Price in the choice of fresh fruits and vegetables

A thesis submitted for the degree of Doctor of Philosophy of the University of New England.

by

Katherine Mary Owen, B. Bus. (Kuring-gai), B. Ec. Hons. (UNE)

March 1996

Declaration

I certify that the substance of this thesis has not already been submitted for any degree and is not currently being submitted for any other degree or qualification.

I certify that any help received in preparing this thesis, and all sources used, have been acknowledged in this thesis.

Abstract

Price and choice in the purchase of fruits and vegetables is an under-researched area. While the salience and role of price in choice has been studied in some depth by marketing researchers, these studies have been largely confined to various grocery-based product groups. Little attention has been given to this topic in the general product group comprising fruits and vegetables. Research which has focused on price-related issues has mainly emanated from the economics discipline and in studies conducted at the aggregate level. Yet, there are many features of fruits and vegetables which suggest that a closer examination of price in their choice may contribute to our general understanding of behaviour in response to this attribute. Fruits and vegetables are often priced differently to one another, they are subject to quality and price variability which is unrelated to competitive influences, and their constitution is such that they can provoke strong sensory responses in consumers.

The research comprising this thesis sets out to develop a comprehensive perspective of how price features in *actual* consumer choice in the purchase of fruits and vegetables. In so doing, it explores both the salience and role of price in choice. The research draws on the theory and evidence developed in the fields of economics and marketing and, where relevant, the literature of physiology.

A series of studies were conducted to identify consumers' perceptions of the product group and to ascertain their choice patterns. A multimethod approach was adopted to gain breadth as well as depth of insight into purchase behaviour. One study was based on post-purchase surveys and, the other, on the collection of verbal reports. Studies preliminary to the main research were also conducted to develop a profile of retail prices for fresh fruits and vegetables, and a questionnaire to elicit personality and behavioural characteristics of consumers.

At a broad level results of the studies indicated that latent concerns with price often do not manifest in constant price vigilance. Rather, consumers utilise global or local decision rules in which price is implicit rather than explicit. In this respect the notion of price-defined consideration sets was clearly evident in consumers' shopping strategies. Ongoing attention to price was influenced by factors such as perceived price variability of the product, the price level and required volume of products, and experience with quality variation. Where any one of these factors were high attention to price was generally greater. However, greater attention to price did not necessarily translate into price responsiveness. The activity reflected more the need to monitor certain products. This tends to support the presence of a band of 'acceptable prices' where price responsiveness lies at the threshold of the band.

These, and other, findings discussed in the thesis point to the need to review conventional thinking on consumer behaviour in both economics and marketing. Consumers are efficient shoppers but not in the manner proposed by many economic models of choice. Nor can choice of fruits and vegetables be neatly slotted into marketing theories of low-cost purchases or brand-related behaviour. The particular implications for marketing and for economics together with possible avenues for further research are outlined in the closing chapter of the thesis.

Acknowledgments

The nature of the research comprising this thesis was such that it drew on the generosity of a substantial number of individuals.

My particular thanks go to my supervisors Dr Vic Wright and Dr Garry Griffith whose persistent confidence in, and support for, my work encouraged my progress throughout the research. Their readiness to listen and provide advice when it was needed was especially helpful.

I owe a special debt of gratitude to Dr Ray Cooksey. Without his assistance the construction of the behavioural studies and their subsequent analysis would have been a far more difficult task. Thank you also to my research assistant, Geoff Bailey, whose diligence and enthusiasm I was grateful for, and to my colleagues for their general encouragement.

The research comprising this thesis could not have been undertaken but for the willingness of individuals to give their time to complete the various surveys which were developed and used in the studies. My thanks goes to all of these, and particularly to those who participated in the post-shopping survey and the study of shopping protocols. Finally, the co-operation of the management and staff at Armidale Wholesale Fruit Market was invaluable. Their readiness to allow me to approach their customers, and their genuine enthusiasm for the project, made it a pleasure to work alongside them.

A thesis is not only research but a laborious task of word processing and checking. Sue Scarrow's empathy and assistance kept me going when it all seemed too much. Alison Sheridan and Erica Klee devoted themselves to the coding of verbal reports, for which I am extremely grateful. They, and Sue-Ellen Keldjal, have been constant sources of encouragement. My mother, Margaret Owen, was infinitely patient with the difficult task of editing and checking references. The completion of this thesis will be a relief to her also.

Finally, to my family and friends, thank you for your support and patience. I promise my conversation will have greater breadth from now on.

Contents

Abstrac	ct -	iii
Acknow	wledgments	V
Content	ts	vi
Figures		xi
Tables		xiii
Chapter	r 1 - Introduction	
1.1	The problem setting	1
1.2	2 Thesis outline	5
Chapter	r 2 - Theory and evidence on the role of price in consu behaviour	mer choice
2.1	Introduction	8
2.2	Models of choice and the role of price 2.2.1 The economic theory of choice 2.2.2 Psychology-based models of choice behaviour 2.2.3 Evidence vs theory: the disciplinary approaches comp	9 10 12 ared 15
2.3	'Value' and choice 2.3.1 The budget constraint and price as 'sacrifice' 2.3.2 The price-quality trade-off 2.3.3 Transaction utility 2.3.4 An integrated view of the roles of price in value and c	17 18 21 23 hoice 24
2.4	The concept of a reference price	28
2.5	5 Full circle: the role of price in choice	31

Gna	pter	vegetables	
	3.1	Introduction	33
	3.2	Physiologies and associations 3.2.1 Consumer demographics and psychology	34 35
	3.3	Preferences for product attributes in fruits and vegetables 3.3.1 The Australian context	37 38
	3.4	Price variation in selected fruits and vegetables	44
	3.5	Summary of the issues	53
Cha	pter	4 - Price in the choice of fruits and vegetables: modifying factors	
	4.1	Introduction	55
	4.2	Product attributes and price sensitivity 4.2.1 Categories and substitution 4.2.2 Substitution and price sensitivity in fruits and vegetables	56 59 62
	4.3	Variety-seeking behaviour 4.3.1 Individual differences 4.3.2 The influence of product attributes 4.3.3 Price and variety-seeking	64 64 65 67
	4.4	Attribute / quality consistency	68
	4.5	Risk and consumers' purchasing behaviour 4.5.1 The implication of risks for the salience of price in choice 4.5.2 The interaction of price and risk	72 74 75
	4.6	Price variability and reference prices	78
	4.7	Quantity flexibility and the response to price changes	80
	4.8	Summary of the issues	80
Cha	ıpter	5 - Methods for describing consumers' purchases of fruits and vegetables	
5.1	Intro	oduction	85
	5.2	Models of consumer decision making behaviour	86
	5.3	A model of consumer choice for fruits and vegetables 5.3.1 The shopping and decision-making process	89 92

		5.3.2 The model and reality5.3.3 The model's implications for methodology	95 96
	5.4	The research design	97
	5.5	The measurement of price sensitivity and the role of price in choice	102
	5.6	The nature and conduct of verbal protocol analysis	104
	5.7	Summary of the issues	108
Cha	pter 6	6 - Consumer characteristics and their measurement	
•	6.1	Introduction	110
	6.2	Predispositions to price and budget consciousness 6.2.1 Price consciousness 6.2.2 Budget consciousness 6.2.3 Risk and price sensitivity	112 112 114 114
	6.3	Involvement 6.3.1 The measurement of involvement	115 116
•	6.4	Variety seeking	118
	6.5	Styles of information processing	119
	6.6	Additional items included in the instrument	121
	6.7	Development of the scales 6.7.1 Initial testing of questionnaire instruments 6.7.2 Second-stage development of the measures	122 124 128
	6.8	General factor characteristics and demographic profiles 6.8.1 Analyses and results	133 135
	6.9	Perceived price-quality differences in fruits and vegetables	139
	6.10	Summary and implications for the application of measures	142
Cha	pter 7	7 - Consumer attitudes and purchase behaviour in relation to fruits and vegetables	
	7.1	Introduction	144
	7.2	The survey instruments and conduct of the study 7.2.1 Usage context and quality perceptions 7.2.2 Reference prices	145 146 148 149
		7.2.3 Price related and other potential influences on price recall	149

	7.2.4 Conduct of the study	151
7.3	Data management and sample characteristics 7.3.1 Sample characteristics	153 154
7.4	Individual profiles	158
	7.4.1 Individual profiles and shopping behaviour	162
	7.4.2 Price recall	164
	7.4.3 Reference prices	168
7.5	Respondent perceptions of differences in the attributes of fruits	
	and vegetables 7.5.1 Price levels and variance	171
	7.5.1 Price levels and variance 7.5.2 Perceptions of varietal breadth	171 174
	7.5.3 Perceptions of quality consistency	176
	7.5.4 Usage contexts	178
7.6	Profiles of fruits and vegetables and respondent recall and	
	reference prices	180
	7.6.1 Respondents' price recall	182
	7.6.2 Reference price and context specific attributes	187
7.7	Summary	192
8.1	8 - From consumer perceptions to consumer behaviour Introduction	195
8.1	Introduction	195
8.2	The research method	196
	8.2.1 Articulated price and price recall and reference prices	200
	8.2.2 Conduct of the study	200
8.3	Sample characteristics	201
	8.3.1 Subjects' protocol characteristics	203
8.4	Elimination statements	212
8.5	Non-price choice processes	215
	8.5.1 Characteristics of non-price processes	217
	8.5.2 Price awareness in non-price choices8.5.3 An overview of non-price choices	223 226
0.6	1	
8.6	Price-featured choices 8.6.1 Unfavourable / unacceptable price	226 227
	8.6.2 Behaviour in response to favourable prices	234
	8.6.3 Product comparisons	238
	8.6.4 Risk and choice	243
	8.6.5 Variety-seeking behaviour	245
	8.6.6 Neutral price references	247
	8.6.7 Recall and price-based choices	249

8.7	Reference prices and other factors	252
8.8	Summary	254
Chapter	9 - Discussion and conclusions	
9.1	Introduction	255
9.2	The salience of price	257
9.3	The role of price	259
9.4	Issues of interest to marketing research 9.4.1 Price variability and variety-seeking	261 263
9.5	Issues of interest to an economic perspective	264
9.6	Measurement and method	266
	9.6.1 Price recall and consumers' price awareness	266
	9.6.2 Verbal reports and heeded information9.6.3 Measures of consumer characteristics	267 268
9.7	Avenues for further research	270
9.8	The final summary	271b
7.0	The mar bunning	2.10
Reference	ces	272
Appendi		289
	6.1: Items for inclusion in the initial questionnaire instrument	289
Appendix	6.2: Initial sample characteristics	292
Appendix	6.3: Items for inclusion in Stage 2 of the questionnaire development	293
Appendix	6.4: Second-stage questionnaire instrument: Shopping styles and cognitive processing.	295
Appendix	6.5: Summary results for Stage-two of the questionnaire development	300
Appendix	6.6: Hierarchical regressions for the consumer characteristics	303
Appendix	6.7: Questionnaire instrument for price-perceived-quality relationships	307
Appendix	7.1: Post-shopping survey instruments	308
Appendix	7.2: Illustrations of the layout of specials and produce at the survey location	324
Appendix	7.3: Hierarchical regressions: comparison of consumer characteristics between Chapter 7 and Chapter 6	326

Appendix 7.4:	Summary statistics for all fruits and vegetables	329
Appendix 7.5:	Summary cluster dendogram	331
Appendix 8.1	An encoding scheme for verbal reports of fruits and vegetables purchases	332
Appendix 8.2:	Disclosure And Informed Consent Form	352
Appendix 8.3:	Sample coding sheet for Judges	353

Figures

Figure 2.1:	A price-based model of value and willingness to buy.	2
Figure 3.1	Standardised price variance for selected fruits for the period Jan to Mar 1995 (variance against the mean = $(C = \sigma/\mu)*100$)	4
Figure 3.2	Actual price variance for selected fruits for the period Jan to Mar 1995.	4
Figure 3.3	Weekly price movements for selected fruits for the period Jan to Mar 1995 (Supermarket)	4
Figure 3.4	Weekly price movements for selected fruits for the period Jan to Mar 1995 (Independent).	4
Figure 3.5	Standardised price variance for selected vegetables for the period Jan to Mar 1995	4
Figure 3.6	Actual price variance for selected vegetables for the period Jan to Mar 1995	4
Figure 3.7	Weekly price movements for selected vegetables for the period Jan to Mar 1995 (Supermarket)	5
Figure 3.8	Weekly price movements for selected vegetables for the period Jan to Mar 1995 (Independent)	5
Figure 3.9	Weekly price movements for selected grocery items Jan to Mar 1995	5
Figure 3.10	Standardised price variance for selected grocery items Jan to Mar 1995	5
Figure 4.1	Strategies where there is a risk that the product is unacceptable	7
Figure 5.1	A model of the consumer decision process for choice in fruits and vegetables.	9
Figure 5.2	Research phases in the exploration of choice, and the role of price, in the purchase of fruits and vegetables	10
Figure 8.1	Sample elimination processes	21
Figure 8.2	Non-price choices: a focus on quality evaluation	21
Figure 8.3	Non-price choices: need for a product	21
Figure 8.4	Non-price choices: varietal and specific attribute preferences	22
Figure 8.5	Non-price choices: comparison across alternatives	22
Figure 8.6	Non-price choices: quality uncertainty	22
Figure 8.7	Non-price choices: favourites or treats	22

Figure 8.8	Response to an unfavourable price: quantity constrained or reduced	229
Figure 8.9	Response to an unfavourable price: alternative products or location	231
Figure 8.10	Response to an unfavourable price: price concerns overridden	233
Figure 8.11	Response to an unfavourable price: no purchase	233
Figure 8.12	Price-based choices: impulse purchases and price-only references	235
Figure 8.13	Price-based choices: quantity increased.	236
Figure 8.14	Price-based choices: price and quality evaluations and outcomes	237
Figure 8.15	Illustrations of product comparisons.	239
Figure 8.16	Risk and consumer behaviour	244
Figure 8.17a	Variety-seeking behaviour	245
Figure 8.17b	Variety-seeking behaviour	247
Figure 8.18	Illustrations of neutral price references	248

Tables

Table 3.1	Summary characteristics of selected fruits and vegetables
Table 3.2	Commonly Purchased Fruits and Vegetables
Table 3.3	Mean price per kilogram (*unit) for selected fruits - Jan to Mar 1995
Table 3.4	Mean price per kilogram (*unit) for selected Vegetables - Jan to Mar 1995
Table 4.1	Summary of working propositions
Table 6.1	Characteristic differences between High and Low NFCs
Table 6.2	Reliability results for four Factors of shopping attitude
Table 6.3	Summary characteristics of the external-student sample
Table 6.4	Reliability measures for the rational - experiential constructs
Table 6.5	Reliability results for four Factors of shopping attitudes.
Table 6.6	Mean scores and gender differences on factor measures
Table 6.7	Perceptions of the price-quality relationship for selected products
Table 6.8	Means for group price-quality perceptions
Table 7.1	Distribution of respondents according to weekday and time of day
Table 7.2	Summary statistics for the protocol sample*
Table 7.3	Reliability measures for the rational - experiential constructs: Comparison between the current and previous sample *
Table 7.4	Reliability results for four Factors of shopping attitudes: Comparison between the current and previous sample *
Table 7.5	A comparison of incidences of price and special recall against products' 'special status'.
Table 7.6	Reference price frequencies for Sample 1 respondents.
Table 7.7	Mean prices and Coefficients of variation for selected fruits at the Independent - Jan to Mar 1995 and May 1995
Table 7.8	Respondents' perceptions of varietal breadth and the options available for purchase
Table 7.9	Customer perceptions of the consistency in quality of selected fruits and vegetables
Table 7.10	Customer confidence in assessing the quality of selected fruits and vegetable
Table 7.11	Purchase frequencies and product usages for selected fruits and vegetables (percentages).

Table 7.12	Hierarchical regression of selected variables on Price recall (n=502)	186
Table 7.13	Classification for price-level and variance*	188
Table 7.14	Relative contribution of a reference to all references for an attribute - comparison across attributes	189
Table 7.15	Reference price by 'price/specials' recall and mean price recall	191
Table 8.1	Summary statistics for the protocol sample	202
Table 8.2	Summary frequencies and statistics of choice and other processes	204
Table 8.3	Summaries of subjects' shopping behaviour and personal characteristics	208
Table 8.4	Summary of processes across subject categories	211
Table 8.5	Summaries of elimination processes	212
Table 8.6	Summaries for non-price choice processes	216
Table 8.7 14-subject s	Non-price choices: number of accurate price recalls for the sample	224
Table 8.8	Summaries for price-featured choice processes	228
Table 8.9	Price-based choices: number of accurate price recalls for the 14-subject sample	250

'Yod has extensive cybernetic, mathematical and systems analysis programming, probability theory, up-to-date scientific knowledge of an encyclopedic width. He's also programmed with general history, forty languages, Torah, Talmud, halakic law...'

'Do you remember your equivalent of birth?'

'[The moment I came to consciousness] I was flooded with internal readouts, temperature. distances from me to other objects, chemical analyses, reports on the temperature of various parts of my skin and of the atmosphere... All facts seemed equal to me, any sensory readings as important as any other. That my left foot was seventeen point three centimetres from the lab table appeared as important as my ability to interface with bases at a speed and facility surpassing any human intelligence.'...

He turned and stared again at the moon. 'Now it's finally turning yellow. How often my stored information is partial. It says a banana is yellow when it is brown and black and yellow, and inside cream with brown flecks. It says the moon is yellow that rose from the bay red. The definitions of feelings I am programmed with are precise, orderly, but what I experience is sometimes sharper than I know how to endure'

('By the light of the unyellow moon', Body of Glass, M Piercy 1991)