to direct the flow over other relevant topic areas, if they are not raised spontaneously by the group. Furthermore, the moderator had to follow one rule: Do not consciously try to affect the content of the answers given by the participants (Krueger, 1998:25).

- Stage five: Ending the discussion
  The moderator mentioned the final topic, or anything else to say before finishing, or anything left out. Thereafter the assistant moderator attempted to summarise the group's responses in order to determine the extent of agreement. Finally the moderator thanked the group, stressing how helpful the discussion had been (Krueger, 1998:26).

5.9.5.4 Debriefing of participants

A debriefing session for the participants, as suggested by Judd *et al.* (1991:501), Carson *et al.* (2002:127), Babbie (2004:475) and Strydom (2005b:67) where more information is given about the research was done. It also allows for further clarification of points and issues. At this stage a summary of the assistant moderators' perceptions about the proceedings were disseminated in order to ensure that they reflect the participants' perceptions. This procedure was done in order to increase the credibility of the data through a member check (Maykut & Morehouse, 1994:147). The researcher rectified any misinterpretations that have arisen in the minds of the participants (Strydom, 2005b:67). This was also the time used to explain questions about food additives that the participants asked during the discussions.

5.9.5.5 Debriefing of focus group sessions

Immediately after each focus group discussion the researcher and assistant moderators met to review and complete the notes taken during the discussion. The notes were made on the discussion content, group dynamics and discussion development (Babbie & Mouton, 2001:277; Finch & Lewis, 2005:175). These preliminary reflections helped to frame the concepts and categories used during the first stages of data analysis. It also helped to determine the stage where data saturation was reached. The field notes were also compared to

the tape recordings at this stage to ensure that the data could be trusted (Babbie & Mouton, 2001:277; Hawkins *et al.*, 2004:747; Schiffman & Kanuk, 2004:30; Finch & Lewis, 2005:175). All discussions groups were recorded and fully transcribed by the moderator and first assistant moderator. The entire interview was then written down by the first assistant moderator for all eight focus groups as a backup for the tape recorded information. These sets of raw data were then analysed by means of qualitative content analysis.

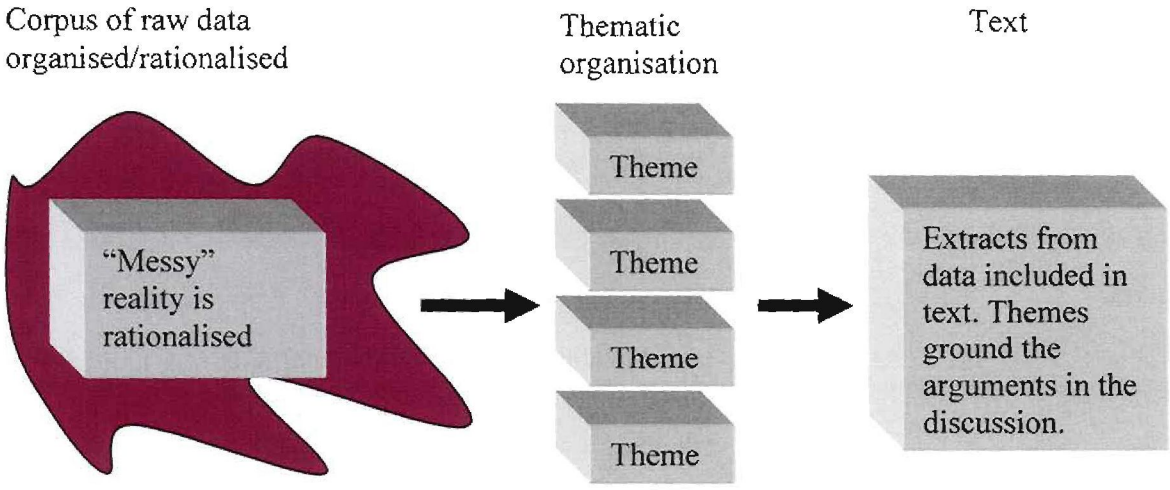
5.10 DATA ANALYSIS

The qualitative nature of the study produced a large amount of raw data, which needed to be analysed in such a manner that the rich and descriptive value would be preserved. Qualitative data are usually voluminous, disorganised, unwieldy and discursive (De Vos, 2005:333; Spencer *et al.,* 2005:202). The data may take on the form of extensive field notes and hundreds of pages of transcripts from focus groups. Data reduction is a central task in qualitative analysis, and can be achieved in a number of different ways. It may involve paring down statements to thematic summaries or précis of content (Spencer *et al.,* 2005:202). Moreover, analysis requires a mix of creativity and systematic searching, a blend of inspiration and diligent detection (Spencer *et al.*, 2005:199).

The procedure followed during the data analysis was the identification of key themes, concepts or categories (§ 5.8.1.3 & 5.8.1.4). To enhance rigour, the analysis followed the procedures typically used in grounded theory (Strauss & Corbin, 1990:62), whereby the researcher builds theory from the concepts emerging from the data by means of qualitative content analysis. Some concepts were chosen by the researcher and included common sense terms, terms influenced by the literature, or concepts devised by the researcher to capture the essence of talk and interaction. In short, the transcripts were analysed by means of qualitative content analysis where sub-concepts and concepts were identified and categorised and lastly, themes were formulated (Maykut & Morehouse, 1994:134; Hayes, 2000:125; Carson *et al.*, 2002:128; Henning *et al.,* 2004:131, 138; Yates, 2004:204; De Vos, 2005:248; Punch, 2005:205). Thus, qualitative content analysis of focus group discussions identified subtle underlying themes. This process yields valuable information about the nature of consumers'

concerns, motivations, perceptions (Tansey & Worsley, 1995:185), while Krueger (1994) adds aspects such as consumer's knowledge and perceived risk.

Holiday (2001:100) further explains that a "corpus" of "raw data" is systemised or rationalised and that it takes "messy reality" or everyday life into the domain of inquiring, moving it one step away from reality as lived (Figure 5.1). This corpus is then further "removed form reality" by "thematic organisation" into codes and categories as well as extracting and constructing themes from the categories. Lastly the thematic extractions are "even further removed from reality" by being written as text in a data chapter of a dissertation (Figure 5.1).



Movement away from reality to recontextualisation in research text

Figure 5.1 From data to text (Holiday, 2001:100; Henning *et al.*, 2004: 109)

When the researcher was satisfied that the themes represented a reasonable "researched chunk of reality", each theme was used as the basis for an argument in a discussion around the theme (Henning *et al.*, 2004:107) and supported by existing literature. Henning *et al.* (2004:110) further argue that processed data do not have the status of findings until the themes have been discussed and argued to make a point that is to be made from the research questions.

Grounded theory involves the generation of analytical categories and their dimensions, and the identification of relationships between them (Strauss & Corbin, 1998:303; Sayre, 2001:95; Punch, 2005:205). Approaches to analyse qualitative data according to the grounded theory vary and can include qualitative content analysis (Babbie & Mouton, 2001:490; Carson *et al.*, 2002:127). During qualitative content analysis both the content and context of documents are analysed. The grounded theory aims to develop and introduce more abstract and theoretical, albeit emergent concepts at very early stages of analysis (Strauss & Corbin, 1998:302). Coding is the process of transforming raw data into a standardised form (Stewart & Shamdasani, 1990:65; Babbie, 2001:309; Yates, 2004:204; Punch, 2005:199; Lichtman, 2006:164). Qualitative content analysis is essentially a coding operation. Here themes are identified, with the researcher focusing on the way the theme is treated or presented and the frequency of its occurrence (Robson, 2002:83). The process of data collection and conceptualisation continues until the categories and relationships are "saturated", that is new data do not add to the developing theory (Carson *et al.*, 2002:155). Theory building through approaches such as the grounded theory utilise specific analytic approaches (Strauss & Corbin, 1998:303).

Furthermore, Krueger (1994:157) recommends the following steps for analysing qualitative data:

- make back-up copies of tapes;
- transcribe the tapes for entry on the computer;
- moderator and assistant listen to the tapes, add names of the speakers and complete missing data if possible;
- file tapes, transcripts, field notes for future analysis;
- complete analysis by gathering the transcripts and field notes by categories of focus groups;
- read the transcripts and field notes one category at a time;
- look for emerging themes by question;
- develop coding categories and code the data;
- sort the data into coded categories;
- construct topologies or diagram of the analysis;

- see what data are left out and consider revision; and
- prepare the draft report, begin with the most important questions.

During the next sections, the data analysis procedures listed in the present study are discussed.

5.10.1 Qualitative content analysis

As mentioned before, a common procedure in the analysis of qualitative data is the identification of key themes, concepts or categories. To enhance rigour, the analysis follows the procedures typically used in grounded theory (Strauss & Corbin, 1990:62) whereby the researcher builds theory from the concepts emerging from the data by means of qualitative content analysis. Qualitative content analysis is mainly concerned with capturing and interpreting common sense, substantive meanings in the data (Spencer *et al.*, 2005:202). Content analysis is used to describe strategies used by participants in focus groups research (Carson *et al.*, 2002:151). Some concepts are chosen by the researcher and may include common sense terms, terms influenced by the literature, or concepts devised by the researcher to capture the essence of talk and interaction. In short, the transcripts were analysed by means of qualitative content analysis where concepts were identified and themes formulated from the concepts as described by Carson *et al.* (2002:128). Qualitative researchers use some form of content analysis to analyse the data, meaning that the researcher codes groups of words from the transcripts into categories (Silverman, 2000:128, 130; Richards, 2005:85). The categories are usually determined by the research topic.

5.10.1.1 Transcription of data

The first step of data analysis involves the transcription of data. This means that the tape recordings and field notes of the focus groups were typed into word processing documents. To assist in accomplishing this all data recordings were transcribed verbatim, in such a manner as to keep the transcriptions true to the phenomenological nature (Hayes, 2000:188; Silverman, 2000: 148). Notes made during the focus group sessions and the transcripts were analysed by the researcher. Therefore, the typed script then became the data used to analyse

the results (Hayes, 2000:174). Furthermore, the transcribed focus group discussions allowed the researcher to refer to them repeatedly (Hayes, 2000:174; Richards, 2005:86) in order to become familiar with the contents. Familiarisation is the immersion in the raw data by listening to the tapes, reading the transcripts and studying contemporaneous notes in order to list key ideas and recurrent themes (Richards, 2005:86). This facilitates peer review, since colleagues can only refer to the transcriptions to identify themes. Transcriptions of data of the present study were analysed manually. According to Henning *et al.* (2004:127), data can be analysed by qualitative computer software programmes (such as Atlas.ti).

5.10.1.2 Coding of the data

Coding was the second and essential (Yates, 2004:204) step in data analysis (Maykut & Morehouse, 1994:134). Open coding is only one part of doing grounded theory (Strauss & Corbin, 1990:95; Sayre, 2001:202; Henning *et al.*, 2004:131; Strauss & Corbin, 2004:303) as was used in the present study. Coding is basically a form of categorising, labelling or indexing interesting things in research material (Babbie, 2004:309; Seale, 2004:300; Punch, 2005:199). Richards (2005:86), on the other hand, argues that coding is not merely done to label all the parts of the document, but rather to bring the parts together so that they can be reviewed and to develop the researchers' thinking about the topic. A good coding scheme relates the data to the literature review and is the bridge between the data and the theoretical points (Seale, 2004:300) as seen in the results and discussion of the present study (Chapter 6).

Open coding is the part of analysis that pertains specifically to the naming and categorising of phenomena through close examination of data (Strauss & Corbin, 1990:96, Sayre, 2001:96; Henning *et al.*, 2004:131; Punch, 2005:205) as was applied to the data of the present study. As indicated in Figure 5.2, during open coding the data or text are broken down into discrete parts, closely examined, compared for similarities and differences and questions are asked about the phenomena as reflected in the data (Strauss & Corbin, 2004:303).

Babbie and Mouton (2001:500) indicate that open coding can be executed in three different ways. Coding can be done in words, phrases (Yates, 2004:219) or line by line, which was the

strategy applied to the present study or sentence study and paragraphs seen as a whole or the whole book (Strauss & Corbin, 1998:120-121; Henning *et al.*, 2004:131; Strauss & Corbin, 2004:303). While this is time consuming and tedious, it generates several different categories. The researcher's own and others' assumptions about the phenomena are questioned and explored, leading to new discoveries (Strauss & Corbin, 1998:120-121; Henning *et al.*, 2004:131; Strauss & Corbin, 2004:303). In short, open coding fractures data into concepts and categories (Henning *et al.*, 2004:131; Yates, 2004:219; Punch, 2005:205) as applied in Chapter 6. Through coding, the researcher of the present study continuously suspended prior knowledge on the subject in order to enter the participants' phenomenological world and was able to understand their ideas, perceptions and experiences (Hayes, 2000:189). At this stage the researcher referred to the present study's objectives to assist in data analysis (Richards, 2005:94).

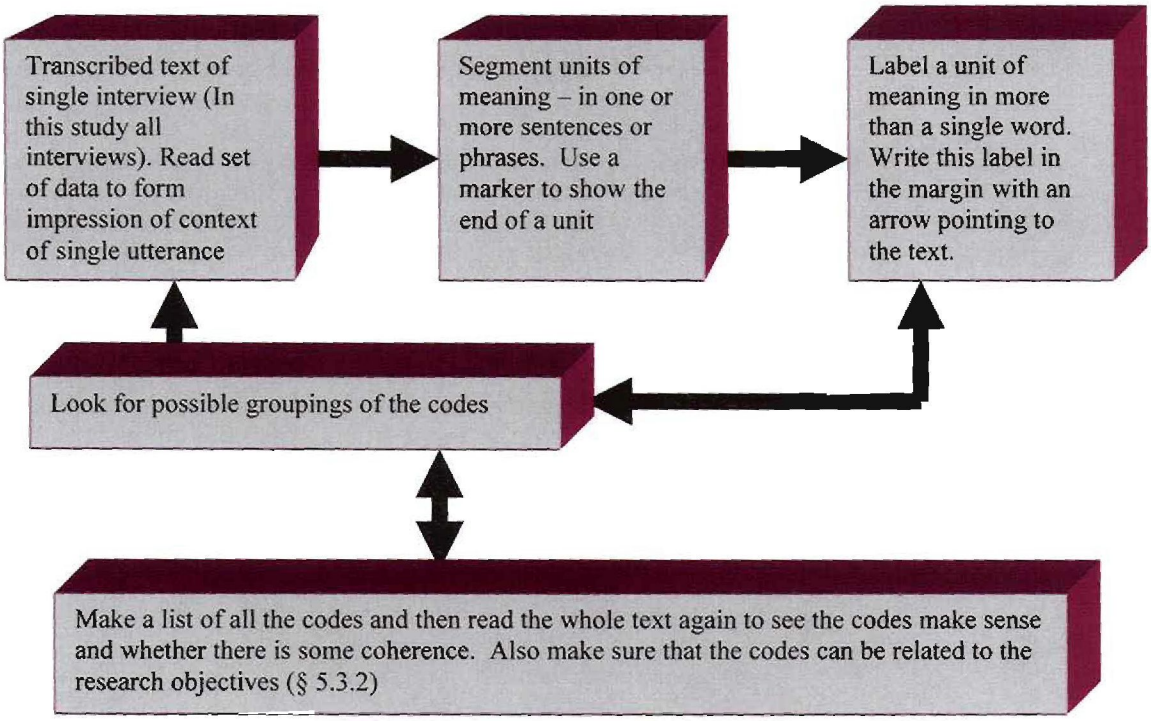


Figure 5.2 Coding from text (Henning *et al.*, 2004:104)

Krueger (1994:149) also indicated the following factors that the researcher needs to take into consideration during the analysis of the data:

- consider words (for example, to identify the additives more "top of mind");
- consider context (for example, motivation of participants who will or will not purchase food additive containing products (§ 6.3.3.8);
- consider the frequency or extensiveness of comments (such as the identification of re-emerging concepts (§ 6.3.3.4.1);
- consider the specificity of responses; and
- find the big ideas (the addition of chemical substance to food products (§ 6.3.3.1.1).

5.10.1.3 Categorising the data

After the data was conceptualised and the concepts labelled, the processes of grouping the concepts took place. The grouping of concepts that seem to pertain to the same phenomena, are called categorising (Carson *et al.*, 2002:83; Henning *et al.*, 2004:131; Strauss & Corbin, 2004:306; Yates, 2004:191,207). This step of data analysis should evolve over time from immersion in the data, in-depth consideration of the categories identified in the data and building upon them. The phenomenon represented by a category is then given a conceptual name as can be seen in the example provided in Figure 5.3. This name should be more abstract than that given to the concepts grouped underneath it (Strauss & Corbin, 2004:306). At this stage the analysis should link the theory to the data. It should be indicative of interrelationships, links and sequentially general interdependencies of the phenomena within the research context (Carson *et al.*, 2002:176). Flick (2002:199) further points out that the categories must be particularly relevant to the research question. Therefore, possible sources for labelling were concepts borrowed form the literature or those taken from the participants' expressions. The latter is called *in vivo* codes and are the most preferred option, because they reflex the participants opinions closer (Flick, 2002:199; Yates, 2004:206; Punch, 2005:200, 207; Richards, 2005:95).

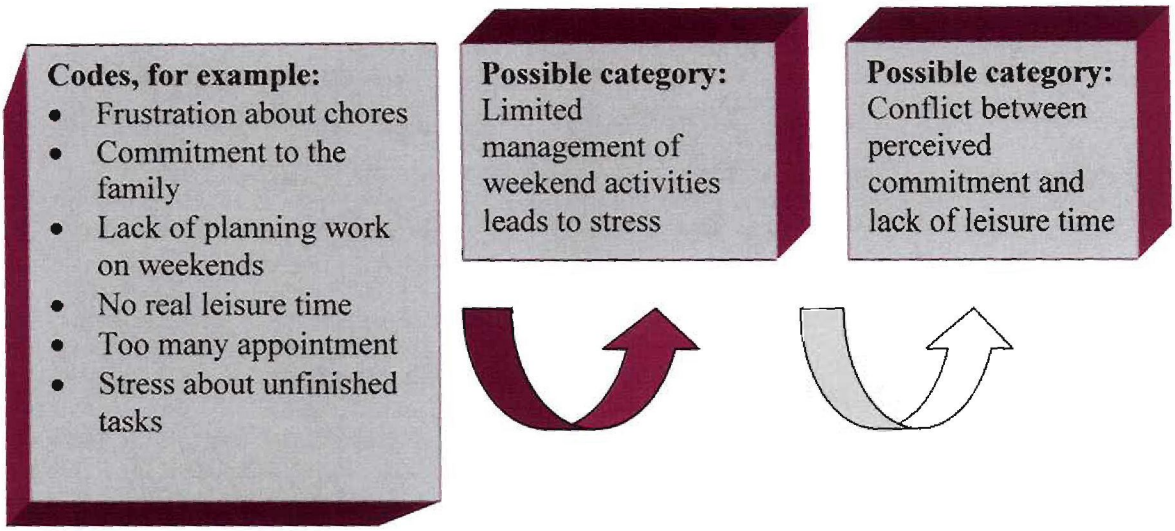


Figure 5.3 From codes to categories in qualitative content analysis (Henning *et al.*, 2004:106)

5.10.1.4 Identification of themes

The next step in data analysis was to identify general themes (Hayes, 2000:125; De Vos, 2005:248; Henning *et al.*, 2004:132). Themes are ideas or topics detected while analysing the transcriptions. For the purposes of analysis, each theme was colour coded to ease the identification of different themes as suggested by Hayes (2000:176). The themes were recoded and named according to the describing verbatim data (Hayes, 2000:177; Henning *et al.*, 2004:132). The themes were supported by the literature, while colleagues and other researchers reviewed all analysed data as mentioned by Richards (2005:99). The analysed data are presented in Chapter 6 (Tables 6.1-6.38). The third phase as indicated by Henning *et al.* (2004:138) was the final composition of the analysed data. This was accomplished by writing the final themes of the set of data and to present the patterns of related themes. According to Kvale (1996:199), interpretation is a theoretical understanding where interpretation is placed in a broader theoretical perspective.

According to Henning *et al.* (2004:106), Carson *et al.* (2002:176) and Spencer *et al.* (2005:213) the researcher should be able to "move backwards" through the process from thematic pattern back to categories back to codes and then to the raw data (Figure 5.4). Richards (2005:97) describes this process of revisiting of descriptive coding as a process of

discovery. As mentioned before, uncovering patterns, themes and categories is a creative process that requires making careful judgments about what is really significant in the data (Carson *et al.*, 2002:176).

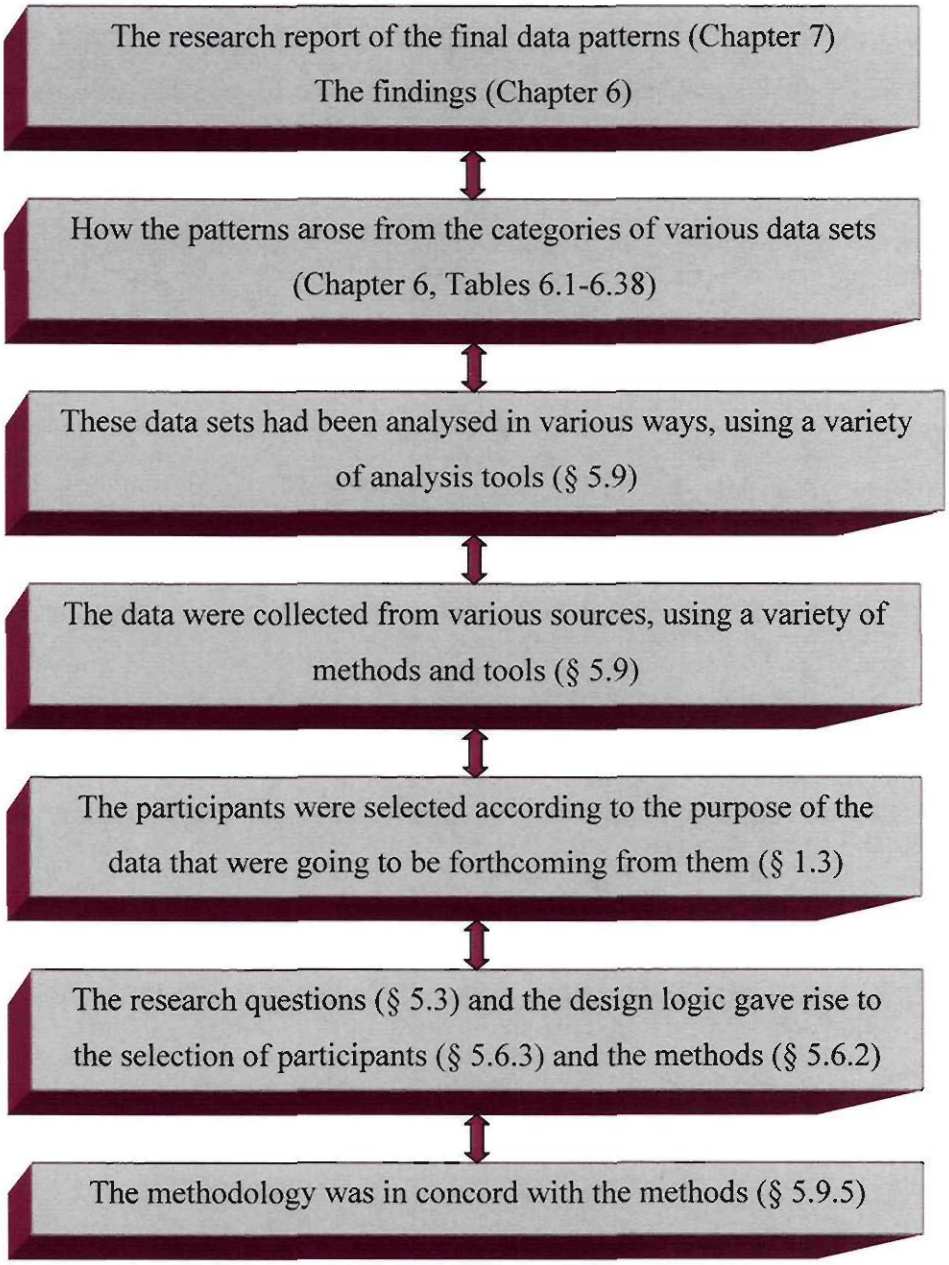


Figure 5.4 Moving "backwards" through the data working process: the process of tracking the rationalising of the data (Applied from Henning *et al.* (2004:108))

5.11 STRATEGIES USED TO ENSURE TRUSTWORTHINESS

During the execution of qualitative studies, the researcher in a sense becomes subjective to the research through his/her involvement in the data collection and analysis (Hoepfl, 1997:60). It is, therefore, important that the results obtained should be tested and evaluated to ensure validity and reliability (Silverman, 2000:175). Lincoln and Guba (2003:260) substitute the concept of trustworthiness as the overarching standard in qualitative research.

A number of qualitative researchers have explored alternatives to reliability, validity and generalisability (Kvale, 1996:198; Oates, 2000:195; Shank, 2006:114). Taken together the three concepts comprise the qualitative concept of trustworthiness (Shank, 2006:115). Lincoln and Guba (1985:372; 2003:260) developed four concepts of dependability, credibility, transferability and conformability (Table 5.4). Carson *et al.* (2002:67), on the other hand, mention only credibility, dependability and conformability as dimensions of trustworthiness. In Lincoln and Guba's (2003:260) more mature model, trustworthiness is seen as a more unitary concept, with its four aspects acting as facets that complement each other. In other words these four concepts represent the qualitative approach to validity (Shank, 2006:115).

The first concept of dependability refers to the ability to know where the data in a given study comes from, how it was collected and how it was used. The key strategy for ensuring dependability is an audit trail. Furthermore, dependability can be increased by member checks (LeCompte & Preissle, 1993:348; Miles & Huberman, 1994:347). Member checks occur when outsiders examine the notes and data of the researcher to make sure that data are saying what the researcher claim they say (Shank, 2006:114) as applied in Table 5.4.

According to Lincoln and Guba (1985:371), credibility deals with the degree of believability of research findings. Triangulation in data collection and extended contact with participants are important tools of credibility (Silverman, 2000:177; Shank, 2006:114). Guba and Lincoln (1981:297) postulated three techniques for assessing validity: triangulation, reflexivity and member checks. There is much debate about whether the value of triangulation is to validate qualitative evidence or if it lies in the extending understanding through the use of multiple perspectives. Ritchie (2005:44) argues that the security that triangulation provides is through

giving a fuller picture of the phenomena, not necessarily a more certain one. Triangulation of data collection and analysis helps to establish trustworthiness, face validity and catalytically validity (Bernard, 2000:177; Silverman, 2000:177). The concept of believability was applied to the present study as shown in Table 5.4.

Lincoln and Guba (1985:371) see transferability as the degree in which the results of a study can be transferred to a different setting or population. The primary tools for establishing transferability is adequate and detailed description in laying out all the relevant details of the research process (Shank, 2006:115). Lastly, conformability deals with the details of the methodology used. It can be determined via a methodology audit trail. The trail addresses issues such as the type and nature of the raw data, how the data was analysed and how the categories and themes were formed (Shank, 2006:115). Therefore, qualitative empirical findings will gain validity from these dimensions because of careful assessment and use of prior theory at various stages of the project (Carson *et al.,* 2002:67).

Weber (2004:120) mentioned that three types of reliability are pertinent to qualitative content analysis: stability, reproducibility and accuracy. Stability refers to the extent to which the results of content classification are invariant over time. Stability can be determined when the same content is coded more than once by the same coder. Reproducibility refers to the extent to which content classification produces the same results when the same text is coded by more than one coder. Accuracy refers to the extent to which classification of text corresponds to a standard or norm, although it is seldom used by researchers (Weber, 2004:121). Theoretical saturation is a great enhancer of external reliability (Babbie & Mouton, 2001:288). Saturation means that no new findings can be found (Shank, 2006:31). Reliability or trustworthiness refers to the believability (Maykut & Morehouse, 1994:64) of the research findings and can be achieved through various methods. The researcher used the model (Table 5.4) described by Lincoln and Guba (1985:385-391) to ensure trustworthiness, using the principles of Krefting (1991:212-222). In addition to the methods advised by Maykut and Morehouse (1994:127) in terms of peer reviewing and member checks, described in a similar way by LeCompte and Preissle (1993:347), Miles and Huberman (1994:348), Mays and Pope (2000:4), Carson *et al.* (2002:67-69) and Flick (2002:219-230) along with the question guide discussed by Babbie and Mouton (2001:278) were also included.

Table 5.4 Strategies applied to ensure trustworthiness in a study on participants' perceptions of food additives (Adapted from Lincoln and Guba (1985:385-391), Krefting (1991:212-222), Maykut and Morehouse (1994:147), Mays and Pope (2000:4), Babbie and Mouton (2001:276-278), Carson *et al.* (2002:67-69), Flick (2002:219-230) and Lichtman (2006:194))

Strategy	Criteria	Application
Credibility	Prolonged engagement	• Focus group discussions were held until data saturation occurred. • Adequate time of one hour was used for execution of focus group discussions.
	Triangulation	• Prompted and unprompted awareness questionnaires, focus group discussions were used as data collection methods. • Data collection of focus groups by means of verbatim transcriptions and field notes taken by moderator. • Concepts and themes were identified and argued by research team. • Literature review on food additive labelling, information sources and perceptions was done.
	Referential adequacy (Reflexivity)	• Field notes were compared to audio recordings and transcribed data.
	Peer debriefing/ review	• Raw data were analysed by a co-researcher. • Discussions with other researchers.
	Member checks	• Field notes taken by the moderator were discussed with the participants to ensure that the notes correspond with their opinions and views. • Concluding question check to control if all the issues regarding food additives were covered during the discussion.

Strategy	Criteria	Application
	Data collection techniques	• Pilot study on focus group discussions. • Pilot study on prompted and unprompted awareness questionnaires.
	Field experience	• A pilot study was executed to explore the research setting. • Eight focus group discussions were held. • Sufficient time was spent with the participants to allow them to verbalise their view on food additives. • Thirty nine participants completed the unprompted and prompted food additive awareness questionnaires.
Transferability	Sample selection	• Purposive sampling was used to minimize bias, recruiting participants displaying interest in food additive label reading. • Three in shops and three daycare centres were used to recruit participants in two different cities. • Inclusion and exclusion criteria were established. • Participants completed a screening questionnaire.
	In-depth description	• Description of the methodology used and results accompanied by verbatim quotations.
Dependability	Dependability audits	• Detailed analysis of themes and concepts controlled by experienced researchers. • The researcher (moderator) conducted all the focus group discussions.
	Dense description	• Detailed description of the methodology
	Triangulation	• Eight focus group discussions (n=39) were transcribed verbatim and compared to field notes • Different dates, places and different participants were used (Table 5.3). • Unprompted and prompted awareness questionnaires.

Strategy	Criteria	Application
	Peer examination	• Frequent discussions with colleagues.
	Question guide	• All participants were interviewed according to the same question guide, utilising the funneling technique.
Conformability	Conformability audit	• Raw data, verbatim transcripts and audio recordings were kept. • Data reduction and analysis products and synthesis products (Table 6.6-Table 6.38.) • Process notes were kept. • Material relating to intentions and dispositions were kept. • Question guide development information was kept. (Annexure J for pilot study guide)
	Reflexivity	• Field notes were made and used for data analysis.

5.12 SYNOPSIS

A qualitative exploratory study was undertaken which provided rich and meaningful data. Eight semi-structured focus groups were run comprising two to 11 participants. Transcripts of the focus groups were analysed using a Grounded theory approach of open coding. The transcribed text was coded, whereby data with a coherent meaning were indexed or given a concept label. It was, however, of utmost importance for the researcher to remain focused on the objectives of the study. The results of the study can only be trustworthy once the necessary steps are taken in advance as well as throughout the study. In consumer science where the consumer, who is often unaware of his/her behaviour, is the centre of research, a focus group method provided valuable results in describing and exploring consumer behaviour. In this study, focus groups were used to explore the perceptions of food additive label reading consumers, in terms of their knowledge concerning food additive terms, claims, concerns, risks and safety, the influence of different media exposure and the regulation of food additives. The data collected and the literature surveyed were used to develop a model of

consumers' perceptions of food additives and consequent purchasing behaviour. This process necessarily was influenced by the original research objectives as well as by the themes that emerged from the data themselves. The end product of this stage was a detailed index of data, which labelled the data into manageable chunks for subsequent retrieval and exploration.

From here the study advances towards the results and discussion of the empirical findings as shown in Chapter 6.

CHAPTER 6

RESULTS AND DISCUSSION OF RESEARCH FINDINGS

6.1 INTRODUCTION

The problem stated in Chapter 1 was what consumers' reactions are in response to statements about food additives in the popular media, as well as the information presented on food labels. It was further questioned what role consumers' perceptions of food additives play in a purchasing decision and, ultimately, how this information influences the consumers' purchasing behaviour of food products containing food additives. The literature synthesis in Chapter 2 shows that consumers are particularly interested in a range of food constituents but mostly focus on added chemicals, such as colourants, flavourants and preservatives. Unfortunately, the food label's information about chemical substances is usually designed by scientific experts and they, as well as various other stakeholders, do not know what the effect of such information is on the consumers' perceptions thereof. If the food additive information on a label is not compiled correctly, consumers may be misinformed and may purchase a food that they do not want. It was, therefore, necessary to investigate the way in which consumers acquire and process the information they are exposed to and how such information may influence their consequent purchasing behaviour in Chapter 3. The purpose of Chapter 4 was to apply the ELM on consumers' perceptions of food additive labelling in order to explain how consumers' information processing influences their decision-making and consequent purchasing behaviour of food products containing additives.

The question remains how a selected sample of South African consumers' perceptions of food additives influenced their purchasing behaviour. This question led to the design of an empirical study of an exploratory nature using a qualitative methodology as discussed in Chapter 5. The objectives of the empirical study were:

- to determine the consumers' awareness of food additives;
- to determine the effectiveness of sources which expose consumers to food additive information with specific reference to the role of the health information media, regulator and manufacturers of food;

- to determine to which extent consumer's information search for food additive information influences the purchasing behaviour of food products with regard to food safety and quality; and
- to determine how the reception of additive information influences the purchasing behaviour of consumers by exploring food additive claims and the ingredient contents list on food products.

The analysed data are presented in table format (Table 6.1-6.38). The purpose of this chapter is to present the results of the investigation and a discussion thereof.

6.2 RESULTS OF THE PILOT STUDY

Before the main study, a pilot study (Annexure J) was conducted in order to review the entire focus group plan. The objectives of the pilot study were to determine the sequence in which the focus group questions needed to be asked, general household procedures that needed to be in place, the time needed to complete the procedure, suitability of the venue used, testing of equipment to record information, training of the assistant moderators and practice for the researcher who acted as the moderator of the group. During the pilot study, the awareness scenarios (Written task one and two) and the vignette (Written task four) were also done as part of the focus group discussion, in order to determine the suitability, testing and adoption, as well as data analysis procedures to be used. The pilot study was conducted on 1 June 2005. Five participants, all staff members of the Vaal University of Technology interested in food additive labelling, took part in the pilot study.

The following adjustments were made to the pilot focus groups discussion guide in order to compile the main focus group discussion guide:

- The unprompted awareness questionnaire (Written tasks one) layout was adjusted to be only one page in length. The reason for this was not to discourage participants with too many open lines (Annexure J);
- The completion of the prompted awareness questionnaire (Written task two) was too time-consuming. Therefore, the 10 mimicked labels were reduced to two labels (Annexure J and I);

- Some of the focus group discussion questions were changed in order to be more focused on the objectives of the study. More emphasis had to be placed on questions pertaining to purchasing behaviour; and
- Written task three was omitted as the session became too long and participant fatigue was observed (Annexure J).

The data collected during the pilot study was not included during the data analysis of the main study.

6.3 RESULTS OF THE MAIN STUDY

The theories which were compiled from the data were discussed in the same order as was used for the collection of the data (§ 5.9). Care was taken during the translation of the Afrikaans statements into English to keep the meaning as close as possible to the original statements. The verbatim data was translated by an accredited translator and checked by the researcher for correctness.

6.3.1 Unprompted awareness

The objective of the unprompted awareness questionnaires was two fold. First the unprompted awareness questionnaire (Annexure G) was used as an ice breaker for the focus group discussion. The second objective was to determine the participant's awareness (§ 6.1). It is known from the literature review in Chapter 2 that some consumers were unable to describe the features of food additives correctly. Therefore, unprompted awareness was measured, which determined participants' ability to recall food additives and provided an indication of which additives are more "top of mind" than others and was to some extent a memory test. In other words, it gave an indication of how well information was evaluated and integrated in the memory, and how important the consumers perceived that attribute to be (Balasubramanian & Cole, 2002:113). At this stage no food additive information had been shown or explained to the participants as suggested by Paterson *et al.* (2003:2, 8) and Williams *et al.* (2004:33).

The participants were required to do three things:

- list as many additives as possible (**Participants ability to list food additive names**);
- link the listed additives with food products in which the particular additive mentioned are normally found in (**Food products containing additives mentioned**); and
- explain what was meant by the term "food additive claim" (**Knowledge about food additive claims**).

6.3.1.1 Results of participants' ability to list food additive names question

The following results were obtained when the participants were asked to list all the food additives they could think of:

- Tartrazine was the food additive name mentioned by most of the participants followed by MSG. Other food additives mentioned were aspartame, sucrose, sugar, salt, sodium benzoate, sulphur dioxide (SO_2), pimaricin, ascorbic acid, sodium nitrate, sodium nitrite and saccharin.
- Hardly any of the participants were able to mention more that six different food additives correctly. Notably it was not compulsary for the participants to mention any product names (see Annexure G).
- The participants found it difficult to list more than two food additive names correctly.
- The majority of the participants were able to mention one food additive correctly.
- A few participants were able to only write some food additive names with the correct spelling. Many were spelt incorrectly, such as pemarizin.
- Some participants could write only a food additive name partially such as benzo... or something that sounds like it, such as renal instead of rennet.
- Some participants were confused and mentioned food additive classes (such as colourants, flavourants and (various) preservatives, acids, sweeteners and vitamins) as food additive names (instead of tartrazine and MSG).
- Others indicated fat, carbohydrates, soy, caffeine, vanilla and spices as names of food additives.
- There was even a claim of "tartrazine free" and "trace elements of peanuts" mentioned as a food additive names.

- On the other hand, a respondent was able to mention and, therefore, distinguish between sodium nitrate and sodium nitrite as well as indicating sulphur dioxide by its chemical abbreviation SO_2.
- Sugar and salt were also indicated by some participants as food additives.

Similar to these findings, interviews with 500 Australian consumers found that only 39% were able to identify a food additive correctly (Bruhn, 2002:103).

6.3.1.2 Results of food products containing additives question

The participants were asked to give examples (optionally) of food products in which the additive they had listed can be found:

- The participants found it difficult to link the food additive they mentioned to a specific food product name;
- Some participants confused brand names (such as "Beacon" for sweets, "Clover" for milk products, "Aromat" for flavourant), product classes (such as diet products, sweets or cool drinks) and colourants (green and orange) with product names containing a specific food additive. They were supposed to say, for example, that MSG is found in soup powder;
- The five food classes mentioned the most as containing food additives were cool drinks and fruit juices, chips, sweets, yoghurt and diet foods;
- Participants indicated the functional classes of food additives and not a food product as was asked. Preservatives, colourant, flavourant and diet products indicated such vague statements; and
- Some participants considered herbs, spices and AB cultures (in yoghurt) as food additives.

6.3.1.3 Results of knowledge about food additive claim question

Most participants were unable or did not have the confidence to explain what a food additive claim means. They found the term unfamiliar as shown in Table 6.1. The importance of this finding is that consumers need to be familiar with claims in order to recall this information

(Solomon, 2004:101). One stated that a claim is a list of additives on the label (statement 6.1.10). Some participants further added that a claim is an endorsement of an organisation like Weigh-Less ™ and the Heart Foundation, indicating goodness and assurance (statements 6.1.16 & 6.1.17).

Table 6.1 Participants' understanding of the concept food additive claim

Category	Concept	Participants statements
Warning sign	Health condition	6.1.1. Warning, like allergy 6.1.2. It is a statement made by producers that indicated that the product is not harmful...
Uncertain	Unfamiliar	6.1.3. Have read it, but can't remember everything now. Have looked at the percentage of fat content. 6.1.4. Don't know exactly; information on label that indicates fat content and sugar content etcetera.
	Proposition	6.1.5. I think it's a statement that producers make according to which they say it isn't harmful, that it increases the shelf-life, etcetera. 6.1.6. Don't know exactly; information on label that indicates fat content and sugar content etcetera.
Additions	Colourants, preservatives and vitamins	6.1.7. Added colourants, preservatives, added vitamins. 6.1.8. ... or in the case of vitamins that are added. 6.1.9. Additives that are specifically added to food or drinks.
	Label information	6.1.10. List of additives that appears on label.
	Health association	6.1.11. An additive that is not mentioned on the label but has been added because it influenced health.
What is not added	Absence of ingredients	6.1.12. It is placed on a product to say that it is not in the product ... 6.1.13. Store X explains fully what is in the product and [states] possible allergies. Says if there is no MSG in the product. 6.1.14. Contains "No MSG". 6.1.15. Claim what is not in the product.
Assurance		6.1.16. ... and assurance from Weigh-Less and the Heart foundation that it is good for us. 6.1.17. It is a statement made by producers that it prolongs the shelf-life of a product.

Other participants confused additives with other unhealthy ingredients such as fat and sugar content (statement 6.1.3 & 6.1.4). A more elaborated explanation was that "It is a statement made by producers indicating that the product is not harmful and that it prolongs the shelf-life of a product" (statement 6.1.17). Other participants could identify that it is, for example, "No MSG", but were unable to explain the meaning thereof (statement 6.1.14). The main categories arising form the question of what a food additive claim is, was that it is a warning sign of what is added or not added to foodstuffs. Thus, from the perception of consumers a claim may be defined as a warning sign of what additives were added or not added to a particular foodstuff with the preposition that they do understand the term used.

6.3.1.4 Discussion of unprompted awareness questions

The results indicated that tartrazine, MSG and aspartame were more on "top of mind" that any other food additive. An Australian study investigating the biggest hazards to the safety of food also listed the food additive MSG to be more on "top of mind" (Williams *et al.*, 2004:34). The participants associated tartrazine mostly with snack foods such as soft drinks, sweets and chips and to a lesser extent with health products. MSG was associated with chips, preserved foods in cans or cartons and, more specifically, with soup powder and "Aromat", the brand name of a flavour enhancer. Aspartame was linked to sweetened diet drinks, cool drinks and diet products, yoghurt and "Beechies", the brand name for a chewing gum.

The incorrect spelling, incompletely written words, limited number of food additive names successfully recalled, general terms such as red or yellow colourants, the use of food additive categories, macronutrients, other ingredient names and food additive claims instead of additive names were all indicators that the participants were confused about additives. They were in general unable to use additive terms correctly, and were uninformed about using food additive terms, although they claimed that they were food additive label readers (§ 5.5.4.1) as defined in Chapter 5. The use of general descriptions for food additives by consumers is supported by McNutt *et al.* (1986:76). In general the participants found it difficult to link the specific food additive they mentioned with a specific product in which it is normally found. This may indicate that participants have a limited ability to avoid products containing

additives they may perceive as unhealthy effectively. The main theme arising from the question "what do you think a food additive claim is?" was that consumers used a claim as a source of health information, providing that they understand what the specific food additive claim means.

6.3.2 Prompted awareness

Prompted awareness is a more realistic and accurate measure of awareness. It measures recognition which is a more appropriate mental task and thus a more accurate measure of "true awareness" (Paterson *et al.*, 2003:2, 8). A measure of recognition of food additives was designed by the researcher (Annexure H). The participants were given a series of four different mimicked ingredient lists, depicting food additives present in orange juice (Tables 6.2-6.5). The participants were asked to advise a mother of a child with a tartrazine allergy (hypersensitivity) about which two of the orange juices were the best for her child to consume. Also see Annexure K for the analysis of the ingredient list as supported by the literature. Although the participants were asked to choose two juices, the importance of this scenario lies in the reasons the participants gave for selecting that particular juice. The aim was not to indicate which one was selected the most, as this study cannot be generalized to the total population. The best ones to select, according to the literature analysis (Annexure K), were juice 3 (As shown in Table 6.4) and then juice 2 (As shown in Table 6.3).

6.3.2.1 Results of prompted awareness scenario

As shown in Table 6.2 consumers would look at the "naturalness", the type, the amount and "bad"/dangerous additives (additives with a high perceived risk) when selecting orange juice for a child with tartrazine allergy. Hence, the category identified was that consumers scrutinize ingredient lists for additive contents thereby indicating that they were aware of the dangers that food additives might pose, specifically the amount and type used.

Table 6.2 Techniques and reasons used for selecting orange juice 1

Category	Concept	Participants' statements
Scrutinise ingredient list for additive contents	Natural or fresh product	6.2.1. Because it is natural minerals, H_2O and Vitamin C.
	Type of additive	6.2.2. Flavourants and non-sweeteners ...
	Dangerous/bad additives	6.2.3. ... contain sulphur dioxide which many people are allergic to.

The results from Table 6.3 show that consumers do use additive claims if they are available, and that they scrutinise the ingredient list for additive contents. This gives an indication that the participants were aware of food additive claims. Another category that emerged indicated that when consumers were unsure of themselves or had limited knowledge about additives, they would guess which product was the best for the scenario presented. Therefore, they were aware of additives but not sure how to use the information provided on the label.

Table 6.3 Techniques and reasons used for selecting orange juice 2

Category	Concept	Participants' statements
Search label for additive claim	Utilise claim	6.3.1. It claims that it does not contain tartrazine. 6.3.2. Tartrazine free on label.
Guess	Unsure	6.3.3. I think I have made the right choice.
	Limited knowledge	6.3.4. With the little bit of knowledge I have.....
Scrutinise ingredient list for additive contents	Product quality	6.3.5. Without tartrazine and a lot of additional additives to enhance the juice without necessarily making it better.
	Amount of additives	6.3.6. Contains second least preservatives. 6.3.7. The product has the least harmful ingredients in terms of allergies.
	Dangerous/bad additives	6.2.8. ... contain sulphur dioxide which many people are allergic to. 6.2.9. Preservative 'sulphur dioxide' is bad.
	Type of additive	6.2.10. ... 'sulphur dioxide' is bad, but I would say better than four's sweetener, 'clouding agent', 'tartrazine' and 'benzoic acid'.

Table 6.4 shown the reasons why participants chose orange juice 3. As mentioned before the best juice to select, according to the literature analysis (Annexure K), was juice 3 (Table 6.4). No new categories emerged in Table 6.4. However, new concepts of importance emerged. Participants selecting juice 3 were on the lookout for the "naturalness", product safety, least health risk and good additives. This was an indication of their awareness of various factors which they keep in mind when selecting products containing food additives. Participants also perceived less complicated products to be more favourable choices. As mentioned, juice 3 was the best juice participants could choose.

Table 6.4 Techniques and reasons used for selecting orange juice 3

Category	Concept	Participants' statements
Search label for additive claim	Utilise claim	6.4.1. It claims that it does not contain tartrazine 6.4.2. Tartrazine free on label
Guessing	Unsure	6.4.3. With the little bit of knowledge I have, I think I have made the right choice. 6.4.4. Taking a change – do not know what pimaricin is.
	Uncomplicated	6.4.5. Seems simple enough.
Scrutinise ingredient list for additive contents	Natural/fresh product	6.4.6. It seems as if it could be a more natural product; it doesn't have too many additives. 6.4.7. Orange cells in juice if natural. 6.4.8. Looks if it contains healthy ingredients, only one preservative. 6.4.9. Sound pure orange juice as if you would eat an orange. 6.4.10. Sound like fresh orange juice with cells and vitamin C.
	Product safety	6.4.11. Safer products to ingest- some contain vitamin C which is not harmful. 6.4.12. Preservative „OK". 6.4.13. Sounds safer and natural 6.4.14. ...but these does not contain sulphur dioxide which many people are allergic to.
	Good additive	6.4.15. ...contains vitamin C. 6.4.16. Does not seem harmful.
	Amount of additives	6.4.17. Least additives. 6.4.18. Contains few or no colourants. 6.4.19. ... I think product has least harmful ingredients for allergies.

Table 6.4 (continued) **Techniques and reasons used for selecting orange juice 3**

Category	Concept	Participants' statements
	Type of additive	6.4.20. Orange cells for fibre, sugar-free. Pimaricin is, although, an antibiotic, but seems to be safe. 6.4.21. No colourants, flavourants. 6.4.22. Least additives and absence of artificial sweetener.
	Least health risk	6.4.23. It's the purest and closest product that – I think – won't influence the allergies.

As shown in Table 6.5 no new categories emerged from the evaluation of orange juice 4. However, this category was consistently used in all four scenarios presented to the participants. That means that participants do use food labels to search for additives when asked to select a product that does not contain tartrazine.

Table 6.5 Techniques and reasons used for selecting orange juice 4

Category	Concept	Participants' statements
Scrutinise label for additive contents	Amount of additives	6.5.1. Not so many additives as one. 6.5.2. Contains few or no colourants.
	Dangerous/bad additives	6.5.3. … but these does not contain sulphur dioxide which many people are allergic to.

6.3.2.2 Discussion of prompted awareness scenario questions

The main theme arising from the prompted awareness scenario was that food additive label reading participants utilized a food additive claim if it is provided on the food label. Another theme was that participants scrutinise the ingredient list for food additives when asked to choose between two or more products for a potentially life-threatening health condition. When the participants were unsure of themselves they tended to guess which one was correct. These two themes gave an indication of the participants' awareness of food additives. The last phenomenon indicated a lack in participants' knowledge with the result that they cannot fully utilize the information provided on a product label.

In addition to the selection of the two best products, the participants were asked to name the additive listed in orange juice 3. Most participants mentioned pimaricin as the additive in the product. Others indicated both vitamin C and pimaricin as food additives. Some participants listed the word "preservative" as a food additive which could be an indication that they do not understand or were not aware of the use and function of the word preservative on labels. A few participants could not list any food additives. This could be an indication they were not aware of the specific food additives used in the product. Some of the participants listed a range of additives not listed in the ingredient list of orange juice 3. It may be that they did not understand the question or tried to impress the researcher with their knowledge about food additives. This phenomenon is termed as impression management and is defined as "misrepresenting the facts in order to win" (Hawkins *et al.*, 2004:208; Peter & Olson, 2008:438). This phenomenon has been reported several times in the literature (Flett *et al*, 1988:72; Leary & Kowalsky, 1990:34; Carneiro *et al.*, 2005:279).

Thus the type of information presented on product labels will influence the techniques that the label reader will use in product selection. Furthermore, awareness of additives may be linked to specific types of additives known to the participant.

6.3.3 Focus group discussions

Fifteen questions were asked following the funneling approach (§ 5.9.5.1). The data of each of the questions for all eight focus groups (n=39) were combined before analysis. The results for each of the questions were discussed in the same order as they were asked. First the question is given, and then the table describing the different sub-concepts, concepts, categories and themes, whereafter a discussion of the results of each question supported with statements from existing literature follows.

It is important to note in the analysis of qualitative data that a statement might be the viewpoint expressed by either a single, multiple or all participants involved in the focus group discussion.

6.3.3.1 Participants' general perceptions about food additives

Question 1: What is your general idea about food additives? Give reasons why.

The objective of this question (Annexure I, Question 1) was to determine consumers' awareness of food additives (§ 6.1). Four themes emerged from this question, namely:

- addition of chemical substances to food products (Table 6.6, § 6.3.3.1.1);
- specific benefits of food additive applications (Table 6.7, § 6.3.3.1.2);
- risks of food additive consumption (Table 6.8, § 6.3.3.1.4); and
- situational factors influencing food additive utilization (Table 6.9, § 6.3.3.1.5).

6.3.3.1.1 Theme 1: Addition of chemical substances to food products

Participants in this study (Table 6.6) regarded food additives as unnatural chemical substances added to food products which are bad for one's health as suggested in statements 6.6.1-6.6.3 and the corresponding category presented in Table 6.6. These statements were supported by Sloan *et al.* (1986:524) who argue that consumers fear food chemicals because they feel that the chemicals present hidden and unknown dangers. Furthermore, support for these (statements 6.6.1-6.6.3) were consumers' desire to avoid anything artificial and that this desire of consumers continues to grow (Sloan, 2004c:20). Consumers view chemicals as unnatural and unfamiliar (Yeung & Morris, 2001:177).

In contrast, other participants in the present study indicated that food additions such as vitamin fortification are regarded as beneficial for children's health (statements 6.6.4-6.6.5) and the general health of the consumer (statement 6.6.6 & 6.6.7). Nutritional additive can be used to restore nutrients to levels naturally found in foods (Swanson & Evenson, 2002:225). For instance, many ready-to-eat breakfast cereal products are fortified with several vitamins and minerals (Sumner & Eifert, 2002:32). Similar to the present study Sloan *et al.* (1986:529) found that consumers do approve of the addition of vitamins and minerals to food products and that consumers are positive about fortified food products. McNutt *et al.* (1986:74) named this phenomenon "positive nutrition characteristics". Thus participants of the present study

realised both the potential health risks and benefits of food additives. Both these aspects might influence consumers' purchasing behaviour (Peter & Olson, 2008:74).

The category of vitamin fortification as mentioned by participants in Table 6.6 (statements 6.6.4-6.6.7) can also been seen as a beneficial function of food additives (IFT, 1988:119). The benefits of food additives for consumers are, therefore, similar to the benefits for the processor (§ 2.6.1). The latter would be more interested in the benefit of additives that aid in the processing or preparation of manufactured products (Sumner & Eifert, 2002:28) that the participants did not mention.

Table 6.6 Theme 1: Addition of chemical substances to food products

Category	Concept	Participants' statements
Unnatural chemical substance	Synthetically manufactured	6.6.1. … something not natural that are put into products. 6.6.2. … unnatural, chemical agents. 6.6.3. Any unnatural additive ….
Vitamin fortification	Children's health	6.6.4. Vitamins … these days certain sweets are enriched with vitamin C … calcium-enriched yoghurt and suchlike. I want children to ingest calcium. 6.6.5. Things that are added for children's basic growth, for instance vitamins.
	General health	6.6.6. It is right if [things are] added. Yes, it is good. I would rather buy a product with added vitamins than one to which nothing has been added but lasts longer. 6.6.7. The addition of vitamins in some products ……. You must take extra vitamins it is good for you.

6.3.3.1.2 Theme 2: Specific benefits of food additive applications

As shown in Table 6.7 the theme about consumers' specific benefits of food additive applications comprised two categories, namely consumer benefits and manufacturer or retailer benefits. According to the results, the participants regarded food additives as beneficial to them as can be seen in the different concepts they were able to mention (statements 6.7.1-6.7.14). This is similar to the list of functions provided by Bennion (1980:120), FDA/IFIC (1992) and McWilliams (2005:550, 558). The participants in the present study omitted some

benefits, such as additives being used for leavening and pH control. This might be an indication that there is a need for consumer education regarding food additives.

Table 6.7 Theme 2: Specific benefits of food additive applications

Category	Concept	Sub concept	Participants' statements
Consumer benefits	Preservation	Shelf-life	6.7.1. I think it stands [on the shelf] for quite some time before it gets to us. [There is also the] time it takes to transport it from the factory to the dealer. Quite a time before you get it; you also keep it for a few days. 6.7.2. Important to stipulate dates – never mind preservatives, last for certain period.
	Replacement of ingredients	Food allergies	6.7.3. Naturally another reason as well. Make it available to people with specific allergies and problems so that they can also eat it, for instance if you can't eat sugar, that there will be an 'ordinary' sweetener or whatever, then the product can be beneficial to you, something you would otherwise not have used.
	Improve taste	Quality	6.7.4. Add some flavour to make the food taste different. 6.7.5. Additives could have something to do with taste. To add it so that it makes it taste better than it really does. But now one doesn't know what they add to it before the time, to this meat or that meat. They suggest some kind of taste to you to make you believe in the quality. 6.7.6. To make food taste better; could also spoil the taste at times with what you add. 6.7.7. … some are flavour enhancers, like MSG and so forth. To make you eat more without knowing why you are eating more. Sometimes it is to make inferior products taste better.
	Provide colour		6.7.8. ... to improve colour. 6.7.9. It adds to the … colour.
	Provide flavour		6.7.10. It adds to the flavour ...
	Improve consistency		6.7.11. Additives can give [gravy or] sauce a bit more 'body' if it is too thin 6.7.12. To give it more substance.

Table 6.7 (continued) **Theme 2: Specific benefits of food additive applications**

Category	Concept	Sub concept	Participants' statements
	Product enhancement		6.7.13. ... enhanced food, ... 6.7.14. Many additives – and frequently vitamins – are included, because in the process of cooking and preserving many of these are lost and [so they] are added as additional additives so that the product's nutritional value is increased.
Manufacturer or retailer benefits	Financial rewards	Improved quality	6.7.15. Make it attractive to children in particular, or to the buyer: red cold drinks [and] green attract their attention, red and green [and] yellow stuff for the buyer/market. [They also add] a preservative to make foodstuffs last longer. 6.7.16. Sometimes they [additives] are used to make inferior products appear better.
		Increased sales	6.7.17. It is all about sales. 6.7.18. It is an inexpensive way of preserving the product, but if the product is raw, such as real orange juice, it has a shelf-life of two days and with additives the shelf-life is 20 days. And that sells the product. 6.7.19. As long as they can sell it [even] if the product contains the acid or tartrazine that is harmful to humans.
		Affordability	6.7.20. Long shelf-life makes products much cheaper. But not Store X; all yoghurts contain preservatives, except those of Woollies. If you are willing to pay about R6 more, you get no additives.

The participants' perception of manufacturer or retailer benefits is seen as a financial benefit. This was described by the sub concepts of improved quality, increased sales and affordability as supported by statements 6.7.15-6.7.20. Moreover, it could be an indication that the participants perceived manufacturers as producers of products with the sole aim of making a profit. This is similar to the findings of Porter (2005:15).

In general, the above findings of the present study contradict the statement by Branen and Haggerty (2002:5) that consumers appeared to be unaware of the potential benefits of

additives. Although it is acknowledged by the researcher that Branen and Haggerty's (2002:5) statement was based on the consumers who read food labels, they were not food additive label readers (§ 6.3.1.4) as was the case in the present study. Benefits can be seen as a positive factor (Mucci & Hough, 2004:43) that influences purchasing behaviour positively.

6.3.3.1.3 Theme 3: Risks of food additive consumption

As indicated by Theme 3 (Table 6.8), the risks of food additive consumption, six important concepts about the health risks of food additives were mentioned by the participants. Participants indicated that food additives are detrimental to health (statements 6.8.1-6.8.5). This is similar to the findings of Williams *et al.* (2004:35), where more than half of the respondents believed that additives were harmful. The statements provided by the participants in the present study included both vague and more general statements, as indicated by words such as "bad", "not good" and "junk".

The next concept is hyperactivity in children and this is attributed to the participants by the consumption of additives, such as the colourant tartrazine (Wright, 1997:423; Williams *et al.*, 2004:35). The participants in the current study clearly indicated that the colourant red is the culprit. They attributed the general increase in allergies, another concept, they experienced in children to the use of additives and more specifically MSG.

The FDA (1994) as well as Hannuksela and Haahtela (2002:43) describe that adverse reaction towards certain food additives such as MSG, tartrazine, aspartame and sulphates may cause problems in certain individuals, but indicated that they regard these substances as safe for the general public. The prevalence of food additive intolerance is estimated at 0.00% to 0.23% among adults (Young *et al.*, 1987:241). Statement 6.8.9 is supported by the literature. According to Taylor and Hefle (2005:40) and the FDA (1994), it is estimated that the prevalence of food allergies continues to increase. The estimated percentage of USA consumers suffering from food allergies was 1% to 2% (FDA, 1994; Bruhn, 2000:5). The newest estimations indicate that 3.5% to 4.0% suffer from food allergies.

Table 6.8 Theme 3: Risks of food additive consumption

Category	Concept	Sub concept	Participants' statements
Health risk	Detrimental to health		6.8.1. It's not good for you... 6.8.2. Rubbish, don't like it. 6.8.3. Bad for children. 6.8.4. Peanut additive: read about 'traces of peanut' and people can die as a result of this.
	Hyperactivity		6.8.5. Tartrazine causes them to be extremely hyperactive – very bad. Keep away! Like Coke with all the sugar – it makes children very over-active. The same with caffeine. 6.8.6. My child ate sour worms today and I had an episode of hyperactivity. 6.8.7. I also keep my eyes open for the colourants at times. Red ones and suchlike, because I have also read that red makes children hyperactive. My [young] son isn't hyperactive, but he isn't far from it. A sweet or two too many and he keeps us busy. I don't buy red cold drinks, but I buy orange [the colour], but that still contains colourants.
	Allergies		6.8.8. Is allergic, for example, MSG and gelatine and many other agents as well, to many to mention... 6.8.9. Tremendous increase in allergies, especially in children.
	Increased sensitivity		6.8.10. ... only know tartrazine in Oros that makes me cough terribly; other products with tartrazine don't affect me at all. 6.8.11. ...children are ultra-sensitive if they ingest some of the other additives in various foodstuffs.
	Additive specific effects		6.8.12. As long as they can sell it [even] if the cold drinks contain the acid of tartrazine, for instance, that is harmful to one. 6.8.13. Keep away! Like Coke with all the sugar – it makes children very over-active. And caffeine as well. 6.8.14. Sometimes I also look for the colourants. Red ones and suchlike.
	Psychological effect	Brain damage	6.8.15. Additives can affect one's brain so that one is more easily influenced and that kind of thing. 6.8.16. There is another theory that it turns people into 'puppets'.
		Addiction	6.8.17. They make you addicted; you become dependent on them.

Consumer perception surveys indicate that even a larger percentage (10% or more) of households believe that one or more members of the household have a food allergy (Taylor & Hefle, 2005:40). Regardless of the accuracy of these perceptions, these consumers were likely to make purchasing decisions based on these perceptions. An interesting concept was the psychological effects participants attributed to the used of food additives. Statement 6.8.17 described a consumer perception that manufacturers used addictive ingredients, in order to facilitate repeated sales. No evidence could be found in literature to support this statement and could be investigated in future research.

In summary, perceived risk includes consumers' knowledge and beliefs about unfavourable consequences (Mucci & Hough, 2004:43). In a purchasing decision, consumers consider the benefits and risks of each choice alternative by integrating information about positive and negative consequences. Consumers are, therefore, unlikely to purchase products with a high level of perceived risk (Peter & Olson, 2008:75). In general the health risks perception of the participants was more focused towards children than adults.

6.3.3.1.4 Theme 4: Situational factors influencing food additive utilisation

The theme of the participants' situational factors influencing food additive utilisation is an important issue. Consumers' situational factors might differ due to a variety of factors as can be seen in the categories presented in Table 6.9.

Participants indicated their lack of knowledge with regard to food additives in statements 6.9.1-6.9.3. The concept of uncomprehensive information is supported by statement 6.9.4, indicating their ignorance to such terms. Participants mentioned that they did not know what the scientific names and E-numbers on the label meant. Previous studies found that a large proportion of the respondents using food additive labels found them confusing and difficult to understand (Prättälä *et al.*, 1985:243; Crawford & Baghurst, 1990:231; Crowe *et al.*, 1992:20; Worsley, 1994:223; Abbott, 1997:47; Wandel, 1997:213; Kidd, 2000:55).

Table 6.9 Theme 4: Situational factors influencing food additive utilisation

Category	Concept	Participants' statements
Lack of knowledge	Uncomprehensive information	6.9.1. If it is genuine information, it is good information. I have a daughter who is a diabetic, so it is very important to me to know what is in a product. But you never really know what it means, because figures don't really tell you much. 6.9.2. ... don't know about E-numbers. We don't know about that. It isn't good. 6.9.3. Highly academic names on labels put me off. I don't know what it is and it isn't user-friendly either. It causes us to be ignorant of what we are ingesting. [I would] need a scientist to go shopping with me to tell me what it contains.
	Ignorance	6.9.4. Generally we are very ignorant of what is really on that label.
Ethical issues	Distrust	6.9.5. Hidden agenda. 6.9.6. I am of the opinion that we are totally bedevilled by advertisements. I don't believe that there are additives in the products, because there is no proof. All we have to go by is what the advertisements say. I am looking for some organisation that can prove to me that there are so many additives, after the product has been packaged. 6.9.7. I think they are purposely confusing us with regard to these additives. 6.9.8. [I have a] reasonably strong point of view about all these things. Many people don't look; just take it and eat it. It is very obvious that the large companies, like drug companies, insert the words 'added Vitamin C' and 'added Vitamin E' ...it's just to deceive us so that we will forget about the other rubbish. Just chuck in a whole lot of other rubbish and don't even show it on the label. 6.9.9. The box says seven things have been added, but it doesn't say they have taken away 14 things to get it the way it has been made. It makes me very angry. I am in favour of the additives. 6.9.10. In the end I think it's just a distortion of the words.
	Insufficient legislation	6.9.11. South Africans trust too easily – no watchdogs that say it should be like this or like that. And who is it that says it contains this or that?
Time implications	Convenience	6.9.12. Never turn around to see what's in it; never have time to read labels, buy packet, go home [then only read the label], if it is done in 15 minutes its fine.

Wandel (1997:214) indicated that Norwegian consumers also did not understand what the E-numbers meant and found that respondents want to know what foods contain, which is similar to statement 6.9.1. Thus a lack of knowledge may create a situation of uncertainty during the food shopping experience which may influence the consumer's purchasing behaviour. Moreover, participants expressed their perceptions about such terms as "not user friendly". Therefore, lack of knowledge may be a blocking mechanism (§ 3.4.1.2) in their purchasing decision (Rousseau, 2003a:117; Cant *et al.*, 2006:196) because participants do not have the ability to do so (Engel *et al.,* 1993:407).

Participants' statements 6.9.5-6.9.10 indicated that they do not trust the label information as provided by the food manufacturers as found in previous studies (Garretson & Burton, 2000:218; Balasubramanian & Cole, 2002:120; NCC, 2003:7; Przyrembel, 2004:364; Porter, 2005:4; Lando & Labiner-Wolfe, 2007:161). Statement 6.9.9 is confirmed by Tuormaa (1994) who stated that processed foods which have lost a substantial proportion of their nutritional value through processing procedures sometimes contains added vitamins and minerals in inadequate ratios.

Contrary to the participants' perceptions of distrust (statement 6.9.5-6.9.10), the Regulation Relating to Labelling and Advertising of Foodstuffs (SA, 2007) is indeed promulgated to protect consumers from the most illegal and fraudulent practices by manufacturers and retailers. South African food label regulations are ahead of those in many developed countries (Van de Venter, 1997:5; Neall, 2002b:7). In addition, the DOH work with retailers to eradicate the source of illegal and misleading food labels by encouraging them not to give shelf space to illegal and misleading labelled products. Booysen of the DOH as quoted by Neall (2002a:27) said that "by law, retailers are responsible for what's on their shelves and they can act effectively as our policemen as we don't have such manpower". From the above discussion it is clear that the participants' perceptions of distrust (a negative factor) in food labels may indeed hold some ground.

It is further suggested in statement 6.9.11 that South Africa has insufficient food legislation. Similarly, in a study by Porter (2005:19), participants believed that there is a need for food regulation in the UK. As mentioned before South Africa does have sufficient food regulations

but the question remains how good the control of these regulations is. Smith and Riethmuller (2000:850) argue that consumers must rely on the integrity of the food industry and the ability of the government to regulate and protect the consumer against food safety risks.

Time implications were the last category in the theme about situational factors influencing food additive utilisation (statement 6.9.12). A participant indicated that she has limited time to shop, indicating that label reading is inconvenient. Similarly, Norwegian participants thought that reading the labels took too much time or was too cumbersome (Wandel, 1997:213). Freeland-Graves and Nitzke (2002:103) further argue that the lack of time is one of the most significant influences affecting food choices of consumers who are experiencing a rapid changing lifestyle, especially in Western societies. Time as a situational factor can manifest itself in a number of ways. The amount of time available for the purchase has a substantial impact on the consumer decision process (Hawkins *et al.*, 2004:488). Park *et al.* (1989:423) indicated clearly that decision-making quality deteriorates when the shopper is under time pressure, thus implying time or lifestyle influences as another barrier in food additive label reading.

6.3.3.2 Participants' perceptions of manufacturers' use of food additives

Question 2: Why do manufacturers use food additives in their products? Explain your answer. For what other reasons? Give reasons, and provide examples.

Similar to question 1, the purpose of this question (Annexure I, Question 2) was to determine consumers' awareness of food additives (§ 6.1). The four themes that emerged from this question (Tables 6.10–6.13) are as follows:

- consumer benefits (Table 6.10);
- unethical motivations from manufacturers (Tables 6.11);
- marketing strategy(Table 6.12); and
- consumers' uncertainty (Table 6.13).

6.3.3.2.1 Theme 1: Consumer benefits

According to the participants' perceptions, manufacturers use food additives to provide some benefits to consumers and simultaneously facilitate their marketing strategy (Table 6.10). Two categories were identified under the theme of consumer benefits (Table 6.10). The first was improved product quality (statements 6.10.1-6.10.10) with the concepts of colour enhancement, taste improvement and preservation of quality. These concepts can be regarded as product-intrinsic stimuli (Hansen, 2005:502). Stated differently, product attributes (such as colour, taste and quality) are the benefits that consumers want from a product.

Table 6.10 Theme 1: Consumer benefits

Category	Concept	Participants' statements
Improve product quality	Colour enhancement	6.10.1. Enhance colour, make better to the eye... 6.10.2. If you buy something without preservatives and colorants it will be dull. 6.10.3. Child looks at the colour. 6.10.4. Otherwise it is dull and boring and nobody is going to buy it.
	Taste improvement	6.10.5. ... taste better make you addicted to it without going overboard. 6.10.6. ... and flavourings give it a good taste.
	Preservation of quality	6.10.7. With certain products one can't do otherwise. Fruit juice is 100% but it also contains a lot of sugars. Must be preserved otherwise it goes off in the box. Long-life milk as well... 6.10.8. Must do something else – on the shelf and in your cupboard for a long time. 6.10.9. I also think it is to make it last longer... 6.10.10. Put more stuff in it because the stuff goes off. The tins will go off.
Ensure consumer convenience	Time reduction	6.10.11. Manufacturer makes it very easy for the consumer to just use it. That's why they add it. 6.10.12. Convenience foods – quick and easy. It takes longer to prepare and cook natural products – TIME! – Get home late and it's easier to use a tin of something.

The second category which the participants regarded as of importance is that manufactures must ensure consumer convenience (finding supported by Grunert *et al.*, 2003:435), with the specific purpose to reduce the time spent by the consumer on food preparation (statements

6.10.11-6.10.12). Consequently consumers use a range of criteria (sensory stimuli) such as appearance, taste, quality and convenience in evaluating food product attributes and thus, making purchasing decisions. Consumers fulfill their needs, wants and goals by searching for information about certain criteria in order to reach their goals. As shown in the statements 6.10.2-6.10.4 the consumers looked for specific criteria and ignore some other criteria. This is called perceptual vigilance (§ 3.2.4.4). The theme of consumer benefits (Table 6.10) compared well to the category of consumer benefits as presented in Table 6.7. This strengthens the fact that participants do recognize some of the consumer benefits of food additives. These benefits (a positive factor) in turn can influence consumers' purchasing behaviour (Peter & Olson, 2008:74).

6.3.3.2.2 Theme 2: Unethical motivations from manufacturers

Participants further indicated in Theme 2 the unethical motivations manufacturers utilize to sell their products (Table 6.11). In addition, there were participants who were uncertain why manufacturers use food additives.

Table 6.11 Theme 2: Unethical motivations from manufacturers

Category	Concept	Participants' statements
Fraudulent product quality	Dishonesty	6.11.1. What happens sometimes – I have experience of this – is that at first when they market a new product, then you can buy it, it is a quality product. After sometime the product's quality deteriorates, and in the end it is just like all the other products on the shelf and the price stays the same or it rises. 6.11.2. For example, Chinese sweet and sour sauce. Products become inferior as time goes by. 6.11.3. They're deceiving us. 6.11.4. I think manufacturers are not always honest about their products. If it says AB, does it or doesn't it contain AB? I have a problem with the genuineness of the manufacturers. 6.11.5. Yes, I have heard that – preservatives – that they do not use the most expensive products on the market, then they use an inferior product that is nearly, but not quite as good.

As shown in Table 6.11, participants indicated that manufacturers sometimes have unethical motivations for using food additives in order to enhance the quality of food products. Participants' statements 6.11.1-6.11.5 explained the concept of dishonesty by manufacturers. Proudlove (1990:2) indicated that the food industry has been accused of using poor quality raw materials and of masking this poor quality by the use of a range of additives, however, strict quality control procedures and specifications are applied to raw materials. For example, the FSANZ for food additives indicated that food additives should not be a substitute for GMP (Brooke-Taylor *et al.*, 2003:378). Hence the intention of food legislation is to eliminate fraudulent practices and the adulteration of foods (Przyrembel, 2004:361).

Sloan *et al.* (1986:529) quote a statement from one of the participants in their study which is similar to statement 6.11.4. The participant said: "I don't believe they really add them". The concept of dishonesty is important as it indicates what the perception of the participants is about manufacturers. This perception might be a blocking mechanism for the consumers. Thus this blocking mechanism as discussed by Rousseau (2003a:114-115) in the consumer's decision-making process might influence consumers purchasing behaviour unfavourably.

6.3.3.2.3 Theme 3: Marketing strategy

As shown in Table 6.12 regarding the theme of marketing strategy, the visual appearance of a product is a vital selling feature. Colourants (statement 6.12.2) has been used to modify the appearance of a product to make it more attractive to the consumer (IFT, 1988:122; Proudlove, 1990:8; Bareham, 1995:25) and is, according to Fraser (1993b:37), solely used as a marketing device. Similar consumer viewpoints as statements 6.11.1 & 6.11.4 in Table 6.12 were reported in a UK study (Kidd, 2000:54).

Another UK study found that consumers have little knowledge and understanding about food processors' and manufacturers' operations (Porter, 2005:14). In addition, consumers see manufacturers' role as a little mysterious, and the more consumers learn about them, the less they trust them. Participants in this study further indicated that supermarkets were entirely profit-driven (statements 6.12.6 & 6.12.7) (NCC, 2003:5; Porter 2005:15) and could not necessarily be trusted to provide safe food (Porter, 2005:15). A similar statement to statement

6.12.8 was quoted by Sloan *et al.* (1986:529): "It is just a word to sell the product". Hence the participants see food additives as a promotional tool.

Table 6.12 Theme 3: Marketing strategy

Category	Concept	Participants' statements
Financial benefits	Increase sales	6.12.1. Must preserve for a longer shelf-life to sell the products. 6.12.2. ... we would rather buy red stuff than transparent stuff. Children look for colour – would rather buy red stuff. If the appearance is good, it will sell better. 6.12.3. It's all about who can sell their products best and that's why the stuff is added. 6.12.4. If, for instance, they can preserve something so that it lasts longer than someone else's [product], they think that they can stake a claim on their product. It lasts longer than someone else's, so then people would rather buy theirs. Like the preservatives, for example: the longer the shelf-life, the fewer of the products are sent back, so the products can remain on the shelves for years, until everything has been sold. 6.12.5. I think for better sales, like the yoghurt with the AB culture.
	Increased profit	6.12.6. Another is to make money from the next. 6.12.7. Get a discount on mass sales and so the profit increases.
	Product promotion	6.12.8. ... because they see it contains a vitamin. It is enrichment of foodstuff. So it is also a form of advertising to sell the product faster. 6.12.9. I often get the idea that manufacturers compete with each other, and that they often add things to make a product more marketable.

In the third theme participants indicated that manufacturers used food additives as a marketing strategy in the category of financial benefits. These benefits were made up of the concepts increased sales, increased profit and product promotion. This corresponds with Theme 2 (§ 6.3.3.1.2) of question one (Table 6.7) and more specifically, the concept of financial rewards. The repetition of these concepts is an indication that consumers have a strong perception that manufacturers are using food additives in their products with the main aim to make a profit. The participants correctly know that the primary objective of a business is to achieve a profit (Cant *et al.*, 2006:9). In summary, some participants feel that the manufacturers use food additives for their own financial benefit, thereby deceiving consumers (a negative factor).

6.3.3.2.4 Theme 4: Consumers' uncertainty

Apart from the participants who could explain why manufacturers use additives (Table 6.12), some participants indicated that they were uncertain why manufacturers add food additives to their products. The concept that emerged from statements 6.13.1-6.13.3 was that some consumers were uninformed, have a lack of food additive information and could be an indication that they need consumer education. In addition, consumers' ability to comprehend food additive information is largely determined by their existing knowledge in the memory (Peter & Olson, 2008:119). Thus, consumers have different levels of product knowledge, which they can use to interpret new information and make purchasing choices. Consumers have three types of product knowledge: knowledge about the attributes or characteristics of products, knowledge about the positive consequences or benefits of using products and knowledge about products, attributes that help consumers to satisfy or achieve their needs (Peter & Olson, 2008:69, 71).

Table 6.13 Theme 4: Consumers' uncertainty

Category	Concept	Participants' statements
	Uninformed consumers	6.13.1. Have no idea. 6.13.2. Things that I can't understand: the MSG they add to meat and stuff – why can some people take it out and others have it free? And other people can't? If it is possible, why must they add it? I find it hard to understand. 6.13.3. I find it too complicated to read.

Consumers need enough knowledge to be able to take full advantage of the information provided on the food labels (Shannon, 1994:43; Wandel, 1997:214), although limited knowledge can stimulate an information search (Assael, 1995:228; Sheth & Mittal, 2004:287-292). Furthermore, knowledge enhances consumers' ability to understand a message. Beliefs are formed about food additives by accumulating knowledge (beliefs) regarding relevant attributes. Next the consumers evaluate these beliefs and form a feeling about the product (affect). Finally, based on this evaluation the consumer engages in a relevant behaviour such as buying the product (Assael, 1995:89). Knowledge can help consumers recognise faulty logic and erroneous conclusions and avoid incorrect interpretations. Knowledgeable persons

are more likely to elaborate on message claims, whereas unknowledgeable consumers may focus on non-claim cues (such as pictures or packaging) within the message (Engel *et al.*, 1993:408). Thus uninformed consumers are more likely to follow the peripheral route to persuasion (§ 4.4.5.2) (Petty & Cacioppo, 1986:8).

6.3.3.3 Participants' awareness and perceptions of E-numbers

Question 3: What do you think the E-numbers listed in ingredients lists mean? How does it influence your purchasing decision?

The purpose of question three (Annexure I) was to determine consumers' awareness of food additives (§ 6.1). The results of this question led to the description of two themes, namely:

- participants' knowledge of E-numbers (Table 6.14, § 6.3.3.3.1); and
- influence of E-numbers perception on purchasing behaviour (Table 6.15, § 6.3.3.3.2).

6.3.3.3.1 Theme 1: Participants' knowledge of E-numbers

Three categories emerged that can describe the participant's knowledge of E-numbers as stated on the ingredient list. The three categories were:

- consumer were uninformed;
- literate or knowledgeable consumers; and
- unconcerned about E-numbers.

Statements 6.14.1-6.14.6 clearly indicate that some of the participants who are food additive label readers do not know E-numbers and found it confusing (statement 6.14.7). Similarly, Wandel (1997:214) found that many participants in Norway did not know what E-numbers meant. Wright (1997:419) and Nancarrow *et al.* (1998:113) argue that E-numbers cause great confusion in the minds of consumers.

Table 6.14 Theme 1: Participants' knowledge of E-numbers

Category	Concept	Sub concept	Participants' statements
Uninformed consumers	Unknown numbers		6.14.1. Clueless. How does one read the number? I prefer that they put each product's name on it. 6.14.2. … do not have an idea, or is it the one who is better tested? 6.14.3. If you send your child into the shop to get something quickly – she doesn't know about it at all. She knows what Mom buys and she buys the same. Otherwise people must be educated about this matter. 6.14.4. I wouldn't know if they put tartrazine's number on the packaging, so they would be able to 'hide' it in this way and I wouldn't even know about it. 6.14.5. I don't know anything about the numbers. I don't have time to find out. 6.14.6. I don't know what it stands for, but I simply decided: these things, I don't like them.
	Confusion causing		6.14.7. This is a great problem to me, because it is very confusing to people who have no knowledge of such things.
Literate consumers	Gradings of food additives		6.14.8. It is like a grading system. 6.14.9. I think one is E620/621, MSG.
	Abbreviation for food additives		6.14.10. It is an 'abbreviation' for it …
	Another name for food additives		6.14.11. Just a name.
	Codes for food additives		6.14.12. ... still the same thing, but now it has a code... 6.14.13. … – code says there is something I must be careful of.
	Association with foods	Genetically modified foods	6.14.14. I heard something about its being allocated to genetically modified foodstuffs that have E-numbers.
	Association with types of food additives	Colourants flavourant and preservatives	6.14.15. I read these are colourants. 6.14.16. ... like colourants and flavourings that are actually carcinogenic; that spread throughout the body.

Table 6.14 (continued) **Theme 1: Participants' knowledge of E-numbers**

Category	Concept	Sub concept	Participants' statements
			6.14.17. ... all these colourants; each one has a different number... 6.14.18. ... whether it is a colourant or preservative or flavouring.
	Association with product risks		6.14.19. More risky the [product with] 10 numbers ... 6.14.20. Whether it is harmful to one or not. I don't even know if I am right or wrong. 6.14.21. ... but I don't use anything with E-numbers; it's rubbish that you ingest.
	Association with poisonous components		6.14.22. I read once – but I don't know if it's true – that these are actually all the poisonous things...
	Quantity of different food additives		6.14.23. We always try to avoid things with all those numbers and many names and all the additives...
	Deceit by manufacturers		6.14.24. ... and the manufacturer hides something behind the number. 6.14.25. It still means the same thing, but now it has a code but they don't know it is the same thing, so now they buy it. 6.14.26. I wouldn't know what it is if they put tartrazine's number on it, and so they can disguise it and I wouldn't even know. 6.14.27. Where does it come from? Who decided to insert an E number instead of the proper description? 6.14.28. It makes one wonder whether people are really well-informed. 6.14.29. There is no proof or any written information that tells you what it stands for.
	Consumer concern		6.14.30. It's a great concern to me what they do and what they cause.
	Association with goodness		6.14.31. ... there is some good ones, 10 – 12 E's that's okay, it's vitamins.
Unconcerned			6.14.32. I don't even read E-numbers. The print is too small. 6.14.33. I just don't take notice of it. 6.14.34. Ignore it till I get to the fat content.

Other participants who claimed to be literate about E-numbers explained, quite correctly, in statements 6.14.8-6.14.13 that E-numbers are a grading, abbreviation, other name or codes for food additives. This is an indication that the participants do to some extent understand E-numbers. Worsley (1994:225) found that 56% of the Australian respondents understand E-numbers. The purpose of the E-numbering system is to provide a simple and convenient way to label permitted food additives across the range of languages in the EU (Jukes, 2001:2, Branen & Haggerty, 2002:2; EUFIC, 2004a:3). It is interesting to note that participants did not mention that E-numbers were permitted food additives. That left the researcher with the question of what the participants know about the approval process of food additives (statement 6.14.27).

Some participants associated the E-numbers with foods such as genetically modified (GM) foods. This statement (6.14.14) indicates participants' confusion of both E-numbers (food additives) and GM foods. The literate participants also associated E-numbers with certain types of additives such as colourants, flavourants and preservatives (statements 6.1415–6.14.18). This fact is only a half-truth as E-numbers include all approved additives in the EU except for added vitamins (Jukes, 2001:2, Branen & Haggerty, 2002:2; EUFIC, 2004a:3). This finding indicates that there is a gap in the participants' understanding of E-numbers. Although the annexure of the South African regulation (SA, 2007:61) lists all the additives together with their E-numbers and prescribe the use of the common name in the ingredient list, the regulation does not prescribe to manufacturers how to use E-numbers on food labels. This is an indication that some participants can make associations about E-numbers but there is still a grey area that can lead to confusion.

In statements 6.14.19-6.14.21 some participants associated the E-numbers with product risks and either avoid products with E-numbers or associate the higher E-numbers with a higher risk ("More risky the [product with] 10 E-numbers [than one E-number]"). This is in accordance with the findings from Wandel (1997:214) where participants indicated that the more additives included in the ingredient list, the more negative this was in terms of health. Statement 6.14.23 is closely linked to the above-mentioned statements where the concept of the quantity of food additives used in a product indicates to the participants that products with higher amount E-numbers should be avoided.

One participant associated E-numbers with poisonous components (statement 6.14.22) although he/she was not sure about the correctness of this statement. Kajanne and Pirttilä-Backman (1996:214) found that interviewees compare food additives with poisonous substances. The flow of reasoning was that food additives are chemicals and chemicals are poisonous and, therefore, additives would be poisonous substances. Armitstead (1998:96) indicates a decline in the numbers of consumers claiming to avoid E-numbers, indicating the consumers are less concerned about E-numbers. However, some consumers regard additives and hence, E-numbers as detrimental to health and would probably avoid them (Wright, 1997:4; Wandel, 1997:214). In addition, Drew (1999:168) indicated that among those who look at ingredient labels, 44% say they avoid E-numbers in general.

Statements 6.14.24-6.14.29 shown that participants think that they are deceived by the manufacturers. Furthermore, participants in the present study have the perception that manufacturers hide information by making use of the E-numbers instead of using the chemical names. This fact was confirmed by Bruhn (2002:103). Wandel (1997:216) recommended that the E-numbers should be replaced by chemical names of the food additives used in food products, as chemical names are more informative. Statement 6.14.29 further indicates that participants do not know where to find the explanation of E-numbers. Contrary to the concept of deceit by manufacturers, Humphries (1998:193) found that consumers in a UK study implicitly trusted the food industry not to deceive them. The question could, therefore, be asked how trustworthy do consumers in SA perceive the food industry. This is a concept that should be investigated further in future studies.

Goodness was associated with some E-numbers (statement 6.14.31) because participants indicated that the E-numbers represent vitamins. Comparably, Abbott (1997:46) found that the prevalence of nutritional myths such as that E-numbers imply undesirable food additives, was small. However, only 24% of all subjects knew what kind of ingredients were given as E-numbers in a study by Przyrembel (2004:363).

Lastly some participants indicated that they are unconcerned about the E-numbers (statements 6.14.32-6.14.34). In general E-numbers are stimuli that consumers take into consideration when reading product labels and they have specific perceptions about E-numbers. Thus

consumers' knowledge about E-numbers appears to be fragmentary. In addition, a lack of knowledge and misunderstanding can cause consumers to avoid products that offer important benefits (Bruhn, 2005:488). Manufacturers, regulators and consumer educators should take these perceptions into consideration during the labelling of food.

6.3.3.3.2 Theme 2: Influence of perception of E-numbers on purchasing behaviour

The question whether E-numbers influence participants' purchasing behaviour was categorised according to the level of purchasing involvement, as shown in Table 6.15. Three concepts emerged: no purchase (statements 6.15.1-6.15.3), selective purchase (statements 6.15.4-6.15.6) and low purchase involvement.

Table 6.15 Theme 2: Influence of perception of E-numbers on purchasing behaviour

Category	Concept	Sub concept	Participants' statements
Level of purchase involvement	No purchase		6.15.1. Yes, it tells me I don't like to buy it if I see the E-numbers... 6.15.2. [It is unfamiliar] ... That's why we don't buy it. 6.15.3. I don't buy it. I specifically want to see what is in it.
	Selective purchase		6.15.4. Buy [everything], only not tartrazine. 6.15.5. No; if I feel like it I buy it. 6.15.6. Have my list with me, keep it with me when I buy products. ... I can't remember which E goes with which name, go back to my list.
	Low purchase involvement	Time constraint	6.15.7. ...you must have a list to check, and don't always have the time. 6.15.8. Not at all [influence purchasing behaviour], there isn't the time.

With "no purchase", participants indicated that they will not buy a product having E-numbers in the ingredient list. On the other hand, with "selective purchase", some consumers will buy a product in the absence of the E-number or additive they want to avoid. With "low purchase involvement" the participants select the product regardless of the presence of the E-numbers or additives they want to avoid due to a time constraint. As mentioned before, time is a situational factor can manifest itself in a number of ways. The amount of time (compare

Tables 6.9, Table 6.10 and Table 6.15) available for the purchase has a substantial impact on the consumer decision-making process (Hawkins *et al.*, 2004:488). In a German study, participants stated that the presence of food additives listed with their E-numbers were an influence to buy or not to buy a food product (Przyrembel, 2004:364). Thus E-numbers do influence participants' purchasing behaviour in a variety of ways, depending on whether they want to avoid additives or have situational factors influencing them.

6.3.3.4 Participants' concern and coping strategies with food additives

Question 4: What about food additives concerns you? Give reasons, explain why.

The objective of this question was to demonstrate participants' concerns regarding possible risks of additives. This could offer a possible explanation for the reasons why consumers search for more information about additives and how these concerns might influence their purchasing behaviour. In addition, Bruhn (2005:489) argues that to communicate information about food risks effectively, the full range of consumer concerns must firstly be identified. Furthermore, retailers need to know the concerns of their consumers in order to have an adequate response to these concerns (Brom, 2000:129). It is important to note that consumer concerns about food additives affect their perceptions about the product in question and can affect future purchasing decisions, as well as the reputation of the retailer and producer (Smith & Riethmuller, 2000:842). Two themes emerged from the question. (Annexure I, Question four).

6.3.3.4.1 Theme 1: Participants' concerns about food additives

Participants indicated with the first theme (Table 6.16) what about additives concern them. The nine categories of the participants' concerns about food additive concerns are discussed in the following section.

In the category of type-specific concerns (statements 6.16.1-6.16.17), the participants indicated that they are concerned about certain types of food additives. These different types

are indicated as the sub concepts. The additive names mentioned were sodium benzoate, tartrazine, MSG and aspartame (Table 6.16). These can be regarded as additives more on "top of mind". This is similar to the results of the unprompted awareness questionnaire (§ 6.3.1.4). Only one new additive name was identified, namely sodium benzoate. The rest of the additives mentioned are described as additive categories (Flowerdew, 2000:74; McWilliams, 2005:550; SA, 2007:43). The categories mentioned in this study were colourants, preservatives and flavourants. This is similar to the findings of Klein (2005:73) and ACNielsen (2005b). In statement 6.16.3 the participant indicated that even the colour of the seeds in a can of green beans was green. Thus these consumers see the addition of colourants by manufacturers as an action to make the food unrecognisable to the consumer (Wandel, 1997:218).

Table 6.16 Theme 1: Participants' concerns about food additive

Category	Concept	Sub concept	Participants' statements
Type-specific concerns	Type of food additives	Colourants	6.16.1. Especially red colourants ... 6.16.2. ...colourants ... 6.16.3. . ...but that they take the matter too far. Even the seeds of canned beans are coloured green. 6.16.5. Sudan red.
		Preservatives	6.16.6. All the preservatives that are added break down people's systems. 6.16.7. I think preservatives are necessary – not all of them. [It ensures reasonably fresh foodstuffs.]
		Unnatural chemical substances	6.16.8. . ... anything that comes out of a laboratory is not good for you. Things that come from nature are good for you.
		Sodium benzoate	6.16.9. Sodium benzoate...
		Tartrazine	6.16.10. Tartrazine...
		MSG	6.16.11. MSG – preservatives bound to a glutamate molecule. Glutamate is also present in one's brain [in neurons] that are used to 'fire' impulses from one neuron to another...
		Aspartame	6.16.12. I keep a lookout for aspartame. 6.16.13. ...Aspartame – tremendous conjecture about this.

Table 6.16 (continued) **Theme 1: Participants' concerns about food additive**

Category	Concept	Sub concept	Participants' statements
		Flavourants	6.16.14. The same with flavourings. 6.16.15. ... but the flavourings worry me to some extent...
		Hormones	6.16.16. Hormone additives to make things grow faster are totally unacceptable. 6.16.17. Cattle hormones could influence our men. They ingest female hormones and that leads to homosexuality...
Product-associated concerns	Type of food products	Yoghurt	6.16.18. ... if I buy yoghurt.
		Chips	6.16.19. ...in "chips"
		Diet sodas/cool drinks	6.16.20. ...and the sugar in 'Coke Light'... 6.16.21. ... especially stuff they add to diet cold drinks.
		Flavourant	6.16.22. ...and Aromat...
		Sugar	6.16.23. ... I never take white sugar... 6.16.24. ... sugar...
Symptom-associated concerns	Symptoms related to food additives	Cancer	6.16.25. Cause cancer... 6.16.26. Every second person gets cancer and gets it from food. It's shocking.
		Allergies	6.16.27. ... allergic ...
		Asthma	6.16.28. ... it also aggravates asthma symptoms or it can cause asthma symptoms. 6.16.29. ... asthmas...
		Headaches	6.16.30. ... severe headaches ...
		Deficiencies	6.16.31. I think the greatest epidemic is that people develop a deficiency of the vitamins and minerals their bodies need.
		Brain diseases	6.16.32. ... major reasons for brain disorders such as Alzheimer, Parkinson's, etcetera...
		Fertility	6.16.33. ... all the additives of the female hormones; to make the chickens grow better. And that causes infertility in the men.

Table 6.16 (continued) **Theme 1: Participants' concerns about food additive**

Category	Concept	Sub concept	Participants' statements
	Symptoms specific to children	Hyperactivity in children	6.16.34. …and hyperactivity kids, they are hyper, they become absolutely nuts … 6.16.35. A few years ago [there were] no hyperactive children, it's the present generation… we ingested some additives when we were pregnant with our children. 6.16.36. ….think small children get hyperactive… 6.16.37. ... how many people and children are sick? Children who ought to be running around and playing are in hospitals as a result of the food mom gives them. Children have to take medical stuff, medication, for sinus, hyperactivity. I think they could be healthy if they just ate the right food.
		Accumulation of additives in children	6.16.38. … whatever accumulates in a person's body, and especially in little children's [bodies], is detrimental, as far as I'm concerned.
		Reduced immune function	6.16.39. We are becoming sicker people all the time. We can't handle a normal thing like a cold. Especially not children.
	Cumulative effect of long-term use	Harmful effect	6.16.40. Over a very very long period some of this stuff will really affect you … 6.16.41. All the preservatives that are added weaken people's systems, slowly but surely. 6.16.42. Liver and kidneys pack up after all the years of eating the wrong things... 6.16.43. It builds up in your body. 6.16.44. Your body puts up a great fight against all the foreign stuff. 6.16.45. It could contain 10 additives, but you are allergic to only one, and so you start developing problems as time goes by.
		Poisoning effect	6.16.46. Poisonous, the majority [of additives], worse for some people, I never take white sugar, some people can take it, … the immune system must be very good. 6.16.47. It is a progressive process of poisoning and in the long run it is going to get you. 6.16.48. It poisons your kidneys, liver and [finally] your whole body.

Table 6.16 (continued) **Theme 1: Participants' concerns about food additive**

Category	Concept	Sub concept	Participants' statements
Information specific concerns	Effect children		6.16.49. I want to know what causes children to become hyperactive ... 6.16.50. .... Children should not drink red cold drinks. Why not?...
	Information confusion		6.16.51. ... why do they have to make things so complicated? 6.16.52. ... and one can't keep track of all the things that are added... 6.16.53. New things are added all the time...
	Identification concern		6.16.54. Most of the time one doesn't know what they are or the symptoms they cause... 6.16.55. ... I don't know its name... 6.16.56. ... and what makes people infertile...
	Information distrust		6.16.57. ... and even if you read up [about it] there are naturally hundreds of opinions, so in the end, is it really good for you to eat it? 6.16.58. This is how they catch us, and we don't know much about it. I couldn't say whether it is the truth. 6.16.59. The people who add these things don't see anything wrong in doing it. We eat the stuff.
Financial gain of manufacturers	Increase sales		6.16.60. ... and rather to make it sell better.
	Increase profits		6.16.61. ... so that farmers can make a profit more quickly. It's all about making money...
Product quality concerns	Quality deterioration		6.16.62. ... because I believe many of the additives detract from the quality of the food just so that it can be made to last longer... 6.16.63. .... just the same with flavourings. It seems like an inferior taste, with synthetic flavourings. 6.16.64. It doesn't make sense to me. My common sense tells me something has to be lost in the process. 6.16.65. Tinned food has a 'tinny' taste and a 'floury' taste.

Table 6.16 (continued) **Theme 1: Participants' concerns about food additive**

Category	Concept	Sub concept	Participants' statements
	Distrust in local produce		6.16.66. If it's a good product I will buy it if it's better than [the product made] in SA. 6.16.67. Our own bottled water that the children are so fond of. They [SA] tried to export it, but it was sent back from Europe immediately. Contains too many harmful things. Europe is very strict.
Consumer concerns	Quantity		6.16.68. The mixture and the quantity could cause problems.... 6.16.69. The average household will get a fright if they see how much they ingest.
	Unfamiliar products		6.16.70. Even worse, it's foreign to us. We are afraid of our own country's additives. Other countries don't care at all ... what they dump here. [It] is sold at a lower price than products we can produce here. 6.16.71. Cheap sweets from the East cause great concern.
	Research needs		6.16.72. Research must tell us what the effect will be; will it improve or be in order? In other countries they remove the products from the shelves. 6.16.73. ...additives are not sufficiently researched...
Helplessness	Unavoidable consumption		6.16.74. ... there is really nothing we can eat that is both tasty and healthy... 6.16.75. Sugar and tartrazine are found in terribly many things and in everything that children like, and that is bad for their health. 6.16.76. ... read about toxins and become worried. 6.16.77. It is bad for you and you have to eat it! 6.16.78. Yes, but what can we do about it?
Children's unhealthy eating habits	Parents ignore healthy eating habits of children		6.16.79. Very, very, greatly concerned ... Parents don't do anything about helping their children to eat healthy food. Nobody is interested about what they ingest. 6.16.80. It is distressing what children eat. One has a hard job to get them to eat wholesome food.

A sub-concept of importance was unnatural chemical substances (statements 6.16.8) (Table 6.16). This can be compared to the category in question one (Table 6.6). Participants were not describing additives as artificial ingredients *per se*. Up to this stage the word natural appeared only eight times and artificial once. Thus the participants were using these terms sparingly. Nevertheless, it is the opinion of the researcher that the participants do see additives as artificial ingredients but did not state this. This phenomenon will be discussed in more detail later. There is an indication that the concepts "natural" and "artificial" were used more widely in other studies. In a study done in Ireland it was found that information regarding artificial colourants and additives on food labels was given priority by consumers (Shine *et al.*, 1997b:293). Ingredient lists on food labels were scrutinized by 50% of shoppers, mostly to avoid artificial flavourants and colourants. Drew (1999:168) indicated that among those who look at ingredient labels, 40% claim to avoid artificial flavourants specifically.

In the category of product-associated concerns, the participants were disturbed by the concept of the types of food products in which additives are used. Product classes which the participants were concerned about were yoghurt, chips, flavourants, sugar, diet sodas and cool drinks (statements 6.16.18–6.16.24) (Table 6.16). In contrast to this, subjects in a Finnish study indicated foods with a high additive content causing concerns were bread, canned foods, soft drinks, sweets, convenience foods, sausages, juices and jams (Prättälä *et al.*, 1985:241).

The symptom-associated concerns category included the following sub-concepts, which were supported by the literature:

- cancer (statements 6.16.25-6.16.26): Multiple studies over the years indicated consumers' concerns about the relationship between additives and cancer (Prättälä, 1985:240; McNutt *et al.*, 1986:77; Sloan *et al.*, 1986:524; IFT, 1988:119; Abbott, 1992; Rowe & Briggs, 1995:5; Bruhn, 2000:6; Branen & Haggerty, 2002:7; Paterson, 2002:4; Williams *et al.*, 2004:35);
- allergies (statement 6.16.27): Publicity and consumer perceptions about food allergies has led to an increased consumer concern about food additives (Prättälä e*t al*, 1985:240; Sloan *et al.*, 1986:524; Young *et al.*, 1987:241; Crowe *et al.*, 1992:20; FDA, 1994; Abbott, 1997:45; Bruhn, 2000:6; Paterson, 2002:4);

- asthma (statements 6.16.28-6.16.29): The literature showed that MSG is the food additive mainly linked to an asthmatic reaction (Young *et al.*, 1987:241; FDA, 1994; Seftel, 2002:2, Paterson, 2002:4; EUFIC, 2004a:2). Furthermore, many patients suffering from any type of food additive reactions have asthma (Fraser *et al.*, 2000:240; Hannuksela & Haahtela, 2002:46);
- headaches (statements 6.16.30): There is some evidence that consumers mostly related headaches to MSG (Sloan *et al.*, 1986:525; Rowe & Briggs, 1995:5; FSANZ, 2002b; EUFIC, 2004a:2);
- brain diseases (statement 6.16.32): High levels of aspartame can cause brain damage (FDA, 1994); and
- fertility (statement 6.16.33): Reproductive problems are linked to additives, although there is no direct evidence that linking additive consumption with their occurrence in humans (Winter & Francis, 1997:86; Branen & Haggerty, 2002:7).

Prättälä *et al.*, (1985:240) confirmed that consumers most common concern about food additives were allergies and cancer.

The concept of symptoms specific to children should be explained in more detail (statement 6.16.34-6.16.37). This concept included the following three sub concepts:

- hyperactivity in children: In a South African study (Paterson, 2002:1), most participants indicated that MSG cause hyperactivity;
- accumulation of additives in children: No literature could be found in this regard; and
- reduced immune function: No indication in the literature could be found that food additive decrease immune function in the body. Only some immunologic reactions to food additive were reported (Hannuksela & Haahtela, 2002:46).

Tuormaa (1994) confirms that children are more susceptible to food additives. Concern over food additives, particularly with regard to adverse effects on children, is a long established issue, although one that tends to ebb and flow in terms of its profile and relative importance to consumers (LFI, 2007:1). In the 1970's Feingold's hypothesis was widely published which led to an increased concern about food additives (Tuormaa, 1994; Breakey *et al.*, 2002:88), even though scientific research could not find any association between food additives and hyperactivity (EUFIC, 2004a:2; FDA, 1992).

The following discussion relates to the concept of cumulative effect of long-term use (statements 6.16.40-6.16.45), which surfaced from the sub-concepts of harmful effect and poisoning effect. Toxicological problems resulting from the long-term consumption of additives are not well documented, although most existing and all new additives must undergo intensive toxicological evaluation before they will be approved for use (Branen & Haggerty, 2002:7). At the same time few additives are used at levels that will cause a direct toxicological impact, although a few incidents where this happened have been documented (Branen & Haggerty, 2002:7). However, Sumner and Eifert (2002:39) argue that all chemicals have some inherent toxicity. Similar to statements 6.16.46–6.16.48, Fraser (1993b:30) indicated that many members of the public perceive additives to be poisonous synthetic substances. Consequently the participants' negative perception about the cumulative effect of long-term use of additives might influence their food choice and ultimately their purchasing behaviour.

Some participants stated that they cannot identify food additives that cause concern to them (statements 6.16.55-6.16.56). These findings were confirmed by Kidd (2000:55) where participants indicated that they are concerned about the lack of information, lack of knowledge and feelings of confusion about food safety. Additionally, the concept of information distrust emerged (statements 6.16.57-6.16.69). Persuasion or behaviour change is less likely to occur if the information about additives is not seen as being truthful (Bredahl, *et al.,* 1998:270). Brom (2000:131) argues that consumer concerns are often considered to be signs of a decrease in trust. In the ELM model, trustworthiness is one of the components of source credibility (Hawkins *et al.*, 2004:401; Cant *et al.,* 2006:153) and is a motivational factor (Worsley, 1994:229). Therefore, a decrease in trust or distrust can act as a barrier in the information processing and can influence purchasing behaviour.

The category of financial gain of manufacturers is re-emerging. In the present study financial gain of manufacturers was a matter of concern to the participants (statements 6.16.60-6.16.61). Both the concept of financial reward of question one (as indicated in Table 6.7) and the category of financial benefits of question three (as shown in Table 6.12) were seen as a manufacturer's benefit. Therefore, the perception of financial gain of manufacturers might influence consumers' beliefs and purchasing behaviour negatively.

Some participants indicated that product quality concerns were more specifically related to quality deterioration (statements 6.16.62-6.16.67) of the product due to the addition of additives. In statement 6.16.65 a participant argued that synthetic flavourants make a product inferior. Synovate (2005:34) confirmed that respondents regarded the absence of artificial additives, preservatives and additives as quality attributes in food products. Previously (Table 6.7), the participants indicated that additives can improve the quality of products but solely with the benefit for the manufacturer (statements 6.7.15-6.7.16). The participants correctly indicated in the sub concept of quality, that additives can be used to improve taste (Question one, Table 6.7, statements 6.7.4-6.7.7).

Interestingly, some participants demonstrated distrust in the quality of local produce (statements 6.16.68-6.16.69). This confirms participants' general uncertainty about food regulations in South Africa. This is in direct contrast with the proudly South African labelling scheme and thus indicating the need of such a scheme. Furthermore, the distrust in local produce, as signified by country-of-origin labelling (Humphries, 1998:195) might act as a blocking mechanism which signals for consumers to avoid purchasing local produce they perceive to be of inferior quality.

In the category of consumer concerns, participants indicated that they are concerned about the quantity of additives a person consumes as well as unfamiliar products that are available in the market today (statements 6.16.70-6.16.73). More than 2500 different additives are intentionally added to foods (Branen & Haggerty, 2002:1). It was estimated that Westerners consume an average of 4.5kg of food additives per year (Tuormaa, 1994). Therefore, the participants have reason to be concerned about the levels of additives they consume.

In addition, participants indicated a need for research regarding the safety of food additives (statements 6.16.72-6.16.73). Branen and Haggerty (2002:6) admit that there is not always adequate scientific proof whether or not a particular additive is safe. Thus statements 6.16.72-6.16.73 are true reflections that more research is needed in his regard. Research needs can be seen as a coping strategy of consumers that needs to be in place to ensure that food additives are safe for the health of consumers. In general coping strategies can be seen as alternative behaviours to enhance existing circumstances (Freeland-Graves & Nitzke, 2002:102).

In the category of helplessness, participants indicated that the consumption of some additives is unavoidable (Table 6.16, statements 6.16.74-6.16.78). This was a matter of concern for the participants and they clearly did not know what to do about the situation. This concept was not found in the literature. This might be an indication of a unique perception of South African consumers and should be investigated further. The question could also be asked about how useful label reading activities are for the consumer in attempts to avoid food additives.

Finally the category of children's unhealthy eating habits emerged (Table 6.16). It included the concept of parents' ignorance about the unhealthy eating habits of children (statements 6.16.79-6.16.80). The unhealthy eating habits of children have been researched in a variety of projects (Tuormaa, 1994). It was mostly found that children do not eat breakfast and thus consume crisps, sweets, chocolate and carbonated drinks during the mid morning break.

In summary, the participants identified a variety of concerns about food additives (Table 6.16). Brom (2000:133) argues that when consumers have real concerns, their trust in food regulators disappear. The dilemma for the food industry is that perceived concerns are unlikely, difficult and/or costly to change (Smith & Riethmuller, 2000:853). Regardless of the medical accuracy of concerns about food additive allergies, consumers are likely to make purchasing decisions based on these perceptions (Taylor & Hefle, 2005:59). Therefore, food concerns are related to food choice habits (Wandel, 1994:211). In contrast, Prättälä *et al.* (1985:238) argue that the verbally expressed concern about food additives did not conform to actual purchasing behaviour. This inconsistency between perceptions or opinions and behaviour is a well-known phenomenon in the social sciences.

6.3.3.4.2 Theme 2: Participants' coping strategies to reduce concerns

The second theme indicates what strategies consumers use to reduce their concerns (Table 6.17). Avoidance strategies used by consumers are not new. Sloan (2003a:48; 2004a:20; 2004b:26; 2007:32), Wandel (1997:218) and Prättälä *et al.* (1985:238) reported that consumers try to avoid or limit the intake of additives, preservatives, pesticides and sugar more that ever before. Some participants in the present study indicated that they do read labels and use preventative purchasing as strategies to reduce their concerns about additives. It is

evident from studies conducted that consumers are more concerned about the nutrients they wish to avoid rather than attaining a balanced diet (Shine *et al.*, 1997b:290).

Table 6.17 Theme 2: Participants' coping strategies to reduce concerns

Category	Concept	Participants' statements
Avoidance strategies	Label reading	6.17.1. ... If I were to hear that I have a hyperactive child I would read the labels, when you hear the child is hyperactive.
	Preventative purchacing	6.17.2. Must be very careful in selecting products and sure [it does not contain additives]. 6.17.3. We seldom buy prepared foods because they usually contain it [food additives]. 6.17.4. My child is a diabetic number one, so now I give my child less cool drink. 6.17.5. ... don't want to take it if I can help it. 6.17.6. There are some of the nutrients that one can't avoid.
Unconcerned consumption	Unaffected consumers	6.17.7. ... not really, because I have not really paid much attention to it. 6.17.8. No problem; shelf-life and taste improve; no bad consequences for humans. 6.17.9. [If you] don't have a problem then you don't read and you just buy. 6.17.10. Not paranoid all the time. 6.17.11. ... we don't necessarily look at it, because we are in too much of a hurry even if we know we are not getting all our vitamins... 6.17.12. If I'm a healthy person it won't worry me and then I'll eat anything. 6.17.13. No, not really. I don't worry about it. 6.17.14. No time to slice vegetables. 6.17.15. The pace is so fast that one makes more use of convenience foods.

The concept of preventative purchasing strategies was supported by the finding of various studies (Sloan *et al.*, 1986:523; Prättälä *et al.*, 1985:238). A participant read the label in order to avoid food additives (statement 6.17.1). Coping strategies suggested to limit the use of food additives (statements 6.17 2-6.17.6) were individual efforts to buy additive-free foods and the use of home-made foods which are prepared from unprocessed raw materials (Prättälä *et al.*, 1985:238). Serville (1977:192) identified six types of reactions to potentially dangerous food components. These reactions included:

- complete rejection;
- limiting consumption;
- search for alternative;
- resignation; and
- acceptance or negation of the risk.

All of the above types of consumers' reactions were found throughout the present study and will be discussed in the model of consumers perceptions about food additives and consequent purchasing behaviour (§ 7.2.5).

The last category indicated that some participants were unconcerned about the consumption of dditives. Even though these participants claimed that they are additive label readers, many indicated that they are unaffected in general by food additives (statements 6.17.7-6.17.15), except for a specific few they keep on the look out for.

6.3.3.5 Participants' perceptions of food additive risks

Question 5: What are the risks of food additives?

The researcher asked this question (Annexure I, Question 5) with the objective to determine the consumers' awareness of food additives because it could be a possible indication of the reasons why consumers search for more information about additives. One **theme** emerged, namely **participants' perceptions about food additive risks** from this question (Table 6.18). Also refer to Table 6.8 about "Risks of food additive consumption" (§ 6.3.3.1). In Table 6.18 the category of health risks are similar than those in Table 6.8 but new concepts emerged (Table 6.16, § 6.3.3.4).

The participants identified the concepts of type-specific risks and symptomatic effects of food additives. In type-specific risks, cancer, allergies and hyperactivity were mentioned again (statements 6.18.1, 6.18.3 & 6.18.4). Participants also indicated more illnesses which they felt were increasing. These included illnesses such as ADD, ADHD, osteoporoses, increased blood sugar levels, diabetics, muscle aching and cramps (statements 6.18.2-6.18.6).

Table 6.18 Theme: Participants' perception about food additive risks

Category	Concept	Participants' statements
Health risks	Type Specific risks	6.18.1. Cancer – major problems, allergies, ADD and ADHD especially are on the increase amongst children. 6.18.2. [High] glucose levels, osteoporosis, diabetes are on the increase. Becoming common; in the past only here and there. 6.18.3. Attention deficit hyperactivity disorder is on the increase; especially among children. 6.18.4. ...hyperactivity, eczema. 6.18.5. ... muscular aches and pains and muscular cramps are also on the increase. 6.18.6. On the increase: multiple sclerosis, fibromyalgia, Atkinson's Disease [diet?].
	Symptomatic effect	6.18.7. Body will tell you. You don't feel well
Ethical risks	Distrust in manufacturer	6.18.8. Worries, big companies have money and use [it] to their own advantage unfortunately. Drug companies are great culprits. They misuse power and money, buy and bribe people to sell their products and [this] makes them even more powerful. The small fry try to draw people's attention to their products, but the big guys squash them.
Educational risk	Lack of information	6.18.9. Will have to learn the numbers first ...
	Block information	6.18.10. Terrifying. I am a novice person, now I am scared of all these things.
	Uniformed	6.18.11. ... thought they put all of this on the label just to fill it [with writing]...
Lifestyle risk	Time constraints	6.18.12. Think it has to do with lifestyle. Everyone is in a hurry – SCARY! Don't live as people did in the past; make food in a hurry; eat in a hurry; do everything in a hurry – always in the fast lane.

The next category of ethical risks explained the concept of distrust in the manufacturer (statement 6.18.8). Thus participants perceived the manufacturer as having a lack of credibility. The credibility of the manufacturer is an important component in the ELM model (Petty & Cacioppo, 1986:172; Antonides & Van Raaij, 1998:212; Solomon, 2004:258). Consumers' perceptions of food safety is related to the level of trust and confidence they have

in the food industry and the ability of the government to protect them through regulation (Fotopoulos & Krystallis, 2003:1351; Porter, 2005:14, 19, 20).

In the category of educational risk the concepts of lack of information, block information and uniformed consumers emerged (statements 6.18.9-6.18.11). Kidd (2000:55) indicated that consumers were concerned about the lack of information (statement 6.18.9) about food additives, but they did not see it as a risk. In Table 6.1 (unfamiliar concept), Table 6.4 (unsure concept), Table 6.3 (limited knowledge concept), Table 6.9 (lack of knowledge concept), Table 6.13 and (uninformed concept) Table 6.14 (uniformed concept) the concepts in general indicate that some participants are unknowledgeable about food additives. Nevertheless, the risk communication theory indicates that when consumer concerns are acknowledged and information is provided on how the risks are being addressed, the "outrage" component of risk is reduced (Bruhn, 2005:487).

The category of lifestyle risk and in particular the concept of time constraints (statement 6.18.12) can be compared with the time constraints discussed before (Tables 6.9, Table 6.10 and Table 6.15). Time is one of the most important influences affecting food choices (Freeland-Graves & Nitzke, 2002:103). In general the risk perception of a consumer may create an awareness which can stimulate a further information search (Sheth & Mittal, 2004:365). The more risky something is perceived to be, the harder it is for the consumer to see any benefits, suggesting that just providing more benefits and information may not be effective in changing consumer purchasing behaviour.

Food choice is often influenced more by the psychological interpretation of product attributes than the physical attributes of the product itself. Perception of food safety risks is one example of such a psychological interpretation which influences the behaviour of consumers with regard to the purchase of food products (Yeung & Morris, 2001:170). It is also important for the food industry to understand how and why consumers perceive food additives as risky, since there is a negative correlation between perception of food additive risks and purchasing likelihood (Yeung & Morris, 2001:182).

6.3.3.6 The influence of risk perception on participants' purchasing behaviour

Question 6: How do food additive risks influence your purchasing decision?

The objective of this question (Annexure I, Question 6) was to determine how the reception of food additive risk information influences the purchasing behaviour of consumers. One **theme,** namely the **influence of additive risk perception on purchasing behaviour** emerged (Table 6.19).

As mentioned a negative correlation is found between perception of food additive risks and purchasing likelihood (Yeung and Morris, 2001:182). Consumers tend to adopt one of four broad actions to reduce the risk in a purchase, namely to:

- stop, permanently or temporarily, the purchase of the offending product (Roselius, 1971:57) such as adopting a additive free diet;
- reduce the purchase of the offending product and thereby reduce the exposure to the perceived risks (Roselius, 1971:57), such as drinking less additive containing fruit juices;
- shift from one product to another similar type of product with less perceived risk, such as switching from soft drinks to fruit juice; and
- continue to purchase and absorb the unresolved risk, indicating that the perceived risk associated with a particular product is tolerable and no greater than alternatives (Roselius, 1971:58).

With question six it was attempted to determine what risk management strategies consumers use and how it influences purchasing behaviour. Three categories emerged from the theme. These included will not purchase, will purchase and selective purchasing (Table 6.19). The category "will not purchase" depended on the concepts of specific health risks (statements 6.19.1-6.19.2), children's health (statements 6.19.3-6.19.5), additive shopper experience (statement 6.19.6), product quality (statements 6.19.7-16.19.10) and uncertainty about product content (statement 6.19.11).

Table 6.19 Theme: Influence of additive risk perception on purchasing behaviour

Category	Concept	Sub concept	Participants' statements
Will not purchase	Specific health risk		6.19.1. If allergic, do not buy. 6.19.2. ... also have asthma and eczema, also allergic to eggs. Almost everything contains eggs ... know by now what to buy and I stick to it.
	Children's health	Age	6.19.3. If I have little children will be more conscious ....
		Specific health conditions	6.19.4. Children also suffer from asthma and eczema, [they are] also allergic to eggs and almost everything contains eggs. Read every label.
		Tested as safe	6.19.5 Buy one the children can use, that has been tested.
	Additive shopper experience		6.19.6. Never buy that loaf that got it [food additive] on again ...
	Product quality	Product appearance	6.19.7. Tomato sauce – if it looks inferior you won't buy it.
		Product taste	6.19.8. Yes, taste [a] big factor...
		Additives present	6.19.9. You must just look at everything on the label. I definitely don't buy anything that contains additives. 6.19.10. ... especially when I buy yoghurt. I look for aspartame.
	Uncertain about product content		6.19.11. Rather leave it if I don't know [what it contains].
Will purchase	Product marketing		6.19.12. Presentation, the way they market the product is 99% of selling, and good label then you buy it, doesn't matter what it contain, you buy.
	Tested product		6.19.13. Buy one ... that has been tested. 6.19.14. Buy a different brand, but it has also been tested.
	Habitual purchasing		6.19.15. No, it is a habit, and you buy it every month. 6.19.16. Now I know what to buy and I stick to it...
Selective purchasing	Information search	Label reading	6.19.17. You will first read the label carefully and then decide. 6.19.18. I read labels. This influences my decision to buy.

Table 6.19 (continued) **Theme: Influence of additive risk perception on purchasing behaviour**

Category	Concept	Sub concept	Participants' statements
	Personal preference	Possible dangers	6.19.19. But [I] now give more and more attention. I look at harmful things in products and buy products that work for me.
		Additive presence	26.19.20. Yes, additives influence my decision to buy. I have scaled down altogether on using chips and other stuff... 6.19.21. ... but prefer to cut it out ...
	Value for money	Product quality	6.19.22. I look at them [food additives], but it is a matter of what one can afford. The better product is much more expensive.

The study of Prättälä *et al.* (1985:242) and Worsley (1996:73) confirms this when indicating that shoppers consider additives only in certain specific purchasing situations, for example, when purchasing children's food. According to some authors (Grewal *et al.*, 1994:149; Mitchell, 1999:194), the concept of risk is important for understanding how consumers make food additive choices (Aqueveque, 2006:237), influencing not only decision-making, but also information search (Conchar *et al.*, 2004:430). Shoppers indicated their desire to reduce the risk of developing health conditions had much influence on their food-purchasing decisions (FMI, 2006a:34) and, therefore, on their consequent purchasing behaviour.

As shown in Table 6.19, statement 6.19.12 indicated that participants have the perception that product appearance and a good label influences them to purchase and not necessarily the ingredient content of the product. This may be an indication that the participants use limited decision-making or problem-solving (Schiffman & Kanuk, 2004:549) where only a few product attributes are considered before purchasing (Hawkins *et al.*, 2004:503). Participants further perceived tested products as safe to purchase. This may also be an indication that they trust products that indicate that they are tested. Hawkins *et al.* (2004:501) and Solomon (2004:295) described habitual decision-making to occur when there is very low involvement with the purchase. In addition, these consumers have low levels of motivation to pay attention to information (Balasubramanian & Cole, 2002:113) about food additives.

The concepts of information search, personal preference and value for money describe the category of selective purchasing. Only in two instances did the participants indicate that they will read a product label before deciding to purchase a product (statements 6.19.17 & 6.19.18). This corresponds with the findings of Prättälä *et al.* (1985:239) where only one participant spontaneously checked the additive content on the label. This can be an indication that an information search may lead to selective purchasing.

With regard to the concept of personal preference, the sub-concepts of possible dangers (statements 6.19.19) and the presence of additives (statements 6.19.20 & 6.19.21) indicated that participants are selective in their purchasing choices and were on the lookout for these product attributes. Finally, the concept of value for money emerged from the sub-concept product quality (statement 6.19.22), indicating that participants regarded value for money as an important concept in selective purchasing decisions.

6.3.3.7 Participants' perceptions about the safety of food additives

Question 7: What do you think of the safety of food additives used in food?

Only one **theme, participants' perception about food additive safety**, emerged from this question (Table 6.20). The objective (Annexure I, Question 7) was to determine the consumers' awareness of additives and indicate the reasons for their purchasing behaviour. In a typical food consumer's decision-making process, safety is usually a non-negotiable product attribute. Under normal conditions the majority of consumers are not worried about food safety, but the occurrence of a food safety incident may result in consumer concern and anxiety (Verbeke *et al.*, 2007:2). Participants indicated that they think that additives are either unsafe for health, they are uncertain about its safety or that it is safe for health (Table 6.20). Specific additives which the consumers regarded as unsafe (statements 6.20.1-6.20.2) were tartrazine and red flavourant (Sudan Red). The quantity of additives that a person consumes was also regarded as unsafe for health (statements 6.20.4-6.20.6).

Table 6.20 Theme: Participants' perception about food additive safety

Category	Concept	Sub concept	Participants' statements
Unsafe for health	Specific food additives	Tartrazine concern	6.20.1. … there are things such as tartrazine that worry me.
		Red flavourant concern	6.20.2. That red flavouring that they have removed from the shelves – so there are things that are not good for us.
	No purpose		6.20.3. Not safe …I don't think food additives have any use.
	Intake quantity		6.20.4. Mass quantities can do harm. 6.20.5. It depends on the quantities that one ingests. 6.20.6. They can drink tons of that stuff and it is actually a drink made from synthetic rubbish. That cold drink contains nothing that is good. Everything that is in it is synthetic. It contains no natural ingredients.
Uncertain about safety	Product content	Uncertain consequences	6.20.7. We don't know what the effect is of all the different things that have been added.
	Health risk	Uncertain causes	6.20.8. Got tumours and all kinds of things and we don't know what caused the illnesses. 6.20.9. But still, we possibly ate those things for many years and got cancer.
		Long-term effect	6.20.10. Could be safe for the present, but is there enough research been done to determine the long-term effect and enough time to determine it? 6.20.11. Then the other thing that worries me is that it contains so many things in combination. The long-term effect of the combination of additives – is that ever determined?
Safe for health	Specific food additive quantity in product	Vitamin C positive additive	6.20.12. Some of it is safe, like ascorbic acid or vitamin C. I don't have a problem with that... 6.20.13. Some substances are in such small amounts that they won't do you any harm.
	Governing body	Uncertainty about control	6.20.14. I feel that it would probably be safe to some degree, because there is a board that prescribes which by-products and the highest limit [allowed]. I don't know if there's anyone who ever checks to see if it is being exceeded.

The sub-concepts of uncertain consequences of additive use, uncertain causes of additives and the long-term effect revealed that participants were uncertain about the safety of additives (statements 6.20.8-6.20.11). On the other hand, some participants indicated that additives were safe for health (statements 6.20.12-6.20.14). This category was supported by the concept of vitamin C as a positive additive (statement 6.20.14). Vitamin C is regarded having a positive nutrition characteristic (McNutt *et al.,* 1986:74). The safety perceptions about food additives influence the amount of information search.

According to Bruhn (1998:132) an interesting shift has occurred in consumer perception of responsibility for safe food. A food marketing survey of 1986 in the USA which asked consumers on whom they rely to ensure that the products they buy in the supermarket are safe. Most (48%) of the consumers responded that you have to rely on "yourself" as an individual to ensure that the food you buy is safe (Abt Associates, 1996:5). The government of USA received the second most frequent response with 33% (statement 6.20.14). In addition, Bruhn (1998:132) indicated that an increasing number of consumers look at manufacturers and food processors to ensure that the foods they produce are safe for the consumers' health.

6.3.3.8 Participants' perceptions about food additive legislation in South Africa

Question 8: Please tell us what you know about the legislation/laws in South Africa regarding food additives.

The **theme** emerging from this question was **consumers' knowledge about food additive legislation.** The purpose of this question (Annexure I, Question, 8) was to determine the exposure of consumers to food additive information via regulations in SA (§ 6.1). As mentioned before (§ 2.12), the overall responsibility for food safety and food standards matters currently rests with the DOH (Drew, 1999:164; Neall, 2002a:27). Branen and Haggerty (2002:9) argue that the existing laws in most countries appear to reflect consumer concerns and provide adequate protection including SA (Van de Venter, 1997:5). As shown in Table 6.21 some participants either did not know or were uncertain about food additive legislation (statements 6.21.1-6.12.19) (Porter, 2005:4). This might be an indication that

consumers were not appropriately exposed to legislation in SA. On the other hand, there were participants who were certain about legislation (statements 6.21.20-6.21.22). More specifically, participants were seeking improved legislation with more effective control (statements 6.21.25-6.21.30). Similar to findings by Drew (1999:168), the participants in the present study would like to see more control on how food is produced and manufactured. McNutt *et al.* (1986:75) also found in their study that consumers think that the government is not strict enough about the enforcement and the regulation thereof and the testing of safety of ingredients (Kajanne & Pirttilä-Backman, 1996:219).

Table 6.21 Theme: Participants' knowledge about food additive legislation

Category	Concept	Sub concept	Participants' statements
No legislation			6.21.1. No rules 6.21.2. Zero/nothing.
Uncertain about legislation	Unaware		6.21.3. Is there a law? Nobody does something about it. 6.21.4. Don't know about legislation and codes... 6.21.5. Know nothing. 6.21.6. I don't know what the actual law is, if there is any law, I want to know exactly what the law is.
		Concern about legislation	6.21.7. Don't know what the law is. Serious Concern.
		Lack of information	6.21.8. We are not kept informed of what's going on...
	Uncertain about governing body	Government controlled	6.21.9. Probably the government, I don't know. I just accept it that way. One is just in this general society of 'a thing that I can't change'.
	Quality control	Controlling bodies	6.21.10. I think that to some extent the South African consumers' council keeps an eye on the products that are sold and the substances that are added. 6.21.11. I know there must be a board – like years ago when there was a potato board and so on – that thinks and speaks for us and on our behalf. No, I don't really have any knowledge of it. 6.21.12. Probably the health department. 6.21.13. Few regulations, no bodies that control it.

Table 6.21 (continued) **Theme: Participants' knowledge about food additive legislation**

Category	Concept	Sub concept	Participants' statements
	Apathetic view		6.21.14. I've never read the law.
	Possible action		6.21.15. There probably should be, like the risks we've talked about, that the colourant was taken off the shelves.
	Deceit	Producer protection	6.21.16. It creates the impression that the producer will check on your behalf.
		Product replacement	6.21.17. They just bring that same substance back under a different name.
		Information omission	6.21.18. I don't know if they put everything on [the label] that they should.
	Act on consumer complaints		6.21.19. I don't know if they do it that strictly, it's more about when people start to complain.
Legislation certainty			6.21.20. There is definitely legislation
	Improve legislation		6.21.21. [I] know there is, and they're trying to improve it.
	Quality control	Controling bodies	6.21.22. ...I know if it has the stamp, it's good; then I can eat it. SABS stamp. 6.21.23. Yes, and each has different sections which, for instance, deal with dairy. 6.21.24. Has an SABS stamp, that's about it.
Seek improved legislation	More effective control	Uncertain about controlling body	6.21.25. Would be glad if they could have more control. So that whatever is on the tin is actually in the tin. If there was, who would enforce it? 6.21.26. Would be happy if more control was possible. Buy and trust that it's the truth. We have the right to know. 6.21.27. ...but how effectively it's implemented, that's quite a different situation, and I find it worrying.
		Standarised labels	6.21.28. Standardise the label – so that one knows immediately and can see more quickly whether the product is appropriate.
		Product information	6.21.29. I'd like it if they made the ingredients list clearer.
		Language requirement	6.21.30. It was written in Spanish, Italian or Chinese, [so] I couldn't read it... You don't understand what it says...

The concepts of standardised labels (statement 6.21.28), product information (statement 6.12.29) and language requirements (statement 6.21.30) can be seen as blocking mechanisms influencing participants' food choice. One consumer realised the lack of standardization (statement 6.21.28) of content labelling within the SA Regulation Relating to the Labelling and Advertising of Foodstuffs (SA, 2007:61). This is a true concern since manufacturers can list additives by type and chemical name or E-number or both in the ingredient list.

6.3.3.9 Participants' perceptions of information sources

Question 9: Where do you get your information about food additives?

Consumers' appetite for food news seems to be nearly insatiable (Reinhardt, 2004:128). At the same time, consumer confusion is rampant in the fast-paced, multi-media environment (Hollingsworth, 2003:20; Reinhardt, 2004:128). The objective of this question (Annexure I, Question 9) was to determine the sources (§ 3.3.1.3) which expose the consumer to food additive information (§ 6.1). Six themes emerged from this question, namely:

- information sources about additives on an impersonal level (Table 6.22, § 6.3.3.9.1);
- information sources about food additives on a personal level (Table 6.23, § 6.3.3.9.2);
- trustworthiness of food additive information sources (Table 6.24, § 6.3.3.9.3);
- role of food additive information sources (Table 6.25, § 6.3.3.9.4);
- quality of food additive information sources (Table 6.26, § 6.3.3.9.5); and
- participants' integration of additive information in practice (Table 6.27, § 6.3.3.9.6).

6.3.3.9.1 Theme 1: Information sources about additives on an impersonal level

As shown in Table 6.22 the category of impersonal (§ Table 3.2) media sources identified by the participants, includes the concept of popular information sources (statements 6.22.1-6.22.23). The most important media sources mentioned by the participants were news bulletins, newspapers, electronic media, radio, television, magazines, bookshops, brochures and pamphlets.

Table 6.22 Theme 1: Information sources about additives on an impersonal level

Category	Concept	Sub concept	Participants' statements
Media sources	Popular information sources	News bulletins	6.22.1. News flashes… 6.22.2. News bulletins.
		Newspapers	6.22.3. Newspapers.
		Electronic media	6.22.4. Internet "freak". 6.22.5. Internet source from Mary-Ann, monthly. 6.22.6. Also a nice, new site from Dr. McOlan. 6.22.7. And e-mails. We forward them to each other. 6.22.8. Health 24-website. 6.22.9. Will also do research about additives on the Internet, only if it's bothering me. 6.22.10. Then on e-mails that people send me.
		Radio	6.22.11. Radio …
		Television	6.22.12. Find programmes on TV. 6.22.13. TV advertisements...
		Magazines	6.22.14. Magazines …Publications. 6.22.15. Read many magazines like *Baba en Kleuter* and *Shape*. 6.22.16. … do extra research in health magazines like *Your Family*. Learn a lot from magazines, must have extra knowledge in my field.... 6.22.17. *Huisgenoot* articles... 6.22.18. I don't read a lot, bits in *You*... most of my information. 6.22.19. ... *Vroue Keur* perhaps, magazines.
		Brochures and pamphlets	6.22.20. Brochures like for diabetes and the Heart Foundation. 6.22.21. …or when you get pamphlets. 6.22.22. Health publications...
		Bookshop	6.22.23. …bookshops.
Academic sources	Literature sources	Books	6.22.24. Books, lots of reading, … 6.22.25. …books for raising children. 6.22.26. Many books with research....
		Journals	6.22.27. …research publications...
	Educational sources	Short courses	6.22.28. … do course in natural nutrition.
		School subjects	6.22.29. School, …
		Educational visits	6.22.30. School children who visit factories and then discuss it.

In the category of academic sources (statements 6.22.24-6.22.30) the participants mentioned the concepts of literature sources which included books and journals as well as educational sources which included short courses, school subjects and educational visits. The various communication media play a major role in food information dissemination in modern consumer societies (§ 2.15 & 3.3.1.3). They are part of informal education and both reflect and influence consumer behaviour. In other words, media coverage appears to have a profound effect on food purchaser's opinions and choices (Tansey & Worsley, 1995:182).

6.3.3.9.2 Theme 2: Information sources about food additives on a personal level

The information sources about food additives on a personal level (Table 6.23) were categorised by the researcher as personal communication sources. Four concepts were identified and included social communication sources, health professionals, health organisations and participants' own experience. Personal information (Table 3.2) sources were listed by Assael (1995:230), Hoyer and MacInnis (2001:210-211), Sheth and Mittal (2004:284) and Cant *et al.* (2006:198). These authors divided personal sources into marketer controlled and non marketer controlled sources. Contrary to these authors, the participants in the present study did not mention salespeople, telemarketing or trade shows as information (non-marketer) sources about food additives. Salespeople could be an effortless source of information to consumers (§ 3.3.1.3 & Table 3.3) (Hawkins *et al.*, 2004:531).

Some participants indicated that their doctor is a source of food additive information (statements 6.23.8-6.23.9) although Hollingsworth (2003:20) indicated that American consumers no longer trust their doctor implicitly because more information is available to them and they have better access to such information. Health professionals are the most trusted sources in the USA and Japan. In the UK, however, the consumers express the greatest trust for current affairs such as television programmes (Frewer & Shepherd, 1994:393). Word-of-mouth from family and friends seemed to be another important information source to the participants (statements 6.23.1-6.23.6). Assael (1995:230) as well as some participants in this study indicated that experiences from previous consumption or prior experience (statements 6.23.18-6.23.19) is also a source of information.

Themes three to six as presented in Tables 6.24 to 6.27 were given spontaneously by the participants when question nine (§ 6.3.3.9) was asked. The answers provided by the participants do not specifically answer the question, but important information about the perceptions, opinions and use of the different information sources was revealed. This was an unexpected finding.

Table 6.23 Theme 2: Information sources about food additives on a personal level

Category	Concept	Sub concept	Participants' statements
Personal communication sources	Social communication sources	Other people and friends	6.23.1. … and talk to other people. 6.23.2. Friend takes sweeteners… 6.23.3. From chats with other people. Also hear about children with the same problems; also pick that up. 6.23.4. Discussions with other people. Involved with many people… 6.23.5. Friends…
		Family	6.23.6. From my daughter-in-law…
		Women's groups	6.23.7. Son who is hyperactive, thus [I am] attending meetings with women's groups.
	Health Professionals	Doctor	6.23.8. Also from conversations and from doctor… 6.23.9. Often in the doctor's surgery.
		Homeopaths	6.23.10. And homeopath gives a lot of information. 6.23.11. Also from discussions with homeopath.
		Dietitian	6.23.12. A few dieticians who have made a name for themselves, mainly Mary-Ann Schroeder, in SA in Stellenbosch.
		Elektropuncturist	6.23.13. Elektropuncturist.
	Health organisations		6.23.14. Weigh-Less. 6.23.15. Sureslim. 6.23.16. Heart foundation. 6.23.17. Booklet from ADHASA and ADH logo.
	Own experience		6.23.18. Then 'trial and error'. 6.23.19. Children and tartrazine, also learnt about colourants more quickly. Son has attention deficit disorder, [so I] can't give him any thing.

6.3.3.9.3 Theme 3: Trustworthiness of food additive information sources

As shown in Table 6.24, three categories emerged under the theme of trustworthiness of food additive information, namely information was regarded as trustworthy when the information is endorsed by health organisations (statements 6.241-6.24.2), when similar information was repeated (statement 6.24.3) and when information was presented by well-known professionals (statement 6.24.4). In support of statement 6.24.1, the NCC (2003:6) and Paterson *et al.* (2003:17) indicated that consumers have respect for long-established, well-known endorsements. Trust in the information sources and the message content influences consumer's behaviour. Trusted sources are described as knowledgeable, concerned with public welfare, trustful and have a good tract record (Frewer *et al.*, 1996:478).

Table 6.24 Theme 3: Trustworthiness of food additive information sources

Category	Concept	Sub concept	Participants' statements
Trustworthy	Initiatives by food companies	Endorsements by health organizations	6.24.1. Wimpy's children's menu's tomato sauce doesn't contain so many colourants any more, with the AHD logo. 6.24.2. Try to make it healthier for children. I think it's a good idea.
	Repetition of similar information		6.24.3. If things are said over and over, then you realise there is truth to it.
	Well-known professionals		6.24.4. ...dieticians who have made a name for themselves ...
Untrustworthy	Financial benefit	Food manufacturers	6.24.5. I don't know, some are only out to make money, so they'll say something, and they know everyone's going to believe them.
		Publisher	6.24.6. Sometimes I think everything's a money-making scheme. Sometimes *Huisgenoot* puts something in just to fill up the page and to be interesting for housewives, and to get them talking.
		Increased sales	6.24.7. Companies use a sales gimmick...

Table 6.24 (continued) **Theme 3: Trustworthiness of food additive information sources**

Category	Concept	Sub concept	Participants' statements
	Doubtful information		6.24.8. ...read some but don't believe. 6.24.9. Homeopath says if you see 'no added sugar' and 'Heart Foundation' you should already see red flags, because of what is in it. 6.24.10. If I'm unsure about something, I'll get different opinions.
Uncertain	Researched information	Confusing information	6.24.11. I don't know. ...You have to use your own discretion. The information which is put in there is reasonably well researched and they'll have an expert to do that health page. They also use information from research which is available. Researchers. I think it's relatively safe to say there is a certain degree of truth in it, in that information. 6.24.12. Earlier studies and studies done now contrast with each other. 6.24.13. ...confuses you.
	Product safety		6.24.14. If we can trust them to make it safe it will be easier.

Information is regarded untrustworthy (statements 6.24.5-6.24.10) in the present study when participants perceived the information as being of financial benefit to the manufacturers and publishers. For example, the NCC (2003:2) argues that food assurance schemes are most often used as a marketing tool rather than a way of informing consumers and offering real choice. A lack of trust has been identified as an essential block to good risk communication (Covello 1995:78, Frewer *et al.*, 1996:478; Macfarelane, 2002:74). Given that risks are more acceptable if the source of information is perceived as trustworthy and credible, reassurances of safety from those with self-interest in certain technologies are viewed with suspicion (Macfarlane, 2002:70). In addition, some participants were uncertain that the information is well researched (statements 6.24.11-6.24.13). Similar to the findings about well researched information, McNutt *et al.* (1986:75) indicated that consumers have a lack of confidence in research.

6.3.3.9.4 Theme 4: Role (persuasiveness) of food additive information sources

Food additive information can create awareness about food additives. This awareness can persuade a consumer through the media not to purchase a product (statements 6.25.1-2.25.2). In addition, it can inform the participant to avoid the product and not to gamble with their health (statements 6.25.3-6.25.6). In a study by Wandel (1997:218), 30% of the participants thought that avoiding food additives is important in order to have a healthy diet. Food additive information can stimulate a more intense information search. More information about food additives can be obtained through reading and paying attention to such information (statements 6.25.7-6.25.13).

Table 6.25 Theme 4: Role of food additive information sources

Category	Concept	Sub concept	Participants' statements
Create an awareness about food additives	Do not buy product	Media influence	6.25.1. News flashes, don't buy product. Sudan Red- bad for health, don't buy! 6.25.2. Radio, magazines, don't buy this or this product. Cause hyperactivity.
	Avoid product	Do not gamble	6.25.3. Read about problem, then avoid. 6.25.4. I would take it seriously. I'm not going to experiment and say, 'Let's see if I eat this much whether something's going to happen.' No, I take it seriously. I'd rather go without it than take a chance. 6.25.5. Become confused – rather don't use it then I know I'm not getting it into my body. 6.25.6. Sometimes scared to go into this thing of good stuff and bad stuff, won't find food to buy at all.
Stimulate more information search	Reading		6.25.7. Read everything I can get my hands on. 6.25.8. And if there is something I can use, then I'll definitely read it. 6.25.9. Read a lot...
	Be on the lookout	(Pay attention)	6.25.10. Look carefully at these things when I hear something. 6.25.11. ... then we start checking and is alert. 6.25.12. Be careful of all the stuff. 6.25.13. ...search everywhere.

6.3.3.9.5 Theme 5: Quality of food additive information sources

The category of quality of food additive information sources included the concepts of information overload. Information overload, meaning to overload the senses of consumers (Assael, 1995:231; Hoyer & MacInnis, 2001:211), is an important barrier or blocking mechanism (Hollingsworth, 2000:55) (§ 2.15) in information processing (statements 6.26.2-6.26.4). As a consequence, consumers tended to see only what was relevant, meaningful and personally valued. This resulted in the erection of filters to block out most of the information that was not specifically relevant to them (NCC, 2003:3). In addition, information overload is consumer confusion, resulting in poor purchasing decisions (Schiffman & Kanuk, 2004:229) (§ 3.3.1.4). Similar to the finding in the present study, Sunley (2007:12) argues that SA consumers are indeed overloaded with information (statements 6.26.2-6.26.4).

Contradictory to the findings of the present study about information overload, there is evidence that consumers want to know more about food additives and that labels should carry more information (MAFF, 1986:24; Drew & Lyons, 1987:12; Wandel, 1997:218; Bruhn, 2002:103). Przyrembel (2004:363) explained that from the side of informed consumers, more information on the composition of a food is welcome. However, there is a possibility that food labels will become unreadable for the average consumer.

Table 6.26 Theme 5: Quality of food additive information sources

Category	Concept	Sub concept	Participants' statements
Quality of information	Magazines	Vague information	6.26.1. ...but I'm not completely satisfied with what we get in the magazines, because it comes across very vaguely. I'm probably very critical, because I inspect it very carefully.
	Information overload		6.26.2. Too much information. 6.26.3. Too many things... 6.26.4. Because it sounds good. That's why when I read something, I think 'maybe', and it goes in and out. My whole life doesn't revolve around that little thing.
	Internet	Trustworthy	6.26.5. Best place is the Internet.

6.3.3.9.6 Theme 6: Participants' integration of food additive information in practice

As shown in Table 6.27, participants indicated that the application of food additive information was the participants' own responsibility and it should be based on one's own experience (statements 6.27.1-6.27.4). Participants further indicated two reasons for searching for information about food additives. The first was based on additive alerts (statements 6.27.5-6.27.10) and the second was to obtain information by searching for alternative sources of information (statement 6.27.11) and to control the quality of information already obtained.

Table 6.27 Theme 6: Participants' integration of food additive information in practice

Category	Concept	Sub concept	Participants' statements
Application of information	Own responsibility		6.27.1. You must decide what works for you. Your feeling. 6.27.2. One has to look and use one's own discretion. 6.27.3. Depends on the person and the family.
	Own experience		6.27.4. Then trial and error.
Reasons for information search	Food additive alert	Media	6.27.5. Will do research on the Internet about additives, only if it's bothering me. 6.27.6. Radio, magazines, do not buy this product. Cause hyperactivity. Read about problem ....
		Health concern	6.27.7. Sudan Red- bad for health, don't buy, then we start checking .... 6.27.8. Have a son who is hyperactive. [I] attend meetings with women's groups. 6.27.9. Allergic child, verify information on Internet.
		Self-enrichment	6.27.10. If I'm wondering about something, I'll get different opinions.
	Alternative information search	Second opinion	6.27.11. Tartrazine is one product I look at and I prefer to check which one's sugar content is the lowest.

Participants indicated that they are alerted about food additives through various media sources (statement 6.27.6) as well as their health concerns (statements 6.27.7-6.27.9). Food additive alerts serves as a stimuli for consumers to recognise a problem. The higher the risk that

consumers' perceive about the ingredient, the more the extent of information search that will take place. (Hanna & Wozniak, 2001:291; Hawkins, *et al.*, 2004:529; Schiffman & Kanuk, 2004:549; Sheth & Mittal, 2004:286; Solomon, 2004:295; Peter & Olson, 2008:179). An information search is a thus a risk reduction strategy that consumers utilize (Schiffman & Kanuk, 2004:198) before making a purchase (Assael, 1995:236).

6.3.3.10 Influence of information sources on purchasing behaviour

Question 10 Does the food additive information help you in your purchasing decision?

One **theme** emerged from this question, namely the **influence of food additive information on purchasing decision** of the participants. Question 10 (Annexure I) was asked in order to determine to what extent food additive information influences consumers' purchasing behaviour. According to the results (Table 6.28), food additive information has three distinct influences on the participants' purchase decisions, namely assistance in purchase decision, occasionally assisting in purchase decision and no assistance in purchase decision. Food additive information on labels does assist in some participants' purchasing decisions (statements 6.28.1-6.28.5). Similarly, Synovate (2005:20) indicated that apart from brand information, ingredient information was most important to consumers when making purchasing decisions. Furthermore, other participants in the present study indicated that food additive information only occasionally assists in the purchasing decision (statements 6.28.6-6.28.7).

Unfortunately, food additive information provides no assistance in the purchasing decisions of some participants (statements 6.28.8-6.28.14). Three sub concepts indicated why food additive label information was not assisting participants, namely food additive label information was a time-consuming type of information to search (§ 6.3.3.1.3, Table 6.9, statement 6.9.12 & § 6.3.3.2, Table 6.15, statements 6.15.8-6.15.9), not trustworthy (§ 6.3.3.3.1, Table 6.14, statements 6.14.24-6.14.29 & § 6.3.3.3.9, Table 6.24, statement 6.24.5-6.24-10) and label legibility was a problem (§ 6.3.3.10, Table 6.29, statement 6.29.4-6.29.6).

Table 6.28 Theme: Influence of food additive information on purchasing decision

Category	Concept	Sub concept	Participants' statements
Assistance in purchasing decision (Yes)	Stimulate thinking process		6.28.1. Absolutely, I think about it.
	Product information	Ingredients list on labels	6.28.2. Tartrazine is one product I look at and I prefer to check which one's sugar content is the lowest. 6.28.3. I picked up each tin and put it down again because I couldn't buy it, because it contained grains, sugar, milk. It was incredibly difficult.
	Type of media sources	Magazines	6.28.4. ...definitely influenced... magazines.
		Internet	6.28.5. Internet, definitely influenced... others say so, so Internet is the best.
Occasionally assist in purchasing decision	Inadequate	Ingredient information	6.28.6. Yes, not always.
		E-numbers	6.28.7. Help me but don't know E-numbers.
No assistance in purchasing decision (No)	Product labels	Time-consuming type of information	6.28.8. Terrible, take you long to do shopping especially a new product, go through list and see some. Sometime I wish I was not like this, it make my life very difficult. It must be awful for mothers with little children to study all different things.
		Legibility	6.28.9. No, not marked very well.
		Not trustworthy	6.28.10. Normal buying, for example, there is caffeine in certain products and on the pack it says caffeine free.
	Own discretion on products		6.28.11. If you can't eat something, you don't eat it. 6.28.12. ....what is bad for a person? Each person has to desice for himself.
	Products you know cause no health risk		6.28.13. Not bad, and doesn't do anything to me, then I'll buy it.
	Unconcerned about food additives		6.28.14. Regardless of whether there is a bunch of colour additives, you still choose it.

With regard to label legibility and time-consuming information (statement 6.28.9), Paterson *et al.* (2003:1) argues that food labels should be easy to interpret and must deliver information that is easy to understand and use, thereby enabling consumers to make informed choices about the foods they purchase. As mentioned before, time is a situational factor that can manifest itself in a number of ways. The amount of time available for the purchase has a substantial impact on the consumer decision process (Hawkins *et al.*, 2004:488). Other reasons why participants do not utilize additive information in their purchasing decisions was indicated in statements 6.28.11-6.28.14. Participants indicated that they use their own discretion when selecting foods containing additives. Moreover, information does not assist if products pose no risk to health or when participants are unconcerned about food additives.

6.3.3.11 Participants' perceptions about food additive labelling

Question 11 Does the label provide you with the information on additives you are searching for? What information are you looking for on labels in terms of food additives?

The objective of this question was to determine how the reception of additive information influenced the purchasing behaviour of consumers by exploring food additive labels. Three themes emerged from question 11 (Annexure I), namely:

- participants' perception of food additive label information (§ 6.3.3.11.1, Table 6.29);
- non-label reading activities of participants (§ 6.3.3.11.2, Table 6.30); and
- type of additive information searched for on labels (§ 6.3.3.11.3, Table 6.31).

6.3.3.11.1 Theme 1: Participant's perception of food additive label information

Three categories (Table 6.29) indicated participants' general perceptions about food additive label information, namely insufficient information, sufficient information and uncertainty about information. With regards to insufficient food additive information presented on labels, some concepts were discussed in previous sections and the researcher referred to them where applicable. In terms of insufficient information, some participants indicated a lack of

standardisation in the terminology used on the label (statements 6.29.1-6.29.3) (§ 6.3.3.8, Table 6.21, statement 6.21.28). On the other hand, legibility on labels (§ 6.3.3.9, Table 6.29, statement 6.28.9) included the letter size and the difficulty participants had to detect specific ingredients they were searching for (statements 6.29.4-6.29.6). Letter sizes are prescribed in the Regulations Relating to the Labelling and Advertising of Foodstuffs (SA, 2007:17) and should be uniform in colour and prominence (Whiteley, 2000:207). Similar to the present study, Humphries (1998:195) and the NCC (2003:13) found that the standard of legibility on labels was a concern for UK consumers as well as for South African consumers (Klein, 2005:73).

Table 6.29 Theme 1: Participants' perception of food additive label information

Category	Concept	Sub concept	Participants' statements
Insufficient information (No)	Lack of standardisation	Terminology used	6.29.1. All manufacturers must use same number or name, my list, good stuff, bad stuff – avoid. Instead of tartrazine they put E102 because lot of people does not know it's tartrazine they think its okay and buy it. More standardised to identify. 6.29.2. Agree, then all consumers can identify ingredients. 6.29.3. Standardisation very important.
	Illegible	Font size	6.29.4. Always too small, easier to list it like the format of nutritive information with E-numbers. 6.29.5. Small and have to look for it. Sweetened is written in large but rest is very small.
		Difficult to detect specific ingredients	6.29.6. Allergic, will see nuts allergic fatal even a trace of that, not listed very well. Red flash light or "small print" [Nuts added]
	Beyond participant's understanding	Unknowledgeable	6.29.7. I don't know much about the other stuff. 6.29.8. Look at everything ... except stuff I don't understand. ... because I'm just an average person. For me, a little number that says it includes colourants gives me absolutely no indication of what it is. 6.29.9. All it contains is stuff you've never dealt with before.

Table 6.29 (continued) **Theme 1: Participants' perception of food additive label information**

Category	Concept	Sub concept	Participants' statements
		Teminology	6.29.10. Says 'no egg', but 'lecithin'. If you didn't know you wouldn't know it contains egg. 6.29.11. Instead of tartrazine they put E102 because lot of people don't know it's tartrazine they think its okay and buy it.
	Inadequate	Illegable	6.29.12. No [don't see the necessary information].
		Ingredient list information	6.29.13. I think the ingredients list is really not adequate. Sometimes I want more information, definitely. 6.29.14. I also think they can add more information, especially for people with allergies and certain illnesses. 6.29.15. Like those little words, like those colourants and the codes of the colourants – I find them completely inadequate...
Sufficient information (Yes)	Understandable		6.29.16. [Ingredient information on labels are…] Straight forward. 6.29.17. Yes, that which I understand is enough.
	Usable		6.29.18. [Buy what you always buy] …except new products, ingredients list. [It] works for me and my family.
	Trustworthiness issue	Complete information source	6.29.19. As long as I can trust that everything that really is in there is on there then yes it helps me. [I] am so scared they are leaving something out.
	Adequate amount of information		6.29.20. Get a lot of information on the label.
	Faith in icon identification	Trust endorsements	6.29.21. I have to tell you: What I enjoy or what puts me at ease is when it shows the Heart Foundation's sign. Then I think it will be safer.
Uncertain	Unintelligible		6.29.22. It is difficult to answer, because you don't really have insight into what is written there.
	Indecisive		6.29.23. I don't really know exactly what I want.

There was an indication that some of the food additive label information was beyond participants' understanding. Participants complained that they were unknowledgeable

(statements 6.29.7-6.29.9) (§ 6.3.3.2.4, Table 6.13, statements 6.13.1-6.13.3; & § 6.3.3.4, Table 6.9; statements 6.9.1-6.9.3) and did not know the meaning of some terminology used on labels (statements 6.29.10-6.29.11). Various authors (Crawford & Baghurst, 1990:231; Worsley, 1994:223; Wandel, 1997:213; Abbott, 1999:47; Tessier *et al.*, 2000:40; FAC, 2001:40; Paterson, 2003:28; ACNielsen, 2005a; Klein, 2005:73) argue that ingredient information on labels is confusing and difficult to understand. This phenomenon indicated a lack in participants' knowledge, with the result that they could not fully utilize the information provided on a product label (Petty &Cacioppo, 1986:8; Engel *et al.*, 1993:407).

The participants argued that food additive label information was inadequate (statement 6.29.13-6.29.14). Various authors (Worsley, 1994:225; Wandel, 1997:214; Crawford & Baghurst, 1990:231; Levy *et al.*, 1991:121; Abbott, 1999:47; Bruhn, 2002:103, NCC, 2003:19; Williams *et al.*, 2004:33) also pointed out that consumers suggested that labels should carry more information. Uncertainty and insufficient information about product contents can be a blocking mechanism in the purchasing decision (Rousseau, 2003a:118). Insufficient food additive label information posed a problem for both participants and manufacturers. Manufacturers need to present the food additive information in such a way that the consumer can understand it, be motivated to apply it and be able to translate it into food choices and ultimately into purchasing behaviour (Michel *et al.*, 1994:147; Tessier *et al.*, 2000:36).

In terms of sufficient information (statements 6.29.16-6.29.21) some participants indicated that the information about additives on labels was understandable, they used it, trusted it and could adequately make informed choices. This is similar to the findings of a South African study investigating general labelling perceptions (Klein, 2005:73). Contrary to this, Paterson (2003:17) and the NCC (2003:17) showed that participants did not trust ingredient list information. One participant indicated that he/she trusted endorsements (statement 6.29.21). This was confirmed by Paterson (2003:17) who found that a high proportion of participants trusted endorsements. At the same time the NCC (2003:6) reported that long-standing endorsements were respected and seen as credible. Furthermore, the NCC (2003:7) argues that trusted endorsements serve as a shortcut for consumers in their decision-making process.

6.3.3.11.2 Theme 2: Non label reading activities of participants

Table 6.30 shows some participant non-label reading activities (statements 6.30.1-6.30.8). From a public policy standpoint, an information search is encouraged to develop more knowledgeable consumers (Peter & Olson, 2008:201). In contrast, many problems are resolved by the consumer using only previously stored information. The consumer purchases a product based on recalled product information and nominal decision-making occurs (Hawkins *et al.*, 2004:529). Non-label reading activities of participants is also called routinised response behaviour (Schiffman & Kanuk, 2004:549), habitual decision-making (Rousseau, 2003a:124; Solomon, 2004:295), impulse purchases (Hanna & Wozniak, 2001:291) or routine problem-solving (Sheth & Mittal, 2004:285). Habitual or positive experiences occurred when consumers bought the same product for years and did not have a problem with it (Paterson, 2003:18).

Table 6.30 Theme 2: Non-label reading activities of participants

Category	Concept	Participants' statements
Habitual product selection	Repeat purchases	6.30.1. Buy what you always buy...
	Buying determination	6.30.2. ... but if I really want it, I'm going to get it.
	Product preference	6.30.3. If you like something, you like it ...
Low participant involvement in product selection	Not perturbed about consequences	6.30.4. I will deal with the consequences. 6.30.5. I'll worry about it later. 6.30.6. ... not worry about it.
	Time-consuming	6.30.7. Time-consuming, buy something, looks good and buy it. 6.30.8. ...that I find it is actually a lot of information to keep you busy.

Paterson's (2003:3) study indicated two reasons for non-use of labels. Participants were either disinterested in labels, because they were in habit of purchasing the particular product or they had previous positive experiences with the particular product, rendering the use of labels unnecessary. Furthermore, ingredient information is used the most when purchasing products for the first time (Crawford & Worsley, 1986:74; Wandel, 1997:213; Marietta *et al.*,

1999:447; Paterson, 2003:16; Sloan, 2003a:31). When deciding whether to buy a food product for the first time, consumers said that they always or almost always look at the type of preservatives or additives (FMI, 2003:21, Klein, 2005:75). Moreover, non-label reading activities may be an indication of low motivated consumers in terms of searching for nutrition information (Balasubramanian & Cole, 2002:121). Consumers with a low-involvement in processing a message tend to choose the peripheral route to persuasion (Antonides & Van Raaij, 1998:208).

6.3.3.11.3 Theme 3: Type of additive information searched on labels

The last theme (Table 6.31) indicated what type of information food additive label reading participants searched for on labels. The types of food additives searched for was presented as concepts in Table 6.31.

The types of additives (statements 6.31.1-6.31.18) used during the focus group discussions corresponds with the types of additives that participants mentioned in the unprompted awareness scenario (§ 6.3.3.1). The only exception was lecithin. Indeed a larger variety of food additives were mentioned in the unprompted awareness question than was mentioned to be used when information on labels was searched. A reason might be that participants experienced some fatigue because of the long duration of the discussion session. This is an interesting finding as unprompted awareness (§ 6.3.1) gives an indication of how well food additive information has been evaluated and integrated in the memory, and how important the consumers perceived that attribute on the label to be (Balasubramanian & Cole, 2002:113).

Moreover, triangulation took place because participants repeated information previously provided thereby indicating consistency in their perceptions. Williams *et al.* (2004:37) and Klein (2005:54) found that some participants read the ingredient list for health reasons, more specifically to avoid additives such as tartrazine and MSG, which colourants they believe to be unhealthy. As mentioned before, the types of additives participants search for is an indication of their awareness of particular food additives.

Table 6.31 Theme 3: Type of additive information searched on labels

Category	Concept	Sub concept	Participants' statements
Type of food additive	Tartrazine/E102		6.31.1. Tartrazine and other junk. Look at the amount... 6.31.2. I only look at tartrazine... 6.31.3. I look for tartrazine.
	Sugar	Health effect	6.31.4. Sugar ..... 6.31.5. Look for sugar... 6.31.6. Sugar – immune system becomes worn down by it and destroys white blood cells. It's very bad for you. 6.31.7. These days I also look at things for diabetes, low sugar… 6.31.8. Lactose intolerant, specifically look for that.
		Refined sugar	6.31.9. Refined sugar – sucrose and fructose – definitely additive.
	Artificial sweetners		6.31.10. ...sweetener – don't like it.
	Aspartaam		6.31.11. I only look at ... aspartame.
	MSG		6.31.12. MSG,
	Caffeine		6.31.13. .... and caffeine.
	Colourants		6.31.14. … I look for red colourants/additives then I'm happy. No colourants added then I'm happy. 6.31.15. In general it [label] gives you the colourants.
	Vitamins		6.31.16. In general it [label] gives you the vitamins …
	Traces of nuts		6.31.17. Allergic, will see nuts allergy fatal …
	Eggs	Lecithin	6.31.18. Doesn't say 'egg', but 'lecithin'. If you don't know, you won't know it contains egg.

6.3.3.12 Participants' perception of ingredient lists on food products

Question 12 What do you think of the ingredient list on food labels?

The objective of this question (Annexure I, Question 12) was to determine how the reception of additive information influences the purchasing behaviour of consumers by exploring the food additive ingredient list on food product labels (§ 6.1). Two categories, one about

negative ingredient list attributes and one about positive ingredient list attributes emerged from the data (Table 6.32). More negative ingredient attributes were listed.

Various concepts re-emerged in follow-up focus groups (statements 6.32.1, 6.32.7-6.32.12) from this question thereby indicating the importance and consistency in the opinions of the participants. The following concepts were already discussed in detail:

- contains inadequate information (§ 6.3.3.9, Table 6.28, statement 6.28.6-6.28.7);
- uncertain about product contents (§ 6.3.3.6 Table 6.19 statement 6.19.11 & § 6.3.3.11.1, Table 6.29, statement 6.29.13-6.29.14);
- uncertain about what is permitted (§ 6.3.3.7, Table 6.20 & § 6.3.3.8, Table 6.21).

Re-emerging concepts (as indicated by participants in different focusgroup sessions) indicate that triangulation was achieved thus indicating the trustworthiness of the data (§ 5.11 Table 5.4). Participants indicated that perceptions were the same irrespective if the questions about food additives were asked in different ways.

Table 6.32 Theme: Participants' perception of the ingredient list

Category	Concept	Sub concept	Participants' statements
Negative ingredient list attributes	Contains inadequate information		6.32.1. Labels and ingredients lists are definitely not adequate.
	Contains basic information	Do not elaborate on information	6.32.2. Only basic information is given and they don't elaborate enough. 6.32.3. If they give you the basic ingredients, and maybe separately from the additives and the stuff and what it means.
		Do not reveal all information	6.32.4. It doesn't really explain everything that is in there. So then you're very unsure, especially people with allergies, I think it [label] is not enough.
	Information not on all products		6.32.5. ...it is only on 1 out of 100 boxes, and many people are extremely allergic.

Table 6.32 (continued) **Theme: Participants' perception of the ingredient list**

Category	Concept	Sub concept	Participants' statements
	Uncertain about product contents	Ingredient list causes of a feeling of deceit	6.32.6. ...but again is that really what was added? I'm not always so sure about that. 6.32.7. Feel angry, trying to fool me, if they say no MSG it's great!! Otherwise great possibility, that product got MSG. 6.32.8. I don't think I really believe them.
	Uncertain about what is permitted		6.32.9. ...permitted in what regard? 6.32.10. What is allowed? 6.32.11. Is it the law that allows them to do that [to say 'Permitted'], or is it the company that allows it? The law isn't quoted anywhere. 6.32.12. And is it safe even if it's permitted? Has it been tested? You don't really know if it's been tested, it's just something they say, to make it sound nicer; Pick 'n Pay committed.
	Curiosity to know what products contain		6.32.13. One really wants to know what is in it. I like to see what it contains.
	No comprehension of ingredients lists and E-numbers	Too scientific	6.32.14. ...but I think when they start with the other names and additives and stuff in between, then you start worrying. 6.32.15. Greek, don't understand... 6.32.16. ... has codes but I don't know them by heart. 6.32.17. Is the code a chemical name for that thing? 6.32.18. Greek. Don't understand scientific terms. For instance they call salt sodium chloride and I just happen to know that's the other name for salt. But what about all the other things we don't know or know about? 6.32.19. Too scientific; we don't know it. 6.32.20. Says on the ingredients list milk solids, milk this and milk that's... different kinds of milk something, [I] don't understand. 6.32.21. I don't know what all those colourants and preservatives are anyway.
		Confusing information	6.32.22. Then you don't really know what's going on there. 6.32.23. ...doesn't make sense.

Table 6.32 (continued) **Theme: Participants' perception of the ingredient list**

Category	Concept	Sub concept	Participants' statements
		Avoid unfamiliar food additives	6.32.24. As soon as I see something funny on a product, E-numbers or a funny word, I leave it and don't want it in my body.
	Worthless information		6.32.25. Doesn't help much. 6.32.26. Others don't help at all.
	Requires disclosure of ingredient list	Financial implication	6.32.27. As much as possible [information] ... it will make the product more expensive.
Positive ingredient list attributes	Product quality verification	Ingredient verification	6.32.28. Husband phone company, if not satisfied, positive respond, they very sorry, major printing error. Send free voucher or replace it. Actually very good. 6.32.29. What I look at and I want to see if it contains orange juice, see if they're telling the truth. Does it really contain orange juice? Let's say, for example, if it's third on the list. 6.32.30. Each preservative and flavourant or something you add as a number like that.
	Health concerns	Ingredient verification	6.32.31. If you really have an allergy, have an effect, yes. 6.32.32. I only want to see gluten. I'm allergic to that ingredient. 6.32.33. Natural additives don't have as much impact or strength as artificial or chemical ones. 6.32.34. They specify for allergies or no allergies.
	Consumer clarity		6.32.35. ...and is immediately clearly understandable and visible. 6.32.36. Agree 100%. It is written in 'human language'. 6.32.37. Some of them help ... 6.32.38. Can't say something's missing.
	Comprehensible standarised labelling information		6.32.39. Maybe if they use the same method as Store X– would appreciate it.

Some new concepts were that the ingredient list on labels contains only the basic information (statements 6.32.2-6.32.4) and that some information did not appear on all products

(statement 6.32.5). This was a further indication that participants are looking for more information on labels and that the current information provided was inadequate (statement 6.32.1).

According to Falk (1994:7), today's consumers are faced with several choices as they are more discerning, better informed and more discriminatory when selecting from the multitude of products available. As a result, consumers are more curious about food additives. This fact was confirmed by participants in the present study (Table 6.32, statement 6.32.13 & Table 6.16, statement 6.16.49) and various other studies (Shine *et al.*, 1997b:293; Wandel, 1997:213; Klein, 2005:52, 55).

Comprehension of the information on the ingredients list and E-numbers (statements 6.32.14-6.32.21) was a problem for some participants in the present study. This was also a re-emerging concept which was worth further discussion. Similar to this study, Paterson, (2003:17) showed that the main reason provided by respondents as to why labelling elements were incomprehensible was the use of scientific language on the ingredient list. Moreover, consumers wanted labels to be bigger and in "plain English" (Shannon, 1994:40; Tessier *et al.*, 2000:38; Klein, 2005:73). Furthermore, Bruhn (2002:103) indicated that almost half of the participants who used food additive labelling found it confusing (statements 6.32.14-6.32.23) or difficult to understand (Worsley, 1994:223; Paterson, 2003:28). As mentioned before consumers in a study by Wandel (1997:216) indicated that the E-numbers should be replaced by chemical names of the food additives used in food products as chemical names were more informative. This replacement, therefore, suggested a conflict between the need for simplification of the concepts in the ingredient list and the need for rather longer and more complicated chemical names of food additives in the ingredient list (Wandel, 1997:216).

The participants' perception of worthless information (statement 6.32.25-6.32.26) indicated that participants could not utilise the information provided to them. A negative aspect that participants indicated was that the requirement of full disclosure of the ingredient list would make products more expensive (statement 6.32.27). The perception that more information would lead to an increase in product prices was a phenomena that can be seen as a possible

blocking mechanisms when consumers purchase food additive containing products (Rousseau, 2003a:117; Cant *et al.*, 2006:196).

The following positive ingredient list attributes were identified by the participants in the present study (Table 6.32):

- product quality verification (statements 6.32.28-6.32.30);
- health concerns are addressed through ingredient verification (statements 6.32.31-6.32.34);
- consumer clarity (statements 6.32.35-6.32.38); and
- comprehensible standardised labelling information (statement 6.32.39).

Participants sometimes perceived the concept of product quality verification (statements 6.32.28-6.32.30) as important when making food choices. With regard to health concerns, participants indicated that they regard ingredient verification as important. Moreover, Shine *et al.* (1997b:293) found that information with regard to artificial (statement 6.32.33) colourants and additives on food labels, together with nutrition information, were given priority by the participants. The authors also observed that consumers often refer to food products or nutrients in general terms such as either "good" or "bad" as found in the present study.

The concept of consumer clarity is evident (statements 6.32.35-6.32.38) as expressed by some participants' perception that the ingredient list on the label was understandable and legible. Finally, one participant (statement 6.32.39) indicated that the labelling scheme of one particular South African retailer (Store X) could serve as example of what consumers expect from a food label. These labels were comprehensible and standardised and fulfilled the needs (Table 6.29, statements 6.29.16-6.29.21) of some participants (Note: Two other participants in focus group 5 agreed unanimously with this statement).

Once again it should be emphasized that a single statement could be the viewpoint of one or more participants except when otherwise stated (§ 6.3.3).

6.3.3.13 Participants' approval of current label dissemination

Question 13 Do you think food manufacturers reveal enough information to the public about substances used in their food? Why, how can they improve upon it?

In question 13 (Annexure I) the researcher attempted to determine how the reception of additive information influenced the purchasing behaviour of consumers by exploring food additive information on food labels. Two themes emerged from question 13, namely:

- participants' satisfaction with manufacturers' dissemination of food additive information (§ 6.3.3.13.1, Table 6.33); and
- participants' dissatisfaction with manufacturers' dissemination of food additive information (§ 6.3.3.13.2, Table 6.34).

6.3.3.13.1 Theme 1: Participants' satisfaction with manufacturers' dissemination of food additive information

Some participants indicated that they found the information about additives on food labels adequate (Table 6.33). Statement 6.33.1 about endorsements has been discussed (§ 6.3.3.11.1, Table 6.29, statement 6.29.21). Furthermore, the disclosure of ingredient information corresponds with the positive ingredient attributes in Table 6.32. A participant indicated that he/she was satisfied with the disclosure of all food additive information, not only on the label, but with other information sources as well (statement 6.33.2). Significant satisfaction with the ingredient list also was an influential factor for about 70% of German consumers to persuade them to buy the food product (Przyrembel, 2004:364).

Table 6.33 Theme 1: Participants' satisfaction with manufacturers' dissemination of food additive information

Category	Concept	Participants' statements
Adequate amount of information	Confident about endorsements	6.33.1. Yes, definitely believe the logo.
	Disclosure of all information	6.33.2. Yes, definitely. [Food manufacturers give enough information about the additives that they use.]

6.3.3.13.2 Theme 2: Participants' dissatisfaction with manufacturers' dissemination of food additive information

As mentioned before, the category of inadequate information provided by manufacturers (statements 6.34.1-6.34.17) was a re-emerging concept (§ 6.3.3.11.1, Table 6.29, statements 6.29.1-6.29.15). Re-emerging of a concept within follow-up focus group sessions might be an indication of the participants' strong perceptions about inadequate information on food labels. As mentioned before, re-emerging concepts indicate that triangulation and trustworthiness (§ 5.11 Table 5.4) was achieved in the present study. In statement 6.34.9 a participant indicated that he/she was unsure about endorsements' trustworthiness, which contradicts previous statements about endorsements (§ 6.3.3.11.1, Table 6.29, statement 6.29.21 & § 6.3.3.13.1, Table 6.33, statement 6.33.1). There were some participants who trusted and some who did not trust endorsements. Thus, trust of endorsements could influence purchasing behaviour positively or negatively depending whether consumers used it as a shortcut in product selection or whether it was a blocking mechanism (Rousseau, 2003a:117; Cant *et al.*, 2006:196).

Table 6.34 Theme 2: Participants' dissatisfaction with manufacturers' dissemination of food additive information

Category	Concept	Sub concept	Participants' statements
Inadequate amount of information	Unbeneficial information		6.34.1. Only on label, doesn't benefit us, not enough information.
	Wider dissemination necessary		6.34.2. No, I don't think so. [Everyone agrees.]
	Unclear information		6.34.3. When advertise .... tell exactly, more specific.
	Limited distribution of information		6.34.4. When advertise, spread out.
	Closure of product information		6.34.5. Why should I give away the recipe of my product, give no ingredient information. How far can you stretch it? [They] are not going to tell you 100%.

Table 6.34 (continued) **Theme 2: Participants' dissatisfaction with manufacturers' dissemination of food additive information**

Category	Concept	Sub concept	Participants' statements
	Disseminate inconsistent risk information		6.34.6. Flora in/out [from margarine], then next week avocados is in then out.
	Undisclosed ingredients	Ingredient verification	6.34.7. No, there can be 15 other things included, that we don't know about. 6.34.8. I think the consumers don't know what is really in the products that they're buying.
	Unsure about endorsements' trustworthiness		6.34.9. Big question regarding certain aspects, for instance Heart Foundation sign pays margarine X to put the sign on [its products]. How much truth is in that?
	Unsure about product information control		6.34.10. Is there someone who tests it? I mean, we eat natural products with no colour or preservatives. Who checks that it is really true? Do we know anything about tins?
	Unsure about product quality	Deceptive product standarisation	6.34.11. When they make stuff, there is a standard for the product, but that doesn't necessarily mean that everything they make adheres to the standard they have set. 6.34.12. They let things slip through which are not up to standard! 6.34.13. How do you know its right?
		Withdrawal of products	6.34.14. They can put anything in there and next week it's off the market, and then you've already eaten three tins of the stuff.
	Unfamiliar information	Unclear terminology	6.34.15. The abbreviations don't help, except if they give you a little list explaining them. Each of us has a booklet before we go in [the shop]. 6.34.16. That little 'E something' won't help at all, we don't know that stuff. 6.34.17. I don't know...

Once again a participant indicated the need for more information (statements 6.34.1-6.34.2) on the label (Levy *et al.*, 1991:121; Worsley, 1994:225; NCC, 2003:19). In addition, some

participants indicated that the information provided was unbeneficial (statement 6.34.1), unclear (statement 6.34.3) and limitedly distributed (statement 6.34.4). The closure of product information (statement 6.34.5), dissemination of inconsistent risk information (statement 6.34.6) and the use of undisclosed ingredients (statement 6.34.7-6.34.8) was also mentioned as reasons why they were dissatisfied with manufacturers' dissemination of food additive information. The concept of unsure about product quality (Porter, 2005:21) included the sub concepts of deceptive product standardisation (statements 6.34.11-6.34.13) and withdrawal of products (statement 6.34.14). Statements 6.34.5-6.34.17 also indicated participants' distrust in the information provided by manufacturers.

The study of Klein (2005:75) showed that participants do not understand the terms and abbreviations on food labels and this was similar to the finding of the present study (statements 6.34.14-6.34.15). Unclear terminology or unfamiliar information point to consumers who do not have the ability to process such information (Petty & Cacioppo, 1986:61; Antonides & Van Raaij, 1998:208; Grunert, 2002:281; Peter & Olson, 2008:119; Updegraff *et al.*, 2007:254). Ability concerns whether a person is familiar with stimuli claims and is capable of comprehending them (Shimp, 1997:156). As mentioned (§4.4.5 & 4.4.7) unknowledgeable consumers may focus on non-claim 'cues' (pictures or packaging) within the message (Engel *et al.*, 1993:407). Thus uninformed consumers are more likely to follow the peripheral route to persuasion (Petty & Cacioppo, 1986:8) (§ 4.4.5.2).

6.3.3.14 Participants' perceptions of a food additive claim

Question 14 What is a food additive claim? Why? Give examples.

The objective of question 14 (Annexure I) was to determine consumers perceptions of food additive claims on product labels (§ 6.1). The three themes were:

- participants' awareness of the term "food additive claim" (§ 6.3.3.14.1, Table 6.35);
- examples of food additive claims as perceived by participants (§ 6.3.3.14.2, Table 6.36); and
- participants' beliefs about food additive claims (§ 6.3.3.14.3, Table 6.37).

Consumer perceptions about food additive claims, benefits and claim types have received only limited academic attention. Most of the literature was devoted to health claims (Ford & Hastak, 1996; PASSCLAIM, 2004; Dragicevich *et al.,* 2006). Consumers' choices of additive free foods depended on how consumers perceive and understand a claim. Consumers may over-rate a product's one positive attribute among all food attributes which was named the "mere-label" effect. For example, a "with added vitamins" claim may be regarded as healthy, although the product might have a high sugar and or fat content, such as some cereals. The claim of a particular ingredient (such as "no preservatives") may lead to a "halo-effect" where consumers generalise this positive perception to other additives' levels not implicit in the claim (such as "additive free") and is named the "over generalization" effect. Finally the "magic bullet" effect is when the consumer's perception about certain attributes provokes inappropriate benefits to the product (Van Trijp & Van der Lans, 2007:307).

Many logos and claims that appear on food fall into the "voluntary labelling" category. This means they are not subjected to specific regulations under the food law. The NCC (2003:5) argues that this fragmented approach could lead to more confusion among consumers. As the food industry is increasingly driven to add value and differentiate their products from the competition, the number of voluntary food labels continues to grow. This proliferation of labels and logos has caused confusion and misinformation among consumers.

6.3.3.14.1 Theme 1: Participants' awareness of the term "Food additive claim"

Participant's awareness about food additive claims range from unfamiliar, hesitant, to familiar (Table 6.35). When the participants were unfamiliar with the term (statements 6.35.1-6.35.4) they had no idea about it or tried to explain it wrongly. Thus, these participants could not make use of food additive claims during their purchasing decision. Thus, with regard to these participants, a claim was a worthless marketing tool for manufacturers (NCC, 2003:19; Mellentin, 2005:17-18). The NCC (2003:5) indicated that the majority of consumers did not understand logos and claims. At the same time, some other participants in the present study were hesitant about the term (statements 6.35.5-6.35.7). When consumers were unsure of themselves or had limited awareness about additive claims they tended to guess. Therefore,

they were aware of additive claims but not sure how to use them. This means these that these consumers will probably follow the peripheral route to persuasion when processing food additive information.

In addition, to the previous categories some participants in this study did indeed know what a food additive claim was (statements 6.35.8-6.35.11). Williams *et al.* (2004:36) indicated that claims such as "no preservatives" are found to be useful to consumers. Hence, these participants can use food additive claims when making purchasing decisions. Specific knowledge about food additive claims (stimuli) facilitates information processing via the central route (Antonides & Van Raaij, 1998:210). Furthermore, prior knowledge enhances consumers' ability to understand a message (Petty & Cacioppo, 1986:8).

Table 6.35 Theme 1: Participants' perceptions of the term "Food additive claim"

Category	Concept	Sub concept	Participants' statements
Unfamiliar with term	No idea		6.35.1. Nobody knows. 6.35.2. Picked it up, but didn't really know what it meant. 6.35.3. I don't know...
	Explain term wrongly	Choice grade association	6.35.4. I check on tinned food [to find out] whether it's choice grade.
Hesitant about term	Unsure	Tartrazine free association	6.35.5. Do you mean like tartrazine free?
		AB culture association	6.35.6. Is that not like the AB cultures in yoghurt? They say it contains it.
	Relate to specific health concern		6.35.7. If you have someone in the family with a problem like that, you look for it, otherwise perhaps not.
Familiar with term	Explain term correctly	MSG free	6.35.8. They are not allowed to add MSG.
		Vitamin enrichment	6.35.9. Like Kellogg's seven vitamins which are added.
		Preservative free	6.35.10. It is "no preservative"
		Additive free	6.35.11. Contains none of it [food additives].

6.3.3.14.2 Theme 2: Examples of food additive claims as perceived by participants

As shown in Table 6.36, different types of food additive claims were mentioned by the participants in this study. The participants' ability to list food additives claims was of significance to this study. Ability was one of the factors that is needed for information processing (Petty & Cacioppo, 1886:99). As mentioned before, the types of additives participants search for is an indication of their awareness about particular additives and to what extent they were exposed to food additive claim information. Moreover, tartrazine and MSG claims were mentioned, thereby reemphasizing the previous finding (Table 6.16 & § 6.3.1.4) that these additives were more "top of mind" to the participants.

Table 6.36 Theme 2: Examples of food additive claims as perceived by participants

Category	Concept	Sub concept	Participants' statements
Types of claims	Specific food additive claim terms	Tartrazine free	6.36.1. Tartrazine free.
		MSG related claims	6.36.2. No MSG added/No added MSG. 6.36.3. Natural MSG. 6.36.4. No artificial MSG.
		Vitamin enrichment	6.36.5. Added Vitamin. B and C. 6.36.6. Seven vitamins which are added.
		Presence of nuts	6.36.7. May contain peanuts. 6.36.8. Traces of nuts.
	General food additives claim terms	Omitted substances	6.36.9. "No preservatives added"/"no preservatives". 6.36.10. "No additives added".
	Non food additive specific claim	Removal of substance	6.36.11. Caffeine free.

6.3.3.14.3 Theme 3: Participants' beliefs about food additive claims

Two important categories (Table 6.37) of consumers' beliefs about food additive claims emerged from this question, namely untrustworthy (statements 6.37.1-6.37.25) and trustworthy (statements 6.37.26-6.37.31).

Table 6.37 Theme 3: Participants' beliefs about food additive claims

Category	Concept	Sub concept	Participants' statements
Untrustworthiness of food additive claims	Avoidance message		6.37.1. It says 'stay away'.
	No guarantee		6.37.2. No guarantee. 6.37.3. Won't mean anything to me… think it's not worth the effort at all. 6.37.4. Are they really genuine?
	Confusion caused		6.37.5. I think they often mislead you.
	Deceptive		6.37.6. …it's misleading. 6.37.7. ...don't trust... 6.37.8. ... nice promises ...
	Useless information		6.37.9. Load of junk.
	Disbelief	Discrepancy in food additive content claim and shelf-life	6.37.10. No, I don't think it's the truth. To process food they must add something to give the thing a shelf-life. I don't agree that they don't add anything, and I think that in fact they do add things. 6.37.11. I have no point of reference. They can tell me 'no additives added', but what guarantee do I really have? [I] agree, there must be a preservative; otherwise the shelf-life would only be two to three days.
		Discrepancy between claim and product attributes	6.37.12. 'No added MSG' – then there is MSG somewhere in there. 6.37.13. For instance they say coffee is caffeine free, but does it really not contain any caffeine? We don't know… You [yourself] didn't test it in a laboratory.... 6.37.14. Vitamins are destroyed by all kinds of processes. 6.37.15. It won't mean anything to me after all the processes. It's not worth it at all. (Losses as a result of processing.) 6.37.16. They talk about the placebo effect, and I wonder how much of that isn't also applied to our products.

Table 6.37 (continued) **Theme 3: Participants' beliefs about food additive claims**

Category	Concept	Sub concept	Participants' statements
		Discrepancy between ingredient list and claim	6.37.17. 'No preservatives added' often contradicts what is on the ingredients list. 6.37.18. Read everything and don't just look at the nice promises on the front. 6.37.19. ...don't trust – read ingredients list...
	Unsure about regulator skills	Lack of expertise	6.37.20. I think the government itself is very ignorant ... 6.37.21. ...they don't have the experts to advise them...
	Concerned about food additives	Large amount of bad additives added	6.37.22. Then it makes you worry if you think about how much stuff is added, that they claim is added. [Too much can be harmful.]
		Small amount of good food additives added	6.37.23. What worries me are the claims they make, it's such a small percentage of your RDA that you're ingesting. [See it in terms of vitamins, too little to have an effect.]
	Encourage sales	Marketing of product	6.37.24. Think it's a draw card for more sales. 6.37.25. It's for marketing purposes and not for health purposes.
Trustworthiness of food additive claim	Clarity of information		6.37.26. If you turn it over it says 'no preservatives, may contain peanuts, no this', they explain everything, especially if you're allergic. That's what I'm looking for.
	Renowned retailer	Product claims	6.37.27. 'No preservatives', Woollies is a wonderful place to buy. 6.37.28. I like Woollies' standards. 6.37.29. Some of Woollies' products say 'natural MSG/no artificial MSG'.
	Endorsements by health organisations	Confidence in products	6.37.30. [The] Weigh-Less sign on products indicates the salt content and is important to me.
	Reveal information	Avoid food additives	6.37.31. ... If they say "no MSG" it is great! otherwise great possibility that product got MSG.

Participants believed that when a claim was untrustworthy they should avoid it (statement 6.37.1), it provides no guarantee (statements 6.37.2-6.37.4), it is confusing (statement 6.37.5) it is deceptive (statements 6.37.6-6.37.8) and useless information (statement 6.37.9). Claims that products are free from additives are likely to support continuing consumer misbeliefs that such ingredients are potential hazards and should be avoided (Williams *et al.*, 2004:38). Various authors (Nancarrow *et al.*, 1998:113; Garretson & Burton, 2000:225; Paterson, 2003:28) argue that misleading, unethical or ambiguous product claims could fuel consumer confusion. Furthermore, the FD&C Act, as well as the FC&D Act, (SA, 2007:30) prohibit the placement of false or misleading claims on foods (IFIC, 2006a:1).

In other studies (Paterson, 2003:17; Crawford & Baghurst, 1990:233) some participants stated that companies lie on labels and that they do not trust big businesses. Food must fulfill the claim being made and adequate information must be available to show that the claim was justified. When a claim is potentially ambiguous or imprecise, the likely understanding of an average consumer should prevail (FSA, 2004:6). It is possible that consumers may not have the time or the motivation to consider food additive information and may solely rely on the claim. The possible misleading effects of the claim may be particularly problematic. The health claim might produce "halo effects" on related and unrelated attributes that are not corrected by ingredient information (Ford & Hastak, 1996:25).

Although some participants in the present study had a disbelief in food additive claims, there was an indication that they were in fact able to use claims. This is shown in the three sub concepts of:

- discrepancy in additive content claim and shelf-life (statements 6.37.10-6.37.11);
- discrepancy between claim and product attributes (statements 6.37.12-6.37.16); and
- discrepancy between ingredient list and claims (statements 6.37.17-6.37.19).

Statements 6.37.22-6.37.23 about the consumer concerns and the amount of additives used were re-emerging within follow-up focus group sessions (Table 6.2, statement 6.2.4 & Table 6.3, statement 6.3.6). Moreover, Williams *et al.* (2004:36) argue that one reason for the continuing concern that consumers have about additives is the widespread use of negative claims such as "preservative free" claims on food products. The FSA (2004) further added

that the issues of brand familiarity, taste, overall product appeal and "naturalness" of ingredients were much more important to consumers' decision-making process than claims. Some participants argued that food additives claims were used by manufacturers to encourage sales (statement 6.37.24-6.37.25). Mellentin (2005:17), on the other hand, stated that claims were just one communication tool among the many that were available to companies. It is a less effective tool than public relations and word-of-mouth recommendations that follow when a product actually delivers the benefits that consumers could feel and experience. Ingredient suppliers should be asking themselves how they can invest in building consumer awareness of the health benefits of their ingredients. Building awareness requires a long-term and heavy investment in consumer education (Mellentin, 2005:18).

On the other hand, some participants in this study thought that a food additive claim was trustworthy when the information was clear (statement 6.37.26), it was used by a renowned retailer (statements 6.37.27-6.37.29), endorsed by health organisations (statement 6.37.30) and it revealed information about additives they wanted to avoid (statement 6.37.31). Clarity of information (statement 6.37.26) was an indication of the need that the participants have about food additive claims. Similar to the statement 6.32.39 about the particular retailer's labelling scheme, which should serve as an example of what consumers expect from a food label, some participants indicated that this is also true about food additive claims (statements 6.37.27-6.37.29). Advertising claims that food is natural, without additives or artificial ingredients, have taken on great importance in marketing. As marketing claims become more strident, it is necessary to gain better understanding of natural foods in order to safeguard food quality and for the prevention of fraud (Piggott & Paterson, 1999:iii). In SA the word "natural" may not be used on the label of foodstuffs as indicated by regulation 51 (SA, 2007).

The statement 6.37.30 about endorsements was a re-emerging concept within follow-up focus group sessions (§ 6.3.3.11.1, Table 6.29, statement 6.29.21 & Table 6.33, statement 6.33.1). The frequency of its appearance during the focus group discussions might be an indication of its importance as an information source to participants. Crawford and Baghurst (1990:233) found that claims made by a recognized health authority would be accepted by a large proportion of the population. Similar to the statement 6.37.30, Williams *et al.* (2004:37) and

Crawford and Baghurst (1990:232) found that participants read food labels to avoid a particular ingredient or to avoid getting too much of it.

6.3.3.15 Influence of food additive claims on participants' purchasing behaviour

Question 15 How do food additive claims influence your purchasing decision?

Only one **theme,** namely the **influence of food additive claims displayed on food product labels on participant's purchasing behaviour** emerged from this question. The objective of question 15 (Annexure I) was to determine how the reception of additive information influences the purchasing behaviour of consumers by exploring food additive ingredient claims on product labels (§ 6.1). Three categories of significance for application of the model of consumers' perceptions of food additives and consequent purchasing behaviour emerged from this question (Table 6.38). Participants indicated that they would either buy (statements 6.38.1-6.38.7), not buy (statements 6.38.9-6.38-17) or buy something else (statement 6.38.8) in response to a food additive claim. Furthermore, participants indicated their intention to buy products which bear a "free" (statements 6.38.1-6.38-3), "no X added" (statements 6.38.4-6.38.5), "natural" (statement 6.38.7) or an ingredient "warning" (statement 6.38.6) claim.

Reasons why participants will not buy a product bearing a food additive claim, were because it contains colourants (statements 6.38.9-6.38.11). Klein (2005:56) also indicated that participants will not buy a product containing colourants and preservatives. Another concept that could lead to "no purchase" was when a discrepancy between the claim and the ingredient list exists (statement 6.38.12-6.38.13, & Table 6.37, statements 6.37.17-6.37.19). Participants' belief that a product was deceitful was another concept that could lead to "no purchase" (statements 6.38.14-6.38.16). Food should be sold without deceit and should be labelled to enable the purchaser to make fair and informed choices, based on clear and informative labelling (FSA, 2004:6). Lastly a participant indicated that the total avoidance of products containing food additives leads to "no purchase" (statement 6.38.17). This is in line with Abbott's (1997:47) finding that information on food labels often or sometimes affected consumers' purchasing decision.

Table 6.38 Theme: The influence of food additive claims displayed on food product labels on participant's purchasing behaviour

Category	Concept	Sub concept	Participants' statements
Will buy	Free claims	Caffeine free	6.38.1. Especially caffeine free
		Tartrazine free	6.38.2. Tartrazine free
		No alcohol	6.38.3. 'No alcohol' – then I'll buy it.
	Not added claims	No MSG added	6.38.4. … no MSG added …
		No preservatives	6.38.5. … no preservatives …
	Possible presence of substances	May contain peanuts	6.38.6. "'May contain peanuts.' That's what I'm looking for. I definitely take the packet with that statement.
	Only natural products		6.38.7. A lot, if I could I would only use natural products.
Buy something else	Compare amount of additives in products		6.38.8. Will believe to some extent, won't believe completely, looks better than others next to it with the incredible amount of additives. Then you think it's the better one, let me buy it.
Will not buy	Colourants		6.38.9. Tartrazine, colourants, aspartame – I don't want it. 6.38.10. ...avoid anything which contains colourants. 6.38.11 ...just don't buy ANY red cold drinks… I'm completely against red cold drinks…
	Discrepancy between claim and ingredient list exists	No preservatives	6.38.12. For example, under 'ingredients', if it says, 'sea salt', but 'no preservatives', then the salt is still the preservative. 6.38.13. Even 100% fruit juice contains stuff like that [preservatives].
	Belief that product is deceitful		6.38.14. Lies we find for sale on the shelves today are not so dramatic, it's extremely difficult, without first having checked whether the label is the truth or not. 6.38.15. Sales gimmick to me. 6.38.16. Look at rice cakes. It usually says 'no preservatives'. … do you know what one can eat in that thing? [Free translation for the sake of idiomatic correctness: Anyway, I don't think this product has any nutritonal value].

Table 6.38 (continued) **Theme: The influence of food additive claims displayed on food product labels on participant's purchasing behaviour**

Category	Concept	Sub concept	Participants' statements
	Avoidance of products containing food additives		6.38.17. ...and if you really look at all that stuff it's very difficult to buy something.

All the concepts in Table 6.38 can be seen as coping strategies utilised by the participants when making food choices about food products bearing a food additive claim. Consumer's that utilise claims to act as a shortcut to decision-making demonstrate their desire for a solution to the problem by avoiding certain additives (NCC, 2003:7). There is, however, very little evidence that having a health claim on a product will result in increased sales. The function of a claim is a marketing message to tell consumers what benefits the product will provide them with, thereby encouraging them to buy the product (NCC, 2003:19).

Such claims facilitate consumers to make well-informed food choices, which in turn might contribute to improvement of public health in general (Van Trijp & Van der Lans, 2007:305). It is, therefore, critical for manufacturers to make their labelling as relevant and clear to their consumers as possible, given that consumers are increasingly making purchasing choices based on the information on the packaging (ACNielsen, 2005). A survey (Drew & Lyons, 1987:50) about additives showed that 35% of respondents claim to have stopped buying a product because of additives and 43% claim to have started buying a product because it was additive-free or low in additives. Participants in the present study perceived tested products as safe and they will purchase such products.

6.4 SYNOPSIS

The results of the unprompted awareness scenario indicated that tartrazine, MSG and aspartame were more on "top of mind" than any other food additive. Participants were in general uninformed and unable to use additive terms correctly, although they claimed that

they were food additive label readers. This may indicate that participants have a limited ability to avoid products containing additives they may perceived as unhealthy effectively.

The main theme arising from the prompted awareness scenario was that food additive label reading participants utilized a food additive claim if it was provided on the food label. Another theme was that participants scrutinized the ingredient list for food additives when asked to choose between two or more products for a potentially life-threatening health condition. If the participants were unsure of themselves they tended to guess which one is correct. The last phenomenon indicated a lack in participants' knowledge with the consequence that they can not fully utilize the information provided on a product label.

Qualitative content analysis of the focus group discussions resulted in the identification of 33 subtle underlying themes raised during the discussion's themes about food additives and labelling perceptions. The themes yielded valuable information about the nature of participants' concerns, motivations and perceptions. The participants' general perceptions suggested that food additives can be defined as the addition of chemical substances to foods that hold some benefits and/or risks.

The results indicated that the participants' were of the perception that manufacturers used food additives to provide some benefits to consumers and simultaneously facilitate their marketing strategy through unethical motivations. Furthermore, participants have the perception that manufacturers hide information by making use of E-numbers instead of using chemical names. The strong perception of dishonesty and profit-driven objectives of the manufacturers indicates a possible blocking mechanism, influencing purchasing behaviour negatively. During this study the consumers focused mostly on preservatives, colourants, flavourants and nutritional additives with limited reference to the food additive categories of texturising agents and miscellaneous food additives.

The concepts of lack of information, lack of knowledge, lack of understanding and feelings of confusion were found in many areas of food additives and their labelling. It included confusion about food additive names, claims, and E-numbers. Some participants associated the E-numbers and hence additives, with product risks such as poison and tried to avoid them.

At the same time, goodness was associated with some E-numbers and additives such as vitamins. Some participants indicated that they are unconcerned about the E-numbers. Moreover, some participants indicated that they will not buy a product having E-numbers in the ingredient list. The concept of "selective purchase" indicated that some participants will buy a product in the absence of the E-number when they want to avoid that particular additive. During low purchasing involvement the participants select the product regardless of the presence of the E-numbers or additives they want to avoid due to a time constraints in finding such information. The amount of time available was another blocking mechanism in food additive label reading consumers' decision-making process.

There were two reasons for the non-use of labels. Participants were either disinterested in labels because they were in the habit of purchasing the particular product or they had previous positive experiences with the particular product, rendering the use of labels unnecessary. Furthermore, ingredient information was used the most when purchasing products for the first time. The participants indicated that they do read labels and use preventative purchasing as a strategy to reduce their concerns about additives. Coping strategies applied by the participants were to limit the use of food additives, individual efforts to buy additive-free foods and the use of home-made foods which were prepared with unprocessed raw materials.

Participants identified a variety of concerns about food additives such cancer, allergies, asthma and hyperactivity. When consumers have real concerns, they fail to trust food regulators, manufacturers and processors. Therefore, a decrease in trust can act as a barrier in the information processing and can influence purchasing behaviour. Specific health risks, product quality and uncertainty about product content led to "will not purchase" decisions. The concept of risk is important for understanding how consumers make food additive choices influencing not only decision-making, but also the information search and consequent purchasing behaviour. The concepts of information search, personal preference and value for money described the category selective purchasing.

In terms of sufficient information some participants indicated that the information about additives on labels was understandable, they used it, trusted it and could make informed choices adequately. Unfortunately, in some cases food additive information provided no

assistance in the purchasing decisions of some participants. Some participants either did not know or were uncertain about food additive legislation. This might be an indication that consumers are not appropriately exposed to legislation in SA. On the other hand, there were participants who were certain about legislation. More specifically, participants were seeking improved legislation with more effective control.

A variety of important information sources was mentioned such as newspapers, health professionals, participants' own experience and word-of-mouth from family and friends. Important information about the perceptions, opinions and use of the different information sources was revealed, which was an unexpected finding. Information was regarded as trustworthy when it was endorsed by health organisations or presented by well-known professionals. Trusted endorsements serve as a shortcut for consumers in their decision-making process. On the other hand, there were some participants who did not trust endorsements. Thus, trust of endorsements could influence purchasing behaviour positively or negatively depending on whether consumers used it as a shortcut in product selection or whether it is a blocking mechanism. Information was regarded untrustworthy when participant perceived the information as of financial benefit to the manufacturers and publishers. Information overload was another important barrier or blocking mechanism in information processing of participants, resulting in poor purchasing decisions. Contrary to the findings regarding information overload, there was evidence that the some participants wanted to know more about food additives and indicated that labels should carry more information.

In terms of insufficient information, some participants indicated a lack of standardisation in the terminology used on the label. Unclear terminology or unfamiliar information, pointed out that some consumers did not have the ability to process such information. Inadequate information was a re-emerging concept and might be an indication of the participants' strong perceptions about inadequate information on food labels. The perception that more information on labels would lead to an increase in product prices was a phenomenon that can be seen as a blocking mechanism for consumers when purchasing food products containing additives. According to a number of participants food additive label information was not trustworthy and label legibility was a problem.

Some participants in this study did know what a food additive claim was although they utilised food additive claims when making purchasing decisions. Moreover, claims, information search and concerns about tartrazine and MSG were mentioned, thereby reemphasizing the previous findings that these additives were more "top of mind". Participants believed that when a claim was untrustworthy they should avoid it. In addition, the participants indicated that some claims provided no guarantee, it was confusing and it was deceptive and useless information. Misleading, unethical or ambiguous product claims could fuel consumer confusion.

Participants indicated their intention to buy products which bear a "free", "no X added, "natural" or an ingredient "warning" claim. On the other hand, the reasons why participants will not buy a product bearing a food additive claim were because it contained colourants and when a discrepancy between the claim and the ingredient list exist. Participant's belief that a product is deceitful was another concept that could lead to "no purchase". Lastly, a participant indicated that the total avoidance of products containing food additives leads to "no purchase". The data revealed various coping strategies utilised by the participants when making food choices about food products bearing a food additive claim. It is, therefore, critical for manufacturers to make their labelling as relevant and clear to their consumers as they can, given that consumers are increasingly making purchasing choices based on the information on the packaging.

In order to comprehend the results of the empirical part this study the researcher applied in Chapter 7 the proposed Elaboration Likelihood Model on consumer perceptions of food additives. This was done in order to explain information processing and consequent purchasing behaviour of a selected sample of South-African consumers' when they utilized food labels.

CHAPTER 7

A MODEL OF CONSUMERS' PERCEPTIONS OF FOOD ADDITIVES AND CONSEQUENT PURCHASING BEHAVIOUR

7.1 INTRODUCTION

The purpose of Chapter 7 was to apply the proposed Elaboration Likelihood Model (ELM) to consumer perceptions of food additives in order to explain information processing and consequent purchasing behaviour of a selected sample of South African consumers. The ELM was utilised to comprehend the results of the empirical part this study (§ Chapter 6).

Food labelling is an accepted method through which consumers are provided with the information they need in order to make meaningful food purchasing choices (Wandel, 1997:212; FAC, 2002:14), although it is not the only information source (Feick *et al.*, 1986:212). As consumers become more sophisticated and better educated with regard to the risks of food additives (Branen & Haggerty, 2002:7), their demands and expectations regarding food labelling become greater (Crawford & Baghurst, 1990:231; Schmidt, 2000:81; FAC, 2002:1). At the same time, changes in the food supply system in terms of food additives mean that consumers are faced with a greater choice and more complex decisions than ever before (FAC, 2002:1). Consumers reading the ingredient labels on many processed foods seem to have developed a wide range of emotions and perceptions, ranging from embarrassment at not being able to pronounce the tongue-twisting chemical names, to utter panic about the perceived hazards of the "unnatural chemical feast" that greets the consumer in-store (McWilliams, 2005:547). Despite consumers' perceived concern about the unhealthiness of food additives, Davies and Wright (1994:61) found that almost half of the consumers in their study were unable to give a single example of a food additive. Therefore, there was a need to investigate consumer's perception of the food additive information provided on food labels in order to understand the sense consumers make of food additive labels.

A model of consumers' perceptions of food additives and consequent purchasing behaviour can provide manufacturers, label designers, retailers and academics with an enhanced understanding of consumers perceptions and use of food additive labels and other information sources during the information search phase of product selection. It can also provide a platform from which further studies on food additive labelling can embark. Moreover, the present study was of value for consumers because if the food industry, markets, educators and regulators apply the findings of this study, consumers could be better informed, suitable regulations will be promulgated and consumer education programmes can address the needs and wants of the consumers better in terms of food additive and food additive labelling.

7.2 A MODEL OF CONSUMERS' PERCEPTIONS OF FOOD ADDITIVES AND CONSEQUENT PURCHASING BEHAVIOUR: APPLYING THE ELABORATION LIKELIHOOD MODEL

The proposed model (Figure 4.1 & § 4.4) coupled with the empirical findings of this study (Chapter 6) led to the development of a conceptual frame of reference, describing the phenomenon of consumers' perceptions about food additives through the eyes of consumers. The adapted model (Figure 7.1) logically describes consumers' perceptions about food additives and food additive labelling during information processing and decision-making and its influence on consumers' purchasing behaviour. The researcher consulted the models of the perceptual process (§ 3.2) information processing (§ 3.3.2) and, consumer decision-making (§ 3.4.1) and applied and adapted them according to the empirical data and findings as described in Chapter 6. Moreover, Erasmus *et al.* (2001:87) suggest that complex decision-making models should not be generalised, but rather be context and product (for this study food additive ingredient) specific (for this study food additive information searching consumers). Consequently, such models provide new insights and assist in building theory in the domain of consumer sciences.

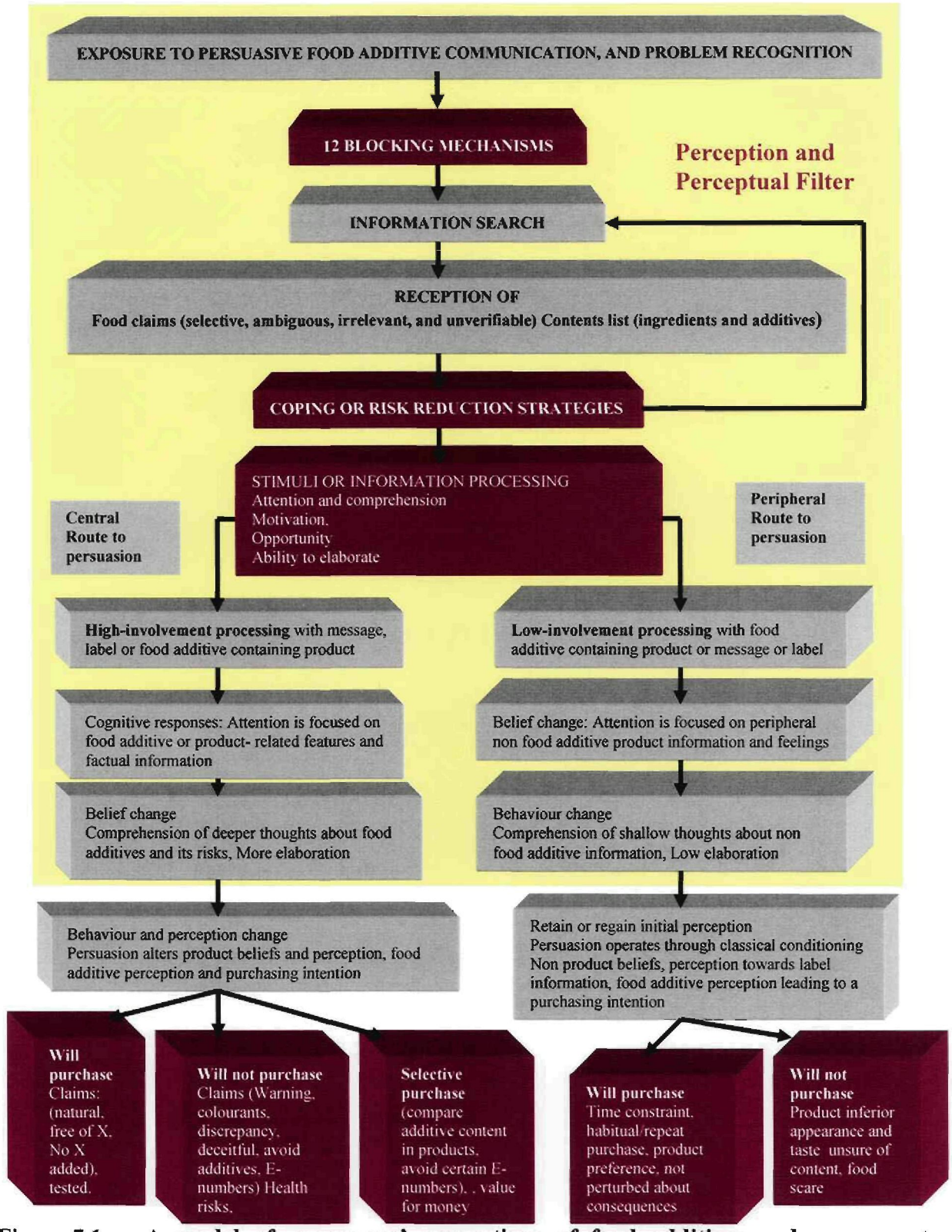


Figure 7.1 **A model of consumers' perceptions of food additives and consequent purchasing behaviour (Adapted and applied from Petty and Cacioppo (1986:4), Wright (1997:425), Hawkins *et al.* (2004:400), Solomon (2004:282) and Peter and Olson (2008:428))**

7.2.1 Exposure to persuasive communication and problem recognition about food additives

The model (Figure 7.1) indicates that the consumers are exposed to persuasive communication and problem recognition through advertising, in-store promotions and food labels (§ 4.4.1). The results of the present study indicate that participants were exposed to a variety of persuasive food additive communication sources on an impersonal level (Table 6.22) and on a personal level (Table 6.23). Participants indicated that they integrate food additive information in practice (Table 6.27). The various communication media play a major role in food information dissemination in modern consumer societies (§ 2.15 & 3.3.1.3), thereby creating consumer awareness about food additives. Participants in this study were aware of food additives to different extents as seen in sections 6.3.1 and 6.3.2 which determine consumers' prompted and unprompted awareness.

Consumers' awareness of food additives could lead to the recognition of a problem (Figure 7.1). Participants in this study (Table 6.6) regarded food additives as unnatural chemical substances added to food products which are bad for one's health (statements 6.6.1-6.6.3). More specifically, statements 6.16.25-6.16.26, indicated that consumers are concerned about the relationship between additives and cancer as well as additives and hyperactivity (statements 6.8.5-6.8.7, 6.27.6 & 6.25.2), thereby recognising the problem that food additives can be detrimental to their health. The problem causing additive names mentioned most were sodium benzoate, tartrazine, MSG and aspartame (Table 6.16 & § 6.3.1.1 & § 6.3.1.4). In addition participants mentioned that some food additives do have benefits (Table 6.7) thereby indicating their awareness of food additives.

As shown in Figure 7.1, consumers form perceptions about additives when they are exposed (§ 3.2.1) (Figure 3.1) to food additive information through a single or variety of persuasive communication sources (§ 3.3.1.3) as well as when they recognise a problem causing additive, such as tartrazine. Note that exposure is also selective (§ 3.2.4.1). Moreover, exposure is critical to consumers' subsequent processing of any stimulus (Hoyer & MacInnis, 2001:81).

7.2.2 Blocking mechanisms in food additive decision-making

The next step in Figure 7.1 indicates the various blocking mechanisms (§ 3.2.4.2) created and used by food additive label reading participants in the present study. Most decision-making models do not include blocking mechanisms, while only a few (Rousseau, 2003a:117; Cant *et al.*, 2006:196) consider these mechanisms. Blocking mechanisms were described in the complex decision-making model (§ 3.4.1.2 & Figure 3.6) of Rousseau (2003a:114). The results in the present study indicate that some participants were confronted with blocking mechanisms during their information search, selection and purchasing of food additive containing products. The concept was, therefore, included in the context and product specific model (Figure 7.1) that was adapted for this study.

According to Rousseau (2003a:117) and Cant *et al.* (2006:196), the overcoming of blocking mechanisms is an important step in the complex decision-making process (such as selecting foods that contain additives). Of the individual determinants in the complex-decision-making process, distorted perceptions probably have a direct effect as blocking mechanisms (Rousseau, 2003a:115). Similar to problem recognition, blocking mechanisms can occur at various stages in the decision-making process, such as the need for more information (Rousseau, 2003a:117; Cant *et al.*, 2006:196), but were presented in Figure 7.1 in a linear fashion as indicated by Rousseau's (2003a:117) model.

Various blocking mechanisms as indicated by the participants were identified when analysing the focus group data. The 12 blocking mechanisms (Figure 7.1) included a lack of standardisation of terminology on food labels (statements 6.21.28-6.21.29, & 6.29.1-6.29.3), illegible ingredient listing on labels (statement 6.21.30), lack of food control and regulation (statements 6.20.14, 6.21.25-6.21.27, 6.32.10-6.32.12 & 6.34.10), incorrect or untrustworthy information (statements 6.24.5-6.24.10), insufficient information (statements 6.29.13-6.29.14), information-overload (statements 6.26.2-6.26.4), uncomprehensive information (statement 6.9.4), increase in product price due to more information provision (statement 6.32.27), manufacturer dishonesty (statement 6.18.8), distrust in local produce (statements 6.16.68-6.16.69), uncertainty about the expected outcome of additives (statement 6.19.11), and time constraints (§ 7.2.6.2).

For example, the result of information overload is consumer confusion which in turn results in poor purchasing decisions (Schiffman & Kanuk, 2004:229) (§ 3.3.1.4). As a consequence, consumers tended to see only what was relevant, meaningful, personal and valued. This resulted in the erection of filters to block out most of the information that was not specifically relevant to them (NCC, 2003:3). Thus perception and the filtering of food additive information through a consumer's perceptual filter (as shown in Figure 7.1) plays a significant role in consumers' creation of blocking mechanisms. It is also known as perceptual defense (Hanna & Wozniak, 2001:111; Rousseau & Spoelstra, 2003:223).

7.2.3 Information search

The next step in the model of consumers' perceptions of food additives and consequent purchasing behaviour was information search (Figure 7.1). Information search was discussed in section 4.4.2. Generally consumers seek information (§ 3.3.1) that will assist them in achieving their goals or satisfy their needs and wants (Assael, 1995:161; Solomon, 2004:296; Cant *et al.*, 2006:196) or to solve a problem (Hawkins *et al.,* 2004:526). The information search or acquisition (§ 3.3.1) is selective, because consumers choose information that is most relevant to their needs and most likely to conform to their beliefs (Rousseau, 2003a:118).

The data indicated that consumers were concerned about the lack of information (statements 6.18.9, 6.29.1-6.29.15 & 6.32.1-6.32.6 & Table 6.34) about food additives. Limited knowledge can stimulate a search for more information (Assael, 1995:228; Sheth & Mittal, 2004:287-292). Participants further indicated that the reasons for their information search about food additives were based on additive alerts (statements 6.27.5-6.27.10) or alternative information (statement 6.27.11) that they found in the "popular" media. Thus media reports, such as those mentioned by the participants, could probe consumers' to increase their search for more information about the topic of food additives.

Various information sources were used by participants as mentioned before (§ 7.2.1). With regard to information sources, participants indicated that they were not trustworthy (statements 6.14.24-6.14.29 & 6.24.5-6.24.10) or they distrusted information (statements

6.16.57-6.16.69). Persuasion or behaviour change is less likely to occur if the information about additive is not seen as being truthful (Bredahl *et al.*, 1998:270). In the ELM, trustworthiness is one of the components of source credibility (Antonides & Van Raaij, 2004:212; Hawkins *et al.*, 2004:401; Solomon, 2004:258; Cant *et al.*, 2006:153) and is a motivational factor (§ 7.2.6.2) (Worsley, 1994:229) during information search. Thus the credibility of the manufacturer is an important component in the ELM (Petty & Cacioppo, 1986:172; Antonides & Van Raaij, 1998:212; Solomon, 2004:258). When the credibility of the information source is high then the consumer is likely to follow the central route to persuasion, but when credibility is low it is more likely that the peripheral route will be followed (Bredahl *et al.*, 1998:270). A decrease in trust or distrust can act as a barrier in the information processing and can influence purchasing behaviour.

7.2.4 Reception of food claims and ingredient list

The types of additives participants search for is an indication of their awareness and reception (Figure 7.1) of information about the particular additives (§ 4.4.3).

7.2.4.1 *Claims*

As shown in Table 6.36, the different types of food additive claims were mentioned. Consumers' choices of additive free foods depended on how consumers perceive and understand claims (Figure 7.1). Participant's awareness about food additive claims in this study ranged from unfamiliar to hesitant to familiar (Table 6.35). The importance of this finding is that consumers need to be familiar with claims in order to recall this information (Solomon, 2004:101). When consumers were unsure or had limited knowledge about additives claims they tended to guess. The concepts of unfamiliar and unsure indicated that the participants will probably follow the peripheral route of persuasion. On the other hand, when consumers have specific knowledge (familiar) about, for example, food additive claims (stimuli), they follow the central route (Antonides & Van Raaij, 1998:210) of persuasion.

The results of this study (Table 6.37) revealed that participants regarded food additive claims as either untrustworthy (statements 6.37.1-6.37.25) or trustworthy (statements 6.37.26-6.37.31). Participants believed that when a claim was untrustworthy they should avoid it, it provides no guarantee, it was confusing, it was deceptive and useless information. Misleading, unethical or ambiguous product claims could fuel consumer confusion, thereby significantly influencing purchasing behaviour. Thus food additive claims, according to the findings of this study and according to Wright (1997:425), can be seen as ambiguous, selective, unverifiable and irrelevant.

7.2.4.2 *Ingredient list*

The reception of the ingredient or content list (Figure 7.1) was of significance in the present study. Participants in this study showed a variety of perceptions, such as that they were concerned about a variety of additives on food labels (Table 6.36 & statements 6.16.1-6.16.17) and products containing additives (Table 6.36 & statements 6.16.18-6.16.24) and the multiple risks that food additives may exhibit (Table 6.18). On the other hand, some participants indicated that additives were safe for health (Table 6.20, statements 6.20.12-6.20.14) and beneficial to consumers (Tables 6.7 & 6.10). In general E-numbers are stimuli that consumers take into consideration when reading product labels and they have specific perceptions about E-numbers (Table 6.14). Thus manufacturers should consider the consumers' understanding about E-numbers when designing their food labels. Moreover, consumer educators should include a section about E-numbers in their programme in order to assist consumers in their food choices.

According to the results of this study, the ingredient list contains inadequate information (statements 6.28.6-6.28.7 & 6.29.1-6.29.15, Table 6.34), participants were uncertain about product contents (statements 6.19.11 & 6.29.13-6.29.14), unsure about E-numbers (statements 6.14.1-6.14.13), and uncertain about what was permitted to be displayed on food labels (Table 6.20 & Table 6.21). In addition, some participants indicated that the information provided by manufacturers (Table 6.34) was, for example, unbeneficial, unclear, to them. Participants who used food additive labelling found it confusing (statements 6.32.22-6.32.23) or difficult to

understand. The participants' perception of worthless information (statement 6.32.25-6.32.26) indicated that participants could not utilise the information provided to them.

Thus, consumers' reception of food additive content list information (Figure 7.1) depends on their perceptions as filtered through the perceptual filter (Cant *et al.*, 2006:118) (Figure 7.1) about the types of additives used, their risk perception, concerns and consumer benefits. It is thus a case of balancing the benefits versus risks of additives before a purchasing decision can be made.

7.2.5 Coping or risk reduction strategies

Consumers characteristically develop their own strategies for reducing perceived risks (§ 3.3.1.2 7 & 3.3.2.1). These risk reducing strategies (Figure 7.1) enable consumers to act with increased confidence when making purchasing decisions, even though the consequences of such decisions remain somewhat uncertain. One of the more general risk reduction strategies is an increased information search (Schiffman & Kanuk, 2004:198) before making a purchase (Assael, 1995:236). This is indicated in Figure 7.1 with the feedback loop. The higher the risk those consumers' perceived about the ingredient, the greater the extent of the information search (Figure 7.1). (Hanna & Wozniak, 2001:291; Hawkins, *et al.*, 2004:529; Schiffman & Kanuk, 2004:549; Sheth & Mittal, 2004:286; Solomon, 2004:295; Peter & Olson, 2008:179).

In the present study the participants indicated what strategies they use to reduce their concerns about food additive risks. These included the complete rejection of food additives or specific food additive containing products (statements 6.8.5, 6.14.21, 6.15.3, 6.19.11, 6.25.4-6.25.5, 6.38.9-6.38.11), limiting consumption of food additives by avoiding additives (statements 6.3.15, 6.3.71, 6.14.13, 6.14.23, 6.15.4, 6.17.1-6.17.6, 6.25.7, 6.25.13, 6.29.20, 6.32.24, 6.38.17) or by avoiding products with E-numbers (statements 6.14.19-6.14.21), searching for alternatives, (statements 6.25.3-6.25.6), resignation indicated that it was impossible to avoid or limit the intake of food additives (statements 6.17.6 & 6.16.74-6.16.78) and acceptance or negation of the risk. The last category (Table 6.17) of the theme of coping strategies indicated

that these participants were unconcerned about the consumption of food additives (statements 6.15.5, 6.17.7-6.17.15 & 6.28.14) and E-numbers (statements (6.14.32-6.14.34).

Another coping strategy as stated by Prättälä *et al.* (1985:238) in their study was "reaction of tightening the legal control of additive use". Similarly to this, as suggested by the participants of the present study (statements 6.21.19, 6.21.25 & 6.21.30) the researcher proposed a new reaction to reduce risk strategy, namely a need for research (statements 6.16.72-6.16.73, 6.21.19 & 6.21.25-6.21.30). Because consumers' risk reduction strategies are consumer specific, consumers choose strategies that comply with their perception. Therefore, the step of coping or risk reduction strategies were imbedded in perception and the perceptual filter (Cant *et al.*, 2006:118) (Figure 7.1).

7.2.6 Consumers' perception and the perceptual filter regarding food additives

Consumer perceptions (Figure 7.1) relate to human subjectivity that ultimately determines preferences on which consumers base their purchasing decisions (Hawkins *et al.*, 2004:27; Verbeke *et al.*, 2007:6). Selective perception was discussed in section 3.2.4. The perceptual filter (Figure 7.1) between reality and the individual's perception can be regarded as a kind of mirror that reflects, deflects or distorts factual information (Verbeke *et al.*, 2007:6). In other words, what is seen and felt and the meaning that consumers assign to it is filtered through their perception (§ 3.2.4, 3.2.4.3 & 4.3), which explains why different consumers may describe seemingly the same objects or occurrences uniquely. Consumers may screen out or modify information presented if it is in conflict with their previously learned beliefs (McNeill & Crotts, 2006:58; Cant *et al.*, 2006:118). For example, in statement 6.16.8 the participant perceived that "...anything that comes out of a laboratory is not good for you. Things that come from nature are good for you". This previously learned belief of the participant indicated that he/she is thus concerned about all artificial food additives and will not purchase products that he/she perceive to contain such additives.

Food choice is often influenced more by the psychological interpretation of product attributes than the physical attributes of the product itself (Yeung & Morris, 2001:170). Perception of

food safety risks (Tables 6.8, 6.16, 6.18 & 6.20) was one example of such a psychological interpretation which influences the purchasing behaviour of consumers (Table 6.19) of foods. Thus "The willingness to change behaviour is determined by perceptions and beliefs" (Figure 7.1) (Wilcock *et al.*, 2004:58).

7.2.7 Food additive stimuli or information processing

Once consumers are exposed to and/or searched for food additive information or stimuli, the interpretation process of attention and comprehension (Figure 7.1) takes place to facilitate consumers decision-making (§ 3.3.2.2 & Figure 3.5) (Wilcock *et al.*, 2004:60; Peter & Olson, 2008:109) via either the central or peripheral route to persuasion.

Moreover, the ELM (Figure 4.1 & Figure 7.1) is concerned with how information or stimuli is processed (§ 3.3.2 7 & § 4.4.4), (Davies & Wright, 1994:63) in low and high-involvement conditions (Assael, 1995:161). Depending on the person's level of involvement (Schiffman & Kanuk, 2004:235) and the personal relevance of this information, the receiver of the stimuli will follow one of two routes (Solomon, 2004:282) (§ 4.4.5) to persuasion. The central route (Figure 7.1) to persuasion (§ 4.4.5.1) is based on information processing whereby the advantages or benefits (statements 6.7.1-6.7.14 & 6.10.1-6.10.11) and disadvantages or concerns and risks (Tables 6.8, 6.16, & 6.18) of food additives and/or arguments in a message are extensively weighed against each other (Antonides & Van Raaij, 1998:207). On the other hand, under conditions of low-involvement, the peripheral route to persuasion (§ 4.4.5.2) is taken instead as shown in Figure 7.1 (Schiffman & Kanuk, 2004:235; Solomon, 2004:282). The peripheral route takes place via limited information processing. In this route the largest influence takes the form of simple cues in the message or stimuli (Antonides & Van Raaij, 1998:208). For example, participants choose and purchase food products on the bases of the colour of the product they see and not because of reading the label for the colourants that a product contains (statements 6.37.17-6.37.19 & 6.38.9-6.38.17).

Attention (§ 4.4.5.2) is the key that unlocks the door to perception (Coon, 2006:203) and is shown in Figure 7.1. The applied ELM illustrates (Figure 7.1) that attention is focused on

food additive and product related features and factual information when the central route to persuasion was followed by the participants. The stimulus characteristics (Assael, 1995:225; Hawkins *et al.*, 2004:295; Sheth & Mittal, 2004:131) play an important role in determining what the consumer notices and what the consumer ignores (§ 3.2.2). Stimulus characteristics such as larger stimuli are more likely to be noticed than smaller ones (Cant *et al.*, 2006:117) as confirmed by the data of the present study when participants indicated that ingredient information was illegible or too small to read (statements 6.21.29, 6.29.4-6.29.5). The position of food additive information on the label needs to stand out in order for the participants to noticed it. For example, participants in the present study found it difficult to find additive information (statements 6.21.28, 6.29.6, 6.29.12, 6.28.8 & 6.28.9). Furthermore, participants claimed to avoid unfamiliar food additives (statements 6.32.24), thereby indicating the importance of familiarity (Rousseau & Spoelstra, 2003:225) as a stimulus characteristic in food additive labelling.

The situational factors will be discussed under the heading of opportunity to process information (§ 7.6.6.2). The individual factors as discussed in section 3.2.2 were applied to participants' perceptions of food additives. Of importance to this study were the consumers' ability (§ 7.2.6.3) and knowledge (§ 7.2.6.4), motivation (§ 7.2.6.2) expertise on the relevant topic (statement 6.27.10), prior experience (statements 6.28.3, 6.30.1) and risk tolerances (§ 6.3.3.7, 6.30.4-6.30.6).

7.2.7.1 *Motivation of food additive label reading consumers*

The most important variable or factor effecting the motivation (§ 4.4.7.1) (Figure 7.1) to process a persuasive message is the personal relevance/involvement of the advocacy (Petty & Cacioppo, 1986:81). Thus the greater the personal responsibility for evaluating an issue, the more people should be willing to exert the cognitive effort necessary to evaluate the issue-relevant arguments presented (Petty & Cacioppo, 1986:93).

Table 6.30 showed some participants' non-label reading activities, for example, they were not perturbed about the consequences of food additive use (statements 6.30.4-6.30.6) or food

additive label reading are to time-consuming (statements 5.30.7-9.30.8). This may be an indication of low motivated (Balasubramanian & Cole, 2002), low-involvement (Hawkins *et al.*, 2004:501; Solomon, 2004:295) consumers, thereby following the peripheral route to persuasion. Low-involvement processing occurs when an individual is paying only limited or indirect attention to a message. Low-involvement processing tends to be limited due to a lack of elaborative activities (Petty & Cacioppo, 1986:219; Antonides & Van Raaij, 1998:208).

Personal relevance of food additives to the participants were indicated by multiple statements (statements 6.8.5-6.8.7 & 6.16.34-6.16.37), such as hyperactivity of their children. Participants in this study were exposed to a wide variety of food additive information sources (Table 6.22 & Table 6.23) that could motivate them to process the messages to which they were exposed (Petty & Cacioppo, 1986:96). High-involvement information processing occurs when an individual is motivated to acquire the information (Petty & Cacioppo, 1986:10; Antonides & Van Raaij, 1998:208; Hawkins *et al.*, 2004:353).

7.2.7.2 *Consumers' opportunity to process food additive information*

Opportunity (Figure 7.1) to process information (§ 4.4.7.3) is also a variable or factor which determines whether the central or peripheral routes to persuasion are followed (Antonides & Van Raaij, 1998:208, 210). There is less opportunity to process information when consumers experience time pressure (Antonides & Van Raaij, 1998:208; Hawkins *et al.*, 2004:488). Time is also a situational factor that can manifest itself in a number of ways (Hawkins *et al.*, 2004:488). Time constraints were indicated by participants in the present study (statements 6.9.12, 6.18.12 & 6.28.9, Tables 6.10 & 6.15).

7.2.7.3 *Food additive label reading: consumers' ability to elaborate information*

Consumers' ability (§ 4.4.7.2) to comprehend and elaborate (Figure 7.1) on food additive information is largely determined by their existing knowledge in the memory (Peter & Olson, 2008:119). Furthermore, knowledge enhances consumers' ability to understand a message

(Assael, 1995:89). Participants in the present study complained that they were unknowledgeable (statements 6.29.7-6.29.9) (statements 6.13.1-6.13.3; & 6.9.1-6.9.3) and did not know the meaning of some terminology (statements 6.14.1-6.14.6 & 6.29.10-6.29.11) and the comprehension of food additive information (statements 6.32.14-6.32.21) led to confusion (statement 6.14.7). Uninformed consumers are more likely to follow the peripheral route to persuasion (Petty & Cacioppo, 1986:8) as shown in Figure 7.1. Beliefs are formed about food additives by accumulating knowledge (beliefs) regarding relevant attributes (Figure 7.1). Finally, based on this evaluation the consumer engages in a relevant behaviour such as buying the product (Figure 7.1) (Assael, 1995:89).

7.2.8 Consumers' retention of initial perception

Consumers retain or regain their initial perception (Figure 7.1). During low involvement processing of information, the peripheral route to persuasion is followed (Figure 7.1) (Solomon, 2004:282; Peter & Olson, 2008:428). The peripheral route operates through classical conditioning (Assael, 1995:152). Consumers' attentions are focused on non food additive beliefs and perceptions toward label information and their purchasing intentions are determined by those perceptions. For example, consumers do not have time to read the food label. Thus, consumers select the product, for example, because of its yellow colour and not what is written about colourants on the label. On the other hand, in the central route to persuasion, the consumers are highly involved in the selection (Solomon, 2004:282; Peter & Olson, 2004:428) of food additive containing products. Their attention is focused (Figure 7.1), for example, on the food label, in order to search the colourant the product may contain. They think about the benefits and risks of the colourant in the food product, and more elaboration takes place. For example, they change their beliefs about a yellow product that does not contain an artificial yellow colourant but a natural colourant and will purchase it.

7.2.9 Consumers' food additive purchasing behaviour

Three significant categories of purchasing behaviour (§ 2.3.4, 6.3.3.6 & 6.3.3.8) emerged from the central route to persuasion (Figure 7.1), namely "will purchase", "will not purchase" and "selective purchase". At the same time two categories (Figure 7.1) emerged for the peripheral route to persuasion, such as "will not purchase" and "will purchase".

7.2.9.1 *Purchasing behaviour through the central route to persuasion*

Participants following the central route to persuasion used high-involvement processing with the message (stimuli), label or food additive containing product (Figure 7.1). The participants in the present study indicated their intention to buy or "will purchase" (statements 6.38.1-6.38.7) products which bears a "free", "no X added", "natural" or an ingredient "warning" claim.

The category "will not purchase" (Figure 7.1) depended on the concepts of specific health risks, children's health, additive shopper experience, product quality and uncertainty about product content (statement 6.8.7 & Table 6.19). Furthermore, "no purchase" participants indicated that they will not buy a product having E-numbers in the ingredient list (statements 6.15.1-6.15.3). Another concept that could lead to "no purchase" was when a discrepancy between the claim and the ingredient list existed, when participant's believe that a product was deceitful, and the total avoidance of products containing food additives. Reasons why participants will not buy a product bearing a food additive colourant claim, such as tartrazine, were because they wish to avoid the specific food products that contained colourants such as tartrazine (statements 6.38.9-6.38.17 & 6.37.17-6.37.19).

On the other hand, in "selective purchase", (Figure 7.1) some consumers will buy a product in the absence of the E-number or additive they want to avoid (statements 6.15.4-6.15.6). Certain types of product categories also lead to selective purchasing (statement 6.16.18). Product attributes such as possible dangers, the presence of additives and value for money indicated that participants were selective in their purchasing choices (statements 6.19.19 &

6.19.22). Only in two instances did the participants indicate that they will read a product label before deciding to purchase a product (statements 6.19.17 & 6.19.18).

7.2.9.2 *Purchasing behaviour through the peripheral route to persuasion*

Participants following the peripheral route to persuasion used low-involvement processing with the message (stimuli), label or food additive containing product (Figure 7.1). Participants in this study following the peripheral route to persuasion explained that they "will not buy/purchase" a product bearing a food additive claim such as "contain colourants" (statements 6.38.9-6.38.11) or if the participant was influenced by the media (statements 6.21.1-6.25.2 & 6.27.1).

Participants further indicated that they "will purchase" (Figure 7.1) a product which they know poses no health risk (statements 6.17.9, 6.28.13), when they were unconcerned about additives (statement 6.28.14), when the product has a good appearance (statement 6.12.2) and they buy what they always buy, in other words in the case of repeat purchases (statements 6.29.18 & 6.30.1). During low-involvement purchase (statements 6.15.7-6.15.8), the participants selected the product regardless of the presence of the E-numbers or additives they wanted to avoid due to a time constraints. The time constraints (Tables 6.9, Table 6.10 and Table 6.15) (§ 7.6.6.2) have a substantial impact on the consumer decision-making process (Hawkins *et al.*, 2004:488).

7.3 SYNOPSIS

The researcher applied the proposed Elaboration Likelihood Model on consumer perceptions of food additives in order to explain information processing and consequent purchasing of a selected sample of South African consumers. The various steps in the conceptual framework to comprehend consumers' perceptions about food additives were linked to the results of the empirical study. The steps included exposure to persuasive communication or problem recognition and awareness of food additives, 12 blocking mechanisms influencing the

purchasing decision, information search, the reception of food additive claims and the ingredient list and coping strategies used by participants. The results indicated that coping strategies led to an extended information search resulting in the feedback loop to information search. Thereafter, the consumer follows either the peripheral or central route to persuasion during information processing. Moreover, information processing is influenced by participants' motivation, opportunity and ability to elaborate on the message content.

Thereafter, the participants could follow either the central or the peripheral route to persuasion. The route which the participant chose to follow depended on their involvement, comprehension and their ability to process the information provided. All of the above-mentioned steps were shaped by the individual's perception after passing through the individual's perceptual filter. The outcome of the central route to persuasion with highly involved participants led to "will purchase", "will not purchase" and "selective purchasing". On the other hand, the outcome of the peripheral route to persuasion with low-involvement participants led to "will purchase" and "will not purchase". More elaboration took place with the central route than with the peripheral route to persuasion.

The next chapter will provide the conclusions regarding the accomplishment of the objectives and empirical findings of the study. Moreover, the possible implications of this study for the food industry, educators and regulators are indicated. Attention is drawn to the limitations and the significance of research procedures. Recommendations are presented and the researcher makes suggestions regarding future research that can be undertaken.

CHAPTER 8

CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

Chapter 7 discussed the research findings and a model of consumer perceptions about food additives and consequent purchasing behaviour was applied. This chapter provides conclusions regarding the accomplishment of the research objectives and empirical findings of this study. Furthermore, it indicates possible implications of this research for consumers, consumer educators, food legislators, food marketers and food retailers. Attention is also drawn to the limitations and the significance of certain aspects in the study. Recommendations for future research are presented at the end of this chapter.

It was important to understand consumers' perceptions and purchasing behaviour so as to implement consumer-orientated label development. There is currently a lack of such data in South Africa. Within the scope of Chapter 1, one primary objective (§ 1.3.1) and six secondary objectives (§ 1.3.2) were identified for this study. Having examined various aspects related to the consumers perceptions of food additives and the labelling thereof, it was possible to determine whether the objectives were achieved.

The secondary objectives were important towards supporting the achievement of the primary objective. The first secondary objective, namely to apply the ELM on consumer perceptions of food additives in order to explain consumer information processing and consequent purchasing was achieved by applying the ELM to consumers' food additive perceptions as discussed in Chapters 4 and 7. The researcher concluded that the ELM of persuasion was a model that could be used to investigate the way perceived information of food additives was processed from a consumer viewpoint.

To achieve the second secondary objective of determining the consumers' awareness of food additives, awareness questionnaires were used to determine unprompted and prompted awareness of the participants regarding food additives. This was followed by focus group

discussions. The first part of the focus group guide (questions 1-7) prompted participants to speak freely about their perceptions about food additives (Chapter 2, § 2.1, 2.14.5 & 3.2). Nevertheless, more information regarding participant awareness about food additives were also obtained. The focus group guide (question 8-9) led the participants to reveal their perceptions about the various sources of information about food additives they utilised, thereby secondary objective three to determine the effectiveness of sources which expose consumers to food additive information with specific reference to the role of the health information media, regulator and manufacturers of food was achieved (Chapter 2 & 3, § 3.3 2.12 & 2.14.1).

The fourth secondary objective namely to determine to which extent consumer's information search of food additive information influences the purchasing behaviour of food products with regard to food safety and quality (Chapter 2 § 2.7-2.9) was achieved using the focus group guide (question 10). Here participants explained the influence of food additive information on their purchasing decisions. The last secondary objective to determine how the reception of additive information influences the purchasing behaviour of consumers by exploring food additive claims and the ingredient contents list on food products was successfully accomplished by using the focus group guide (question 11-15) (Chapter 2 & 3 § 2.14 3.3 & 3.4). In this case participants disclosed their food additive label reading behaviour and indicated their perception about the labels available in the South African market.

The literature review of Chapters 2, 3 and the proposed model (Figure 4.1) coupled with the empirical findings (Chapter 6) led to the development of conceptual framework of reference describing the phenomenon of consumers' perceptions about food additives through the eyes of consumers. With the application of the model (Figure 7.1) of consumers' perceptions of food additives and consequent purchasing behaviour, the primary objective was accomplished.

8.2 FINDINGS OF THE STUDY

Qualitative content analysis of the focus group discussions resulted in the identification of 33 subtle underlying themes raised during the discussions about food additives and labelling perceptions. The themes yielded valuable information about the nature of participants' concerns, motivations and perceptions.

The main findings of the study were that the participants' general perceptions suggested that food additives can be defined as the addition of chemical substances that hold some benefits and/or risks to the consumer and is influenced by the situational factors related to each specific consumer. Moreover, tartrazine, MSG and aspartame were more on "top of mind" than any other food additive. The concepts of lack of information, lack of knowledge, lack of understanding and feelings of confusion were found in many areas of food additive and it's labelling. Participants also identified a variety of concerns about food additives such as cancer, allergies, asthma and hyperactivity. Specific health risks, product quality and uncertainty about product content led to no purchase. Participants were either disinterested in labels because they were in the habit of purchasing the particular product or they had previous positive experiences with the particular product, rendering the use of labels unnecessary. Furthermore, ingredient information was used the most when purchasing products for the first time.

Twelve blocking mechanisms influencing food additive information search and purchasing behaviour emerged from the focus group data. The blocking mechanisms included: lack of standardisation of terminology on food labels, illegible ingredient listing on labels, lack of food control and regulations, incorrect or untrustworthy information, insufficient information, information-overload, uncomprehensive information, increase in product price due to more information, manufacturer dishonesty, distrust in local produce, uncertainty about the expected outcome of additives and time constraints.

In the present study the participants indicated the coping strategies they use to reduce their concerns. They included the need for more legal control, government and private laboratory tests, completely avoiding products containing specific types of additives or E-numbers,

limiting the use of food additives and E-numbers, avoiding all known types of additives, searching for more information to facilitate avoidance, reading the food label, trusting endorsements and a need for research. In contrast, some participants indicated that it was impossible to avoid or limit the intake of food additives thereby indicating their resignation with the issue. On the other hand, some participants were unconcerned about the consumption of food additives, even though these participants claimed to be food additive label readers, and many indicated that they were unaffected by food additives, except for a specific few they try to avoid.

Participants indicated their intention to buy products which bear a "free", "no X added", "natural" or an ingredient "warning" claim. The total avoidance of products containing food additives leads to "no purchase". The route which the participant chose to follow depended on their involvement, comprehension and their ability to process the information provided. The outcome of the central route to persuasion with highly involved participants led to "will purchase", "will not purchase" and "selective purchasing". On the other hand, the outcome of the peripheral route to persuasion with low-involvement participants led to "will purchase" and "will not purchase". More elaboration took place in the central route than in the peripheral route to persuasion.

8.3 CONCLUSIONS

This research provided in-depth information on participants' awareness, perceptions knowledge and use of food additive labelling. Food additives were discussed from a consumers' perspective which indicated how perception influences the way consumers behave when purchasing food products containing additives. Perceptions and beliefs are shaped by knowledge, which in turn is a product of exposure to information sources and personal effort in obtaining information.

To comprehend the results of this study the researcher applied them to the ELM. The development of a content specific conceptual framework illustrated the importance of food additive perceptions and how it influenced purchasing behaviour of the participants in the

present study. The ELM highlights the importance in developing persuasive communications of anticipating how much elaboration is likely to occur during message processing. If elaboration is likely to be high, then more emphasis on including compelling arguments that support the advocated position is appropriate. When this is not the case, other techniques less dependent on the degree of message processing may be desirable. Consumers possess the motivation to use food additive label information but lack the ability to do so. The low levels of food additive knowledge that were observed in this study represent the failure of the media and food manufacturers whose promotional campaigns and materials have been misleading and often silent on the additive contents of products.

Though qualitative, the researcher identified a number of issues and pointed to some surprising conclusions, which make it an important contribution to the current debate about the role of food labelling and the changes proposed in the new draft labelling regulation in South Africa. Different blocking mechanisms prevent participants from using the food additive labels. All these blocking mechanisms can be controlled and prevented, for example, by improvement of current regulation, educating consumers about food additives from an early age and by standardising the terms on food labels. The results of the study also identified the coping or risk reducing strategies used by consumers to overcome these blocking mechanisms. The study's findings suggest that there is a need for food product labels which more fully reflect consumer's needs especially for food additives. The equalisation of different perspectives about label design and content should be negotiated. Groups of consumers are likely to interpret food labels in different ways according to specific type of concerns about food and health they have.

Some participants may not have the time or motivation to consider the ingredient list and may solely rely on the food additive claim for preventative purchasing. If so, then the potential misleading effects of the food additive claim are particularly problematic. The food additive claim may produce unwarranted inferences on related and unrelated attributes that are not corrected by the food additive ingredient disclosure. Should manufacturers and processors fail to provide clearer, more standardised food additive information on labels, consumers will rely on simple peripheral cues, for example, strong visual labels based on association with prior

beliefs of inferences, or use source effects such as word-of-mouth, to make purchasing decisions.

The label is, therefore, an important purveyor of information in the consumer's decision-making process. Rectifying deficiencies in labelling would help to address consumer concerns. Understanding the framework within which individuals' process information will enable both food scientists and consumers to obtain a deeper understanding of the way people are influenced when they are presented with foods.

8.4 RECOMMENDATIONS

8.4.1 Practical implications of the results for consumers

Information and education, including product labelling are necessary but insufficient in the prevention of diseases and the promotion of health on its own. Much of the information concerning food additives is obtained and edited by government agencies, but the dissemination of this information to consumers is not always carried out in the best way. Food processors and scientists should convey science-based information to consumers describing the potential benefits and risks of food additives. Information presented through multiple channels by means of trusted information sources increases consumer perception of information reliability. Focus group research acquaints the researcher with how the consumers speak about risks and what messages most effectively address concerns. Furthermore, by acknowledging the consumer's concerns, experts foster public trust and enhance their credibility.

Understanding consumers' perceptions of food additive information provided on food labels is required in designing food labelling regulations. Moreover, by improving public health though the provision of information can reduce medical and other costs and at the same enhance the profitability of the food industry. To improve the benefits of food labelling policies and the draft legislation of SA, effectively designed information format and disclosure are important. Possible ways to enable consumers to use label information could include information, education and practice.

8.4.2 The field of education

The findings from the study could form the basis for a mass population approach for future information and education strategies for health professionals and other stakeholders interested in educational activities regarding food additives.

A food label education programme is important in helping consumers to understand and use the label. The focus on food labelling education should not only be on nutrition information but also on food additive information. Continued and expanded label education programmes are recommended and should be included in the South African school syllabi, provided that teachers are trained to facilitate such learning materials. Greater education on food ingredients and labelling is a requirement and the pressure is on food manufacturers and packaging companies to simplify the messages and garner greater trust among consumers regarding their product claims.

One way to improve the current situation could be the use of health care organisations and audiovisual media to give objective reports concerning current scientific information about the composition and safety of food items. Authorities and organisations actively disseminating information about food should be able to convince consumers of the safety of major food additives in the diet and indicate concern only when warranted. Clearly, if consumers are to utilise information on food labels, there is a need for a major education effort to enable them to appreciate the significance of what they read.

Blanchfield (2000:xi) and Hunt (2000:15) argue that it is, however, difficult to see how the label can be the education medium. This needs to be provided by other means and through other trustworthy media (such as the DOH or Universities) or food additive information sources such as food additive booklets, Internet sites and school syllabi.

8.4.3 The field of legislation

The need to give consumers clear and authoritative information about food in order to make informed choices about their own diet should be recognised by the legislative authorities of

SA. Consumers have the right to be properly informed about the content and compositional quality of the food they purchase, and to be confident that they will not be misled as a result of inadequate, inaccurate or fraudulent information.

Many terms used on food labels are not properly defined and are, therefore, open to interpretation. Both manufacturers and consumers will benefit when rules (both statutory and voluntary) are put into a guide for good labelling. The guide should address the issues identified by consumers in this research project, including consumers' needs for transparency, credibility and clear definitions. The DOH in South Africa should consider a continuum of labelling requirements for the disclosure of all ingredients and food additives with special attention paid to substances that can cause adverse health problems.

At minimum all ingredients and additives should be clearly disclosed. The government should also endeavour to advise consumers of the presence of processing aids, accidental contaminants and other substances that are capable of causing adverse reactions. Ideally, additives that can cause serious reactions should be banned. In cases where ingredients or additives are considered essential, but can cause severe or life threatening reactions, labels should include appropriate cautionary statements. In summary, a comprehensive framework for ingredient disclosure requirements would provide peace of mind to individuals who suffer from food allergies or other sensitivities, reducing healthcare costs and possibly save lives. The DOH should adopt a comprehensive regulatory scheme for disclosing such information in a consistent manner.

This study was, therefore, important because it shed light on consumer's perception of food additive labelling that can be used by the South African label regulators to establish regulation that takes into account the views, needs and wants of the South African consumer. The knowledge about standpoints towards food additive is of importance and as such gives the authorities and decision makers in the field of foodstuff administration and regulation an idea of what knowledge the general public lacks with regard to the use of additives and the regulation system in society. On the societal level the aim is to alleviate unnecessary anxieties about additives.

8.4.4 The field of food marketing

Regardless of the fact that this study was conducted from a consumer sciences perspective, the implications for retailers are noteworthy. It is internationally an accepted fact that food labelling contributes to nutritional guidance and that many food companies use this strategy as a marketing tool. Sales people could be a good source of information and it is recommended that retailers should focus on the training of relevant sales people about food additives. Inadequate training of sales people was confirmed in a personal communication of the researcher with the manager of a retail store situated in Vereeniging.

Food suppliers and their advertisers use a range of attributes in the combination of colour, designs, shapes, symbols and messages, all engineered to attract and sustain attention in order to help consumers identify the images presented. The messages of advance publicity and advertising which stimulates the awareness of the consumer should be consistent with the messages which are received and processed at the time of purchase of the product. There appears to be a case for good informative labelling to enhance the overall "quality" of food products given that the "label" is important as a purveyor of information in the consumer's decision-making process. Thus the change of the unethical use of product labelling by some producers and manufacturers in the food industry makes good marketing sense.

Although the perceptions of consumers regarding food additives can also be taken into account in developing marketing strategies by producers, food marketers and retailers, the results of this study should be interpreted with caution. The main objective of this study was to explore consumers' perceptions about food additives and additive labeling. The results could be used to design a national questionnaire which could in turn lead to the development of marketing strategies. In addition, the results could also assist retailers to be aware of good labelling practices in their own-label pre-packed foods. A call centre is an information source that provides information and advice to consumers. A call centre for food additives can be situated anywhere in the world, thus various food marketers, retailers and even governments could work together to establish such a call centre to the advantage of consumers. Furthermore, the training of food related call centre personnel should be based on sound scientific information about foods and food additives is, therefore, of utmost importance.

The food label does not contain any explanations of food additives and does not provide the necessary direction to where consumers might find more food additive information. It is suggested that media such as websites, peel-off labels with additional information and reference booklets can be implemented. Alongside every claim or logo, the manufacturer should give the consumer details of where to find more information about the labelling scheme. The printing of more information about food additives at the back of the peel-off or see through labels is suggested by the researcher. The packaging industry could do research about label space in order to facilitate more information and to design labels that cost less.

Food manufactures and advertisers could also apply the results and the model in the technical design of more effective, understandable, user friendly food labels in terms of food additives and food additive claims. Due to the limitations of this study (§ 1.8) it is recommended that the findings of this study should be further exploited through marketing research before such strategies are implemented. This could be done through a national survey, by applying the findings of this study in the design of such a questionnaire. Demographic variables of the respondents should also form part of such a survey. It is recommended that food manufacturers and advertisers should appoint or consult consumer scientists for assistance in the application and use of food information on labels.

The researcher suggests that the long established consumer perceptions about preservatives, colourants, flavourants and emulsifiers should be taken into account in label designs. It is equally true, but less often noted, that consumers differ in preferences for particular food additives because of heterogeneity of consumers' health problems, lifestyles and taste. Although heterogeneity was not taken into account in the design of this study, it should be part of the methodology of a national study investigating South African consumers' perceptions about food additive labeling. This heterogeneity may provide the basis for market segmentation and the development of products with optimal food additive profiles for identified preference segments.

8.4.5 Further research

It is recommended that a package research survey exploring consumers' ability to used food additive claims and ingredient list information should be done. Gaps in consumers' knowledge and abilities to utilise food additive information provided on food labels could be identified. This could assist in the development of consumer education programmes from the viewpoint of consumers, thereby eliminating bias in progammes which represents only the views of health educators and scientists.

This study described a smaller sample of urban consumers within the South African context. It is, however, recommended that future studies should enlarge the sample and that the study be expanded into a quantitative survey that provides more representative data on a larger segment of the South African food additive label reading population. Such a study can benefit from the initial findings produced in this study, by using them as a starting point for the conceptualisation and identifications of relevant constructs.

Given the lack of actual behavioural purchasing data for South African consumers, research that addresses consumers search process in terms of the use of claims and ingredient lists about food additives information and actual purchasing behaviour in retail settings would provide a useful extension to these findings. Future studies should also focus on barriers and coping or risk reduction strategies to additive use and help to determine how they can be made useful for a larger proportion of the population. More work needs to be done to make food labels a useful tool for consumers and more specifically to motivate them to read the information.

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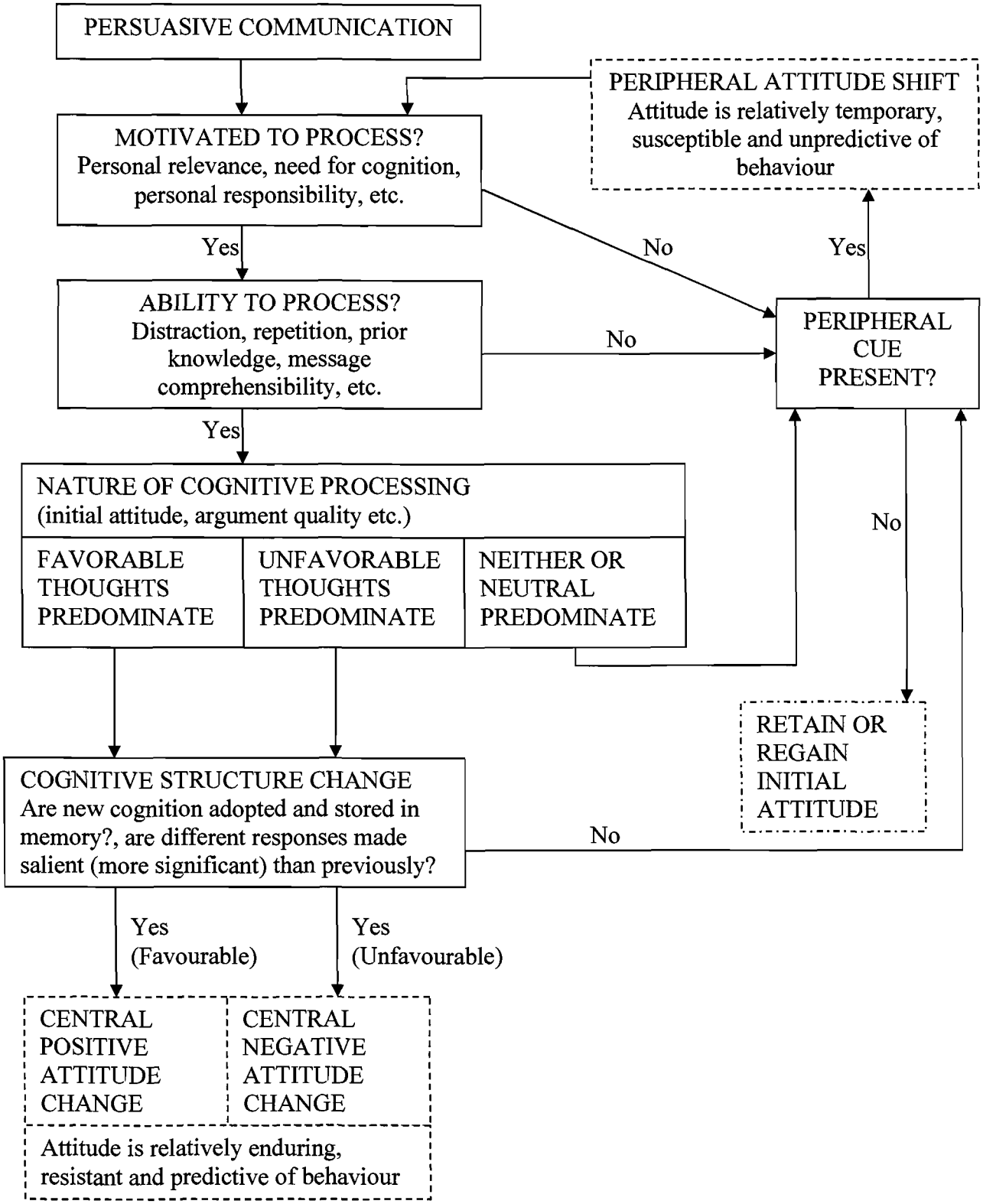
Elaboration likelihood model (Petty & Cacioppo, 1986:4)



Ethic approval

YUNIBESITI YA BOKONE-BOPHIRIMA
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Annexure B

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Dr EL Kempen
Bussie 69
NWU (Potchefstroomkampus)

30 Augustus 2004

Geagte dr Kempen

GOEDKEURING VIR NAVORSINGSPROJEK MET MENSE (KWALITATIEWE NAVORSING)

Hiermee wens ek u in kennis te stel dat u projek getiteld

"Etiketteringsgedrag van die Suid-Afrikaanse verbruiker, die verbruiker se persepsie, gebruik, kennis, houding en kognitiewe betekenis met betrekking tot inligtingsetikette, voedseladditiewe, fortifisering, kitskos, babaformules en tekstielprodukte"

op 30 Augustus 2004 goedgekeur is met nommer 04K11. Gebruik asseblief laasgenoemde nommer in alle korrespondensie rakende bogenoemde projek en let daarop dat daar van projekleiers verwag word om jaarliks in Junie op die voorgeskrewe vorm (wat voorsien sal word) aan die Etiekkomitee verslag te doen insake etiese aspekte van hulle projekte asook van publikasies wat daaruit voortgespruit het.

Goedkeuring van die Etiekkomitee is vir 'n termyn van hoogstens 5 jaar geldig (volgens Senaatsbesluit van 4 November 1992, art 9.13.2). Vir die voortsetting van projekte na verstryking van hierdie tydperk moet opnuut goedkeuring verkry word.

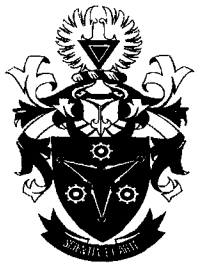
Die Etiekkomitee wens u alle voorspoed met u werk toe.

Vriendelike groete

ESTELLE LE ROUX
NAMENS SEKRETARIAAT

Annexure

POTCHEFSTROOMKAMPUS
Privaatsak X6001, Potchefstroom, Suid-Afrika, 2520
Tel: (018) 299-1111 • Faks: (018) 299-2799
Internet: http://www.nwu.ac.za



and

Vaal University of Technology

Dear Shop Manager 2005/06/23

In resent times we as consumers have become more discerning about the food which we eat and more sophisticated in our shopping habits. We require more information than ever before, so as to make informed choices about the products we purchase. For example, we may wish to avoid certain foods for health reasons, or choose our food on environmental and ethical grounds.

Food labelling is now an accepted method for providing consumers with the information needed in order to make informed choices when purchasing food. It is recognised that it is sometimes impractical to include every piece of desirable information on a label due to factors such as packaging size and costs. On the other hand consumers need information for a variety of reasons. New developments in the food supply chain, in particular the consumers' perception and expectations, justify a review of issues. Coupled with the growing consumer demand for additional information is the need for clarification of some of the existing information on food labels. Not surprisingly, the occurrences of a number of "food scares" and other incidents connected with the food manufacturing industry have undermined consumers' confidence. Consumers are increasingly concerned about the health and safety impacts of the food products they consume. What are the current consumer concerns and perceptions of food additives? Much of the evidence in the literature suggested that consumers have difficulties in finding, reading and understanding information on food labels. Clearly, the food additives listed on food package can be confusing to consumers. Although the SA food law requires all food additives to be listed on the food labels, some manufactures do not comply with this legislation.

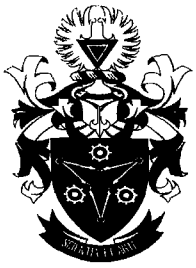
The objective of this study is to explore the consumers' perceptions of food additives and how it influences consequent purchasing behaviour. The perceptions of consumers regarding food additives can be taken into account in developing marketing strategies by producers, food marketers and retailers. Results could also assist retailers to be aware of good labelling practices in their own-label pre-packed foods. The findings of this study could form the basis for a mass population approach for future information and education strategies for heath professionals and other stakeholders interested in educational activities regarding food additives.

The researchers are a group of students and a Lecturer from the Vaal University of Technology in Vanderbijlpark. The students are busy with their BTech Food and Beverage Management Studies and one of the projects that needs to be completed includes consumer research. The lecturer is busy with her PhD Consumer Sciences at the North-West University Potchefstroom. The project will be done under the supervision of Dr. E. Kempen and Dr. D. Van der Merwe from the North-West University School of Physiology, Nutrition and Consumer Sciences.

We would like to ask your permission to approach/recruit consumers in your Supermarket. Only four short questions will be asked in your supermarket about their food label reading habits. Interested consumers will be invited to a focus group session to be held at a later stage at a different venue.

Your assistance would be appreciated.
Thank you

Research group: Emsie Dicks, Madeleen du Plessis, Salomi Ströh, Bernard van der Westhuizen
Emsie Dicks
Lecturer: Food
Department of Hospitality and Tourism
Vaal University of Technology Tel:016 950 9460



and

Vaal University of Technology

Dear Parent

We are students doing research on the consumers' perception of food colourants and flavourants and their knowledge about them.

1. Are you mainly responsible for the household food shopping?
2. Does any one in your household have any special health-related food needs that you have to consider when buying food? This could be a food allergy, colourant sensitivity, medical conditions such as diabetes, food sensitivity, thyroid problems, attention deficit hyperactivity disorder, hyperactive child, asthma or medical advice to reduce intake of any ingredient. It can be your child or someone in the family.
3. Do you look or search for food flavourings and colourants information on a food product label?

Your participation in the focus group discussion on food additives and labelling will be appreciated.

To participate in the consumer study please:

1. Leave your name and number at the school on the list provided **or**
2. Contact one of the persons listed below.

We would stress that we are not selling anything and are only interested in your opinion as a consumer or caring parent. Here is an opportunity for you to make a difference in the current labelling legislation in SA as the results will be communicated at conferences and published in various journals. The results of the discussion groups will be used for research purposes only and will be delivered at international congresses and published in academic journals. We

do this project as part of a lager study in collaboration with the Department of Physiology, Nutrition and Consumer Sciences of the North-West University in Potchefstroom. All information will be confidential. Discussions will be held at various places on different times.

Enjoy something to eat and drink with us afterwards. Thank you for your willingness to participate in a consumer research study.

Kind regards

Contact persons:

Emsie Dicks (082 855 2237), Madeleen du Plessis (083 452 9420) or Salomi Ströh (083 501 4404).

YUNIBESITI YA BOKONE-BOPHIRIMA
NORTH-WEST UNIVERSITY
NOORDWES-UNIVERSITEIT

en **Vaal University Of Technology**

TITEL VAN NAVORSINGSPROJEK

Suid Afrikaanse verbruikers se persepsies aangaande voedseladditiewe en etikettering

Geagte Mnr/Mev/Mej Datum: ...../...../2005

DOEL EN AARD VAN DIE STUDIE

Die doel van hierdie navorsingsprojek is om verbruikers se begrip van, asook idees en opinies oor voedseladditiewe en die ettikettering daarvan te ondersoek. Die studie maak gebruik van gespreksgroepe om hierdie inligting van verbruikers wat voedseletikette lees, in te win. Aangesien wetgewing aangaande etikettering tans ondersoek word, is dit daarom belangrik om die verbruiker se idee oor voedseladditiewe en etikettering daarvan aan te hoor omdat die tipe inligting sowel as dit wat vir die verbruiker belangrik is, ondersoek moet word om sinvolle aanbevelings oor voedseladditiefetikettering te kan maak.

PROSEDURE VIR DIE NAVORSING

1. Die studie vereis dat u aan n gespreksgroep (fokusgroep) oor voedselprodukte deelneem.
2. Die gesprek word gelei deur 'n fasiliteerder.
3. Die groepgesprek is 'n geleentheid waar u, u eie mening kan lig oor voeseladditiewe en die etikettering daarvan.
4. Daar is geen regte of verkeerde antwoorde nie.
5. U hoef niks voor te berei vir die gesprek nie.
6. Almal in die gesprekgroep sal 'n geleentheid gegun word om hul mening te lig, ander gespreksgroeplede se opinie te beaam of teen te gaan. Die groep mag die mening en opinies van ander gesprekgroepslede debatteer.

VERWITTIG VAN BANDOPNAME

U word bewus gemaak van die fiet dat die gespreksgroep op band opgeneem sal word om te verseker dat waardevolle inligting wat deur die gespreksgroep gelewer word nie verlore sal gaan nie en die konteks van die inligting deeglik nagegaan kan word. Na afloop van die gesprekgroep sal die kasette getranskribeer word. U is enige tyd geregtig daarop om die teks van u gesprekgroep deur te gaan.

VERKLARING VAN KONFIDENSIALITEIT

Die gespreksgroep se menings word as streng vertroulik beskou en slegs lede van die navorsingspan sal toegang tot inligting hê. Geen data wat in skripsies/verhandelinge en joernale gepubliseer sal word sal eninge inligting bevat wat die gespreksgroeplid sal identifiseer nie. U anonimiteit word dus versker.

ONTREKKINGKLOUSULE

Ek verstaan dat ek ter enige tyd aan die gespreksgroep mag onttrek. Ek neem dus vrywillig deel totdat ek anders versoek.

MOONTLIKE VOORDELE VAN DIE STUDIE

Deur verbruikers se menings en opinies aangaande voedseletikettering in te win, sal meer doeltreffende aanbevelings gemaak kan word wat die etikettering van voedselprodukte sodanig kan beïnvloed dat die verbruiker daaruit voordeel sal trek. Dit sal verbruikers dus instaat stel om op grond van voedseladditiewe, ingeligte en beter besluite aangaande die aankoop van voedselprodukte te neem. Hierdie studie kan ook verder lei to verbruikersopvoedingsprogramme waarin die verbruiker se behoeftes ten opsigte van voeseletikettering aangespreek kan word.

Deelnemers sal na afloop van die gespreksgroepe met iets te drinke en 'n stukkie koek beloon word.

INLIGTING

Indien ek eninge vrae oor die betrokker studie het, mag ek met die projekleier, Dr. Elizabeth Kempen kontak maak (Tel: 018 299 2483)

VERKLARING VAN TOESTEMMING VERLEEN

Ek, die ondergetekende _____ (volle name) het die voorafgaande gewens in verband met die projek gelees en ook die modelinge weergawe daarvan aangehoor en ek verklaar dat ek verstaan. Ek was die geleentheid gegun om tersaaklike aspekte van die projek met die projekleier te bespreek en verklaar hiermee dat ek vrywillig aan die projek deelneem. Ek gee hiermee my toestemming om as deelnemer in die bogenoemde projek op te tree.

Ek vrywaar hiermee die twee Universiteite asook enige werknemer of student van die Universiteite, teen enige aanspreeklikheid wat teenoor my, in die loop van die projek mag ontstaan.

Ek onderneem veder om geen eise teen die bogenoemde Univesiteite in te stel weens skade of persoonlikheidsnadeel wat ek weens die projek/proef of die toedoen van ander proefpersone mag ly nie, tensy dit aan die nalatigheid van die Universiteite, sy werknemers of studente te wyte is.

Ek het 'n getekende kopie van hierdie toestemmingooreenkoms ontvang.

Hantekening van deelnemer: _____

Onderteken te _____ op _____

GETUIES **DATUM**

1. _____ _____

2. _____ _____

FOOD ADDITIVE PERCEPTION STUDY

Recruitment screening criteria

Introduction

Good (**Morning/evening/afternoon**). My name is ..... from the Vaal University of Technology in Vanderbjilpark. We are conducting a research project together with the North-West University in Potchefstroom. We are gathering a small group of people to talk about different food products and shopping behaviour. May I speak to you for a moment?

Screening

1. Are you mainly responsible for the household food shopping? **YES / NO** (if no close interview)
2. Do you read the labels on food products? **YES / NO**
3. Does any one in your household have any special health-related food needs that you have to consider when buying food? This could be a food allergy, medical condition such as diabetes, food sensitivity, thyroid problems, hyperactive child, asthma or medical advice to reduce intake of any ingredient. It can be you or someone in the family. **YES / NO**
4. Do you look or search for food additives/colourants/flavourant information on a food product label? **YES / NO**
   (if no thank the participant and close interview)

Proceed to recruitment speech

We are having a discussion group amongst people like yourself about food products. It will last up to one and a half hour and light refreshments will be provided. Your participation will be appreciated as you as consumer can forward your viewpoint. Would you like to take part? **YES/ NO** (if no close interview)

We would stress that we are not selling anything and are only interested in your opinion. The results the discussion groups will be used for research purposes only and will be delivered at

international congresses and published in academic journals. We do this project as part of a lager study in collaboration with the Department of Consumer Science of the North-West University in Potchefstroom. All information will be confidential. Discussions will be held at various places on different times. Which of these will be the most suitable for you to attend? **(Select one of group cards)**

If the respondent refuses, or is unavailable, thank politely and close interview.

Participant information

Group...../.....June/July 2005

Time: 1 / 2 **Place:**

1(K) / 2(M)

If respondent are willing participate in the project please provide use with the following information:

Name and Surname: .....

Street address:.....

Suburb:.....

Phone: (h).....

(w):.....

(Cell):.....

I certify that this is a true and accurate and complete interview, conducted in accordance with the permission provided by the Ethics Committee of the North-West University. I will not disclose to any other person the content of this questionnaire or any other information relating to the subject.

Thank you.

Written task 1 (5 minutes)

I have mentioned that the topic for today is food additives listed in the ingredient list on labels of processed food products.

1. Using the sheet in front of you, please write down all the additives including colourants and flavourings you can think of. Write them down in the first column as they come to mind. That is ones that you have seen in the supermarket, or used to select a product yourself. In the opposite column write the food product name you have seen it on. If you cannot remember a product name on which you have seen the additive, leave the space open.

Additive	**Product**

2. Do you know what a food additive claim is?

Yes	No

If yes, please describe it to us.

_____

_____

_____

Please hand in the sheet and proceed to written task 2.

Written task 2 (10 minutes)

Mrs. Lee is purchasing food for her child who is allergic to tartrazine in a Supermarket. She wants to buy orange juice for her child. She decided to look at the ingredient list to make a choice of which orange juice will be the best to buy.

Orange juice one

Water, orange juice, acidifier (E296) sodium cyclamate (E952) & sodium saccharine (E954) (non-nutritive sweeteners), stabilisers (E440 & E405), clouding agent (E414), flavourants (E1518 & E1520), sodium benzoate (E211), and Sulphur dioxide (E223) (preservatives) colourants E160a & E110)

Orange juice two

Water, sugar, orange juice, ascorbic acid (E296), flavourant, colourants (E104, E110) Sulphur dioxide (E223) benzoic acid (E211) (preservatives) Tartrazine free

Orange juice three

Orange juice with orange cells, vitamin C, preservative: Pimaricin.

Orange juice four

Water, acidifier, sodium cyclamate, sodium saccharine (non-nutritive sweeteners), cloudifier, flavourants, sodium citrate, colourants including tartrazine, benzoic acid (preservatives)

Questions

Please keep in mind that even if you do not use, like or buy any of the above products, you still need to advise Mrs. Lee.

1. Mrs. Lee wants her child to test the taste of two of the four orange juices. Carefully study the provided ingredients list. Which two do you think must she select?

a)_____

Please give reasons your choice.

_____

b)_____

Please give reasons your choice.

_____

2. List all the additives used in orange juice three.

_____

Please hand in your answer sheet.

Focus group session guide for the consumers' perceptions of food additive study (Main study)

1. Registration

The participants are welcomed on arrival and complete the consent form to be recorded during the session. Each participant receives a name tag.

2. Welcome (5 minutes)

As a group of researchers we welcome you to this focus group discussion session. I am Emsie Dicks, the principal researcher of this study. I am a lecturer in Foods at the Vaal University of Technology and a PhD student at the North-West University. I would like to introduce Madeleen du Plessis, Salome Ströh and Bernard van der Westhuizen, three of my students who are studying BTech Food and Beverage Management at the Vaal University of Technology. All three of them do research in this field.

You have been asked to participate in this study, and we thank you for your willingness to do so. All of you are consumers using a wide array of food products. In this discussion session we would like to obtain your viewpoints on food additives used by the food manufacturing industry and on the information pertaining to these additives that is printed on the labels of products we consume every day.

We shall do both written activities and discussions. During this session we shall record your opinions on video/tape, and take down notes. According to the ethics of this research all information you provide will be treated as confidential as indicated to you on the day you agreed to participate in this study. Please make sure that you have completed the declaration form.

We are interested in your own opinions and there are no right or wrong answers or any hidden agendas. The only rule is that only one person should speak at a time. Please switch off your

cell phone for the duration of the discussion session. The bathroom is located ... (Give directions.)

3. Round table introduction (5 minutes)

Please introduce yourself to the group by giving your name, and tell us what your favourite food is and why. Let us start on my right-hand side.

4. Discussion (50 minutes)

4.1 Awareness scenario (15 minutes)

Unprompted awareness: Written task 1 [Handout sheet 1]

Prompted awareness: Written task 2 [Handout sheet 2]

Please read through the scenario in the folder and answer the questions.

4.2 Focus groups (30 minutes)

4.2.1 Food additives

Question 1

What is your general idea about food additives? Explain why you think so.

Wat is u algemene idee van voedselbyvoegsels/-additiewe en gee redes hoekom u so dink.

Question 2

Why do manufacturers use food additives in their products? Explain your answer. For what other reasons? Give reasons and provide examples.

Waarom gebruik vervaardigers byvoegels/additiewe? Verduidelik u antwoord. Verduidelik en gee voorbeelde.

Question 3

What do you think the E-numbers listed in ingredients lists mean? How do these numbers influence your purchasing decision?

Wat dink u is die betekenis van die E-nommers wat in bestanddelelyste gebruik word? Hoe beïnvloed dit u aankoopbesluit?

4.2.2 Food additives and safety/concerns/risks/quality

Question 4

What aspects of food additives concern you? Explain why you feel this way.

What is dit omtrent voedselbyvoegsels/additiewe wat u bekommer? Verduidelik hoekom u so voel.

Question 5

What are the risks involved in consuming food additives?

Wat is die risiko's verbonde aan die gebruik van voedselbyvoegsels/-additiewe?

Question 6

How do food additive risks influence your purchasing decision?

Hoe beïnvloed risiko's verbonde aan voedselbyvoegsels/-additiewe u aankoopbesluit?

Question 7

What do you think of the safety of food additives used in food?

What dink u van die veiligheid van voedselbyvoegsels/-additiewe in voedsel?

4.2.3 Legislation and information

Question 8

Please tell us what you know about the legislation/laws in South Africa regarding food additives.

Vertel ons asseblief wat u weet van SA wetgewing oor voedseladditiewe.

Question 9

From where do you get your information about food additives?

Waar kry u u inligting oor voedselbyvoegsels/-additiewe vandaan?

Question 10

Does the food additive information help you in your purchasing decision?

Help die inligting ten opsigte van voedselbyvoegsels/-additiewe op 'n etiket u in u aankoopbesluit?

Question 11

Does the label provide you with the information on additives you are searching for? What information do you read on a food label in terms of food additives?

Gee die etiket op 'n produk vir u die nodige inligting oor voedselbyvoegsels/-additiewe wat u soek? Watter inligting oor voedselbyvoegsels/-additiewe soek u?

4.2.4 Labelling, list of ingredients and food additive claims

Question 12

What do you think of the ingredients list on food labels?

Wat dink u van die bestanddelelys op voedseletikette?

Question 13

Do you think food manufacturers reveal enough information to the public about substances used in their food? Give reasons for your answer. How can they improve upon it?

Dink u voedselvervaardigers gee die publiek genoeg inligting oor byvoegsels wat in hulle produkte gebruik word? Waarom sê u so? Hoe kan hulle dit verbeter?

Question 14

What is a food additive claim? Give examples of such claims.

Wat is 'n additief- of voedselbyvoegsel-aanspraak ("claim")? Gee voorbeelde van sulke aansprake.

Question 15

How do food additive claims influence your purchasing decision?

Hoe beïnvloed voedselbyvoegsel-aansprake ("claims") u aankoopbesluit?

4.3 Claims scenario (10 minutes)

Study the following three labels and explain to the group what the additives, additive claims and ingredient list mean to you (Parmalat/Nutriday, Mango/stock powder, Choice orange juice). Explain how each will influence your purchasing decision.

5. Thanks and conclusion (5 minutes)

Thank you for participating in this consumer study by contributing your valuable time. The information you provided will be used to provide the food manufacturers, journalists and retailers in South Africa with the concerns, issues, problems and opinions that consumers have on the issue of food additives and the labelling thereof on food products. This can help them to improve their products and to accommodate your needs and wants. These comments will be used to shape the direction of food labelling in SA. Data will be presented in accredited scientific journals and at international conferences.

Light refreshments will now be served in the restaurant. Thank you once more that you were prepared to participate in our study.

Focus group session guide for the consumer perceptions of food additive study (Pilot Study)

1. Registration

The participants are welcomed on arrival and complete the consent form to be recorded during the session. Each participant receives a name tag.

2. Welcome (5 min)

As a group of researchers we welcome you to this focus group discussion session. I am Emsie Dicks, the principal researcher of this study. I am a lecturer in Foods at the Vaal University of Technology and a PhD student at the North-West University. I would like to introduce Madeleen du Plessis, Salome Ströh and Bernard van der Westhuizen, three of my students who are studying BTech Food and Beverage Management at the Vaal University of Technology. All three of them do research in this field.

You have been asked to participate in this study, and we thank you for your willingness to do so. All of you are consumers using a wide array of food products. In this discussion session we would like to obtain your viewpoints on food additives used by the food manufacturing industry and on the information pertaining to these additives that is printed on the labels of products we consume every day.

We shall do both written activities and discussions. During this session we shall record your opinions on video/tape, and take down notes. According to the ethics of this research all information you provide will be treated as confidential as indicated to you on the day you agreed to participate in this study. Please make sure that you have completed the declaration form.

We are interested in your own opinions and there are no right or wrong answers or any hidden agendas. The only rule is that only one person should speak at a time. Please switch off your cell phone for the duration of the discussion session. The bathroom is located ... (Give directions.)

3. Round table introduction (5 min)

Please introduce yourself to the group by giving your name, and tell us what your favourite food is and why. Let us start on my right-hand side.

4. Discussion (50min)

4.1 Awareness scenario (15min)

Unprompted awareness: Written task 1[Handout sheet 1]

Please read through the scenario in the folder and answer the questions.

Prompted awareness: Written task 2 [Handout sheet 2]

4.2 Focus groups (30min)

4.2.1 Food additives

What is you general idea about food additives? Give reasons why you think so.

Wat is u algemene idee van voedselbyvoegsels/additiewe en gee redes hoekom jy so dink.

Why do manufacturers use food additives in their products? Explain your answer. For what other reasons? Give reasons, explain, and provide examples,

Waarom gebruik vervaardigers byvoegsels/additiewe? Hoekom, verduidelik, om watter redes, gee voorbeelde.

What do you think is the meaning of the E-numbers listed in ingredients lists? How does it influence your purchasing decision?

Wat dink u is die betekenis van die E-nommers wat in bestanddelelyste gebruik word? Hoe beïnvloed dit u aankoopbesluit?

4.2.2 Food additives and safety/concerns/risks/quality

What about food additives concerns you? Give reasons, explain why.

What van voedselbyvoegsels/additiewe bekommer jou? Gee redes, verduidelik hoekom?

What do you think of the safety of food additives?

Wat dink u van die veiligheid van voedselbymidddel/additiewe?

What are the risks of food additives?

Wat is die risikos verbonde aan die gebruik van voedselbyvoegsels of additeiwe?

How do food additives influence your purchasing decision?

Hoe beïnvloed voedselbyvoegsels/additivewe you aankoopbesluit?

4.2.3 Legislation and information

Please tell us what you know about the laws in South Africa regarding food additives.

Vertel ons asb wat jy weet van SA wetgewing oor voedseladditiewe.

Where do you get your information about food additives?

Waar kry jy jou inligting oor voedseladditiewe?

Does the food additive information help you in your purchasing decision? Why?

Who told you that?

Help die voedsel additief inligting op 'n etiket you in you aankoopbesluit?

What information are you reading on a food label?

Watter inligting oor voedselbyvoegsels/additiewe lees jy?

Does the label provide you with the information on additives you are searching for?

Gee die etiket op 'n produk vir jou die nodige inligting oor additiewe wat jy soek?

4.2.4 Labelling, ingredient list and food additive claims

What do you think of the ingredient list on food products?

Wat dink jy van die bestanddelelys op voedseletikette?

Do you think food manufacturers reveal enough information to the public about substances used in their food? Why, how can they improve?

Dink jy voedselvervaardigers gee genoeg inligting vir die publiek oor byvoegsels wat in hulle produkte gebruik word? Hoekom? Hoe kan hulle dit verbeter?

What is a food additive claim? Why, give examples

Wat is 'n additief "Claim" Hoekom, gee voorbeelde

How do food additive claims influence your purchasing decision?

Hoe beïnvloed voedselbyvoegsel/additief "Claims" of aansprake jou aankoopbesluit?

4.3 Claims scenario (5 min) Sop, mango, parmalat

The last part will take about 10 minutes to complete. In your folder is the last part that you need to complete. Please read the instructions before completing Written task 3.

5. Thanks and close (5min)

Thank you for participating in this consumer study by contributing your valuable time. The information you provided will be used to provide the food manufacturers, journalists and retailers in South Africa with the concerns, issues, problems and opinions that consumers have on the issue of food additives and the labelling thereof on food products. This can help them to improve their products and to accommodate your needs and wants. These comments will be used to shape the direction of food labelling in South Africa. Data will be presented in accredited scientific journals and at international conferences. There is coffee/tea and something light to eat available in the restaurant. Thank you once more that you were prepared to participate in our study.

Literature analysis of ingredient lists for prompted awareness

Orange juice 1

Contains 12 additives, each described with their E-number.

Some additives are indicated by their chemical name, including saccharine as prescribed by law. Others are only indicated by the main function such as the acidifier, stabiliser, colouring agent, colourant and flavourant and not specific chemical names except for the preservative to facilitate easy recognition.

Ascorbic acid with incorrect E-number (296), it should be E300 but further all correctly indicated.

Does not indicate whether E160 a i (synthetic beta carotene), or E160 a ii (Natural extracts) are used. Only E160 is indicated.

Benzoates and Sunset yellow (FD&C Yellow no 6) are known allergens (Hannuksela & Haahtela, 2002:50)

Difficult to understand/distinguish that two preservatives are used.

Orange juice 2

Six additives are used, together with its chemical name and the E-numbers.

Flavourant not indicated which one is used, no chemical name or E-number provided.

Benzoates and Quinoline yellow are known allergens (Hannuksela & Haahtela, 2002:50)

Tartrazine (FD&C yellow no5) Free.(E102)

One preservative used.

Orange juice 3

Contain the least amount of additives namely Vitamin C and pimaricin.

Vitamin C is a permitted antioxidant (E300) and pimaricin an approved preservative (E235).

No water added.

Contains orange juice with cells.

Orange juice 4

No E-numbers used only chemical name of food additive.

Contains the allergic substance namely tartrazine (E102) an nine other additives.

Label indicates flavourants but did not state which and how many of each.

Contains no orange juice at all.

Discussion

Thus orange juice number three is the best. It contains one food additive and is a fresh juice with cells. Orange juice number two will be the second best. Contains fewer additives than no 1, and indicated that it is tartrazine free. Orange juice number four contains tartrazine. Number one contains many additives.