The front of pack nutrition information panel: Using novel methods to explore consumer decision making at point of choice during routine supermarket shopping

Gill Cowburn

St Cross College

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Nuffield Department of Population Health

Medical Sciences Division

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Abstract

Encouraging people to make healthier food choices will make an important contribution to preventing non-communicable diseases. Most groceries purchased by UK households are from supermarkets, potentially making this an important setting where consumers might consider the nutritional quality of foods. While it is possible to purchase healthy food in supermarkets, the retail environment actively promotes the selection of less healthy items. Gaps remain in our understanding about which store based interventions - including providing on-pack nutrition information - can assist shoppers to make healthy food selections. Considerable evidence exists around consumer engagement with nutrition labelling, but there is a paucity of research conducted in real-life contexts. This thesis describes a qualitative study which explored factors which influence decision making at point-of-choice and sought to understand whether and how shoppers use the front of pack nutrition information panel during routine supermarket shopping. The study also investigated whether wearable cameras were useful research tools to understand how shoppers use the front of pack nutrition information panel, compared to a 'Think aloud' method. In this research, participants paid little attention to the front of pack nutrition information as they shopped. Food shopping was characterised as a complex, involved activity with priority given to a range of different issues over health and/or nutrition concerns. Although the front of pack nutrition information panel could offer support to shoppers, this study suggests that its presence is currently overwhelmed by commercially driven factors. Shoppers appear to need specific health or nutrition-related purchasing goals, be sufficiently informed and motivated to spend time attending to the front of pack nutrition information panel. Future interventions should raise awareness of the presence of nutrition information on pack and be clear about how this information can be used in different circumstances to guide consumers towards healthier choices. The study suggests that while data collected via 'Think aloud' or from viewing wearable camera images provides general information about food shopping decisions, eye-tracker technology can provide objective evidence of nutrition information use. Data capture was greatly strengthened by the use of a post-shop interview, where interviews generated specific and important contextual information relating to the use of the front of pack nutrition information panel.

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Dedication

This thesis is dedicated to:

Lara, for your determination, resilience and ability to delight and entertain

My parents, for strong foundations

My sister Jenny, for leading the way

Jess and Alice, with hope

Charlie and Forrest, for providing perspective

Charlie, for everything, always

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Declaration of Authorship

I declare that I have read and understood both the University's disciplinary regulations on plagiarism and the Education Committee's information and guidance on academic good practice and plagiarism. I declare that this thesis is entirely my own work except where otherwise indicated. I have clearly indicated the presence of all material I have quoted from other sources with appropriate references. I have acknowledged appropriately any assistance I have received in addition to that provided by my supervisors.

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Table of Contents

Abstract i
Dedication ii
Acknowledgements ii
Declaration of Authorship iii
Declaration of Funding iii
Table of Contents iv
List of Figures viii
List of Tables x
Glossary xi
List of Abbreviations xii
1. INTRODUCTION AND THE FOOD RETAIL ENVIRONMENT 1
1.1 Overview of the research 1
1.2 Structure of the thesis 2
1.3 Background 3
1.3.1 Healthy eating and the promotion of health and prevention of disease 3
1.3.2 Dietary recommendations 4
1.4 Food systems and the food environment 7
1.4.1 The community nutrition environment 8
1.4.2 The consumer nutrition environment 11
1.5 Supermarket based interventions to promote healthier choices 13
1.6 Point-of-choice interventions 15
2. NUTRITION LABELLING 18
2.1 Overview 18
2.2 Defining nutrition labelling 18
2.3 The historical and legal foundations of nutrition labelling 21
2.4 Previous nutrition labelling legislation 25
2.5 UK FOP labelling 25
2.6 The evidence base for nutrition labelling 28
2.6.1 Research on different approaches to displaying FOP nutrition information 29
2.6.2 Consumers' use of nutrition information 31
2.6.3 Impact on food purchases and dietary behaviour 35
2.7 Limitations of current evidence 36
3. METHODS 40

3.1 Introduction 40
3.2 The ‘Think aloud’ method 42
3.3 Wearable cameras 44
3.4 Ethics 46
3.5 Sampling 46
3.5.1 Study location 46
3.5.2 Recruitment 47
3.6 Data collection 54
3.6.1 Overview 54
3.6.2 Data collection quality assurance 59
3.7 Data analysis 59
3.8 Summary 63
4. PARTICIPANTS 64
4.1 Participant characteristics 64
4.2 Summary 72
5. FINDINGS: INFLUENCES ON PURCHASING DURING ROUTINE SUPERMARKET SHOPPING 73
5.1 Overview 73
5.2 Product-related themes 74
5.2.1 Price 74
5.2.2 Product type 78
5.2.3 Product presentation 79
5.2.4 Store choice and the store environment 82
5.3 Person-related themes 83
5.3.1 Shopping style 83
5.3.2 Preferences 85
5.3.3 Making healthy choices 89
5.4 Practicality-related themes 94
5.4.1 Meal planning 94
5.4.2 Other practicalities 96
5.5 Summary 96
6. FINDINGS: USING THE FRONT OF PACK NUTRITIONAL INFORMATION PANEL 98
6.1 Overview 98
6.2 Using the FOP nutrition information panel 98
6.2.1 Reasons for use and non-use 99
6.2.2 Impact on purchasing 104

6.2.3 A broader context for FOP nutrition information panel label use 104
6.2.4 Other issues which influence FOP nutrition information panel label use 108
6.3 Format of the FOP nutrition information panel and its different components 111
6.3.1 Format 111
6.3.2 Colour-coding 112
6.3.3 Grams 114
6.3.4 Text descriptors 114
6.3.5 Percentage Reference Intake figures 117
6.3.6 Specific nutrient and energy labelling 117
6.4 Confidence in using the FOP nutrition information panel 122
6.5 Impact of study participation 123
6.6 Summary 125
7. FINDINGS: COMPARING WEARABLE CAMERAS AND 'THINK ALOUD' METHODS – A QUALITATIVE ASSESSMENT OF DIFFERENT DATA CAPTURE METHODS 127
7.1 Overview 127
7.2 The acceptability of the different data collection methods 128
7.3 The nature of the data generated according to the different data capture methods used 130
7.3.1 Factors which influence purchasing decisions 131
7.3.2 Health, nutrition-related health and the FOP nutrition information panel 132
i) Health and nutrition-related health themes 132
ii) Nutrition labelling and the FOP nutrition information panel 132
7.4 The impact of the different prompts used by the researchers during the post-shop interview 140
7.4.1 Image data 141
i) Autographer image data 141
ii) Tobii image data 151
iii) Autographer vs Tobii image data 157
7.4.2 Assessing the post-shop interview prompts 160
7.5 Assessing the consistency of application of prompts by the researchers 162
7.6 Summary 166
8. DISCUSSION AND CONCLUSIONS 169
8.1 Overview 169
8.2 Study aims and main study findings 169
8.3 Discussion and implications 170
8.3.1 Making healthy choices in a supermarket environment 170

8.3.2 Using the FOP nutrition information panel 172
i) Attending to the label 172
ii) When is the label used and by whom? 174
iii) Label format 178
iv) Colour-coding 181
v) Specific nutrient labelling 182
vi) Portion size labelling 183
vii) Summary 183
8.3.3 Comparing the different data capture methods 186
i) The impact of the data capture method on recall of purchasing decisions 186
ii) Reactivity and the data capture methods 190
8.4 Strengths and limitations 191
8.4.1 Study strengths 191
8.4.2 Study limitations 193
8.5 Contribution to the evidence base 197
8.6 Recommendations 198
8.7 Conclusion 201
REFERENCES 203
APPENDICES 221

List of Figures

In the thesis, the numbering format for figures and tables is x.y where x= chapter number and y= number within chapter

Number	Title of Figure	Page
2.1	Examples of UK and USA BOP nutrition information panels	20
2.2	Examples of UK multiple traffic light and % Guideline daily Amount FOP nutrition information panels	20
2.3	Example of UK recommended format	21
2.4	Criteria requirements for additional forms of expression and presentation for nutrition information as declared by EU regulation n^{o} 1169/2011	24
2.5	Factors influencing nutrition label use	38
3.1	The Autographer and Tobii eye-tracking glasses (wearable camera devices)	44
3.2	Number of participants recruited via different recruitment methods	51
3.3	The number and purpose of store visits	53
3.4	Allocation of participant by shopping type and data collection method	55
3.5	Using Autographer and Tobii eye-tracking glasses in store	56
3.6	Data collection space, Store 1	59
4.1	Participants' recruitment into study stores	64
4.2	Age of participants	65
4.3	Highest educational achievement for participants	65
4.4	Employment status of participants at time of data collection	66
4.5	Self-reported health status at time of data collection	66
4.6	Household description	67
4.7	Type of special diet followed within household	67
4.8	Type of food outlet usually used by participants	68
4.9	Participants' attitude towards healthier eating	68
4.10	Participants' self-declared nutrition knowledge	69
4.11	Participants' nutrition knowledge scores	69
4.12	Participants' Healthy Eating Score reflecting their self-reported typical dietary pattern, as assessed by the Leeds SFFFQ	70

Number	Title of Figure	Page
4.13	Participants' declared frequency of use of FOP nutrition information panel	71
4.14	Participants' rating of the level of information provided on FOP nutrition information panel	71
4.15	Participants' rating of ease of understanding of FOP nutrition information panel	71
5.1	Influences on purchasing decisions during routine supermarket shopping: a summary of key themes	74
7.1	Key themes generated from 'Think aloud' shopping data	139
7.2	Key themes generated from 'Think aloud' post-shop interview data	139
7.3	Key themes generated from 'Image' post-shop interview data	140

List of Tables

Number	Title of Table	Page
1.1	Current UK population recommendations for adults aged 19+	5
2.1	Criteria for use of colour coding and descriptive text, per 100g of food	27
2.2	Reviews of nutrition labelling since 1991	32
3.1	Reasons given for non-participation in study	53
6.1	Reasons for use and non-use of the FOP nutrition information panel	100
6.2	Participants' interpretation of the meaning and action required with traffic light colours	116
7.1	Examples of data generated by the different data gathering methods	135
7.2	Browsing and choosing episodes captured by participants wearing the Autographer camera	146
7.3	Browsing/choosing episodes, as captured by the Tobii eye-tracking glasses	153
7.4	A detailed description of a specific browsing/choosing episode for each participant, Tobii eye-tracking glasses	154
7.5	Comparative data captured by the Autographer and Tobii eye-tracking glasses	157
7.6	Example of episodes illustrated by images taken with the Autographer and Tobii eye-tracking glasses	158
7.7	Prompts used in the Post-shop interview categorised according to data capture method	161
7.8	The types of prompts used by researchers across the three data capture methods	163
7.9	Summary of an analysis of the relative contribution of the different methods of data capture used in generating data themes	168

Glossary[1]

Energy – Energy is produced from the breakdown of fats, carbohydrates, protein and alcohol in the body. It is required to fuel all body systems. A kilocalorie (kcal) is a measurement of food energy but the internationally recognised measure is known as a kilojoule (kJ), where 4.2 kJ is equivalent to 1 kcal.

Fats – Animal and plant derived substances which provide a significant energy source for the body. Each gram of fat provides 37kJ or 9 kcal. Fats are formed by the combination of glycerol with triglycerides, with each triglyceride being composed of three fatty acids. Fatty acids exist in different forms - saturated fatty acids, mono-saturated and poly-unsaturated fatty acids have different chemical structures – and the combination of fatty acids defines the properties of the different types of fat. *Trans* fatty acids are produced by hydrogenation, a process which can take place during food processing.

Carbohydrates and Fibre – Plant derived compounds which are converted to energy in the body. Each gram of carbohydrate provides 16 kJ or 4 kcal. The simplest types of carbohydrate in the human diet are monosaccharides - glucose, fructose and galactose. Disaccharides – sucrose, lactose and maltose - are composed of two joined monosaccharides. Large numbers of monosaccharides joined together produce polysaccharides – starch. Non-starch polysaccharides (also known as dietary fibre), found in plane cell walls, cannot be digested by humans but are important in maintaining gut health and some forms of non-starch polysaccharides may have a role in lipid (fat) metabolism.

Total sugars – This refers to the total amount of sugar contained in a food product, including sugar which naturally occurs within the food and some of which may be present as free sugars

Free sugars – Sometimes called non-milk extrinsic sugars, these sugars are defined as any sugars added to food or drinks during the manufacturing process or which occur naturally in foods like honey, syrups or unsweetened fruit juices

Polyols – Also known as ‘sugar-replacers’, polyols are carbohydrates which contain less energy than sucrose, with a similar taste and texture. Examples include xylitol, sorbitol, mannitol and maltitol.

Protein – Animal and plant derived substances which are essential for growth and repair of body tissues. Protein can also be used as an energy source when each gram of protein provides 17 kJ or 4 kcal. Proteins are made up from different combinations of amino acids, some of which can be synthesised in the body but other amino acids – called essential amino acids – must be supplied from dietary sources.

Salt – a mineral which is required by the body, the term salt is sometimes used interchangeably with sodium. However sodium figures (given in grams) need to be multiplied by 2.5 to convert into the equivalent salt amount (in grams).

[1] National Health Service. "NHS Choices Live Well." Retrieved 07/12/16, from http://www.nhs.uk/livewell/Pages/Livewellhub.aspx.
Barker H (1996). Nutrition and Dietetics for Health Care. New York, Churchill Livingstone.

List of Abbreviations

FOP	Front of Pack
BOP	Back of Pack
% GDA	Percentage Guideline Daily Amount
% RI	Percentage Reference Intake
NCDs	Non-communicable diseases
WHO	World Health Organisation
DALYs	Disability-adjusted life years
NHS	National Health Service
SACN	Scientific Advisory Committee on Nutrition
BMI	Body Mass Index

1. INTRODUCTION AND THE FOOD RETAIL ENVIRONMENT

1.1 Overview of the research

Encouraging people to make healthier food choices will make an important contribution to preventing non-communicable diseases such as cardiovascular disease, diabetes and some cancers. Providing health information, such as front of pack (FOP) nutrition information, is considered to be a potentially useful way to help people choose healthier foods. Although an evidence base exists around consumer engagement with nutrition labelling, much remains to be understood, particularly in a real-life context. This thesis describes a study which uses qualitative research methods to explore how shoppers use the FOP nutrition information panel during routine supermarket shopping. The research aims to contribute to improving the impact of the FOP nutrition information panel as a means to support consumers in making healthier food choices in a food retail environment.

One of the difficulties in conducting real-life studies is the complexity of collecting data without impacting on 'usual' behaviour. This study used a novel data capture method (wearable cameras) to examine whether such methods might offer benefits to researchers compared with traditional data capture techniques in informing our understanding of the use of the FOP nutrition information panel by shoppers.

The thesis considers the following research questions:

1. What contextual factors influence decisions made at the point of choice during routine supermarket shopping?

2. In what ways do shoppers use the FOP nutrition information panel during their routine supermarket shopping?

3. What variations in patterns of use of the FOP nutrition information panel can be identified amongst shoppers doing their routine supermarket shop?

4. As a research tool, how useful are wearable cameras (a novel data collection method) in prompting and assisting participants to recall and articulate their use of the FOP nutrition information panel during routine supermarket shopping compared with a traditional 'Think aloud' data collection method?

1.2 Structure of the thesis

This chapter focuses on the background to the study. Firstly, I present the case for the role of healthy eating in the promotion of health and prevention of disease, summarise the key dietary recommendations for health, both globally and in the UK, and present information relating to the gap between dietary recommendations and current eating patterns in the UK adult population. I progress to consider briefly the food chain, characterise the nature of the food environment and the role of supermarkets. I then describe what is known about what helps people to make healthy dietary choices within this complex environment.

In Chapter 2, I move on to consider nutrition labelling, with a particular focus on the FOP nutrition information panel. Initially, I define nutrition labelling and provide a brief overview of the global, European and UK legislation which controls nutrition labelling. I then explore published literature around the development of different formats of nutrition labelling, and on consumer use and understanding of nutrition labelling, which updates the findings from the first systematic review in this area which I published (along with my colleague Lynn Stockley) in 2005 (Cowburn G and Stockley L 2005). Finally, I describe some of the limitations in the existing evidence base, which helped to inform the design and development of the study that I have undertaken.

Chapter 3 describes the rationale for the study, provides a detailed description of the methods chosen to address the thesis research questions and details the approaches

used for data collection and analyses. Chapter 4 presents information about recruitment and characterises aspects of the nature of participants who took part in the study. The next three chapters focus on presenting the findings of the study in relation to the research questions. The final chapter discusses the findings in the context of other research. I consider the contribution which this study makes to further our understanding of the use of nutrition labelling and reflect on the strengths and limitations of the study. Finally, based on the findings of this research, I offer specific recommendations for researchers, policy makers and retailers. These recommendations will contribute to the future development of the FOP nutrition information panel and increase its likely success as an intervention which is considered to be useful by consumers.

1.3 Background

1.3.1 Healthy eating and the promotion of health and prevention of disease

The prevention of non-communicable diseases (NCDs) like cardiovascular disease, diabetes and cancer present a major challenge for global public health. In 2013, six risk factors were identified as the most important contributors to the overall global burden of disease - *dietary risks, high systolic blood pressure, child and maternal malnutrition,* tobacco use, air pollution and *high body mass index* (GBD 2013 Risk factor Collaborators 2015). Four of the risk factor clusters (shown in italics above) involve a significant dietary component, with a combination of fourteen specific dietary components accounting for nearly one tenth of global disability-adjusted life years (DALYs) - a measure of number of years lost due to ill-health, disability or early death (GBD 2013 Risk factor Collaborators 2015). The most important dietary factors which contribute to this overall diet burden are low levels of consumption of fruit, vegetables, wholegrains and nuts/seeds and high levels of sodium consumption, although dietary patterns (and so individually important dietary components) differ considerably between countries. In addition, high body mass index (BMI) accounted for 4·4 million deaths and 134·0 million DALYs in 2013 (GBD 2013 Risk

factor Collaborators 2015). Within the UK, modelled estimates have suggested that a reduction of around 33,000 deaths per year from coronary heart disease, stroke and cancer could result from the population achieving dietary targets for fruit and vegetables, dietary fibre, saturated fat and salt (Scarborough P, Nnoaham K et al. 2010). Estimates have also suggested that poor diets (and overweight and obesity) confer a significant economic burden on the National Health Service (NHS), with diet-related ill health estimated to have cost the NHS in the UK £5.8 billion in 2006-07 (Scarborough P, Bhatnagar P et al. 2011).

1.3.2 Dietary recommendations

In 2004, the World Health Organisation (WHO) adopted its Global Strategy on Diet, Physical Activity and Health after recognising the links between unhealthy diets (and physical inactivity) and the increased risk of NCDs. This strategy called for the creation and adoption of mechanisms for risk factor reduction, including the development of national dietary guidelines, along with raising awareness of the value of preventive interventions (World Health Organisation 2004). The Strategy's dietary recommendations to promote healthier eating patterns are shown below. They recommend that populations and individuals should:

- achieve energy balance and a healthy weight
- limit energy intake from total fats and shift fat consumption away from saturated fats to unsaturated fats and towards the elimination of *trans* fatty acids
- increase consumption of fruits and vegetables, and legumes, whole grains and nuts
- limit the intake of free sugars
- limit salt (sodium) consumption from all sources and ensure that salt is iodized

(World Health Organisation 2004)

Despite consumer perceptions about the ever changing nature of dietary advice (Nestle M 2015), dietary recommendations to promote health and prevent disease have been broadly consistent for more than three decades (National Advisory Committee on Nutrition Education 1983, World Health Organization 2003, World Health Organisation 2004, American Institute for Cancer Research and World Cancer Research Fund 2007). Public Health England recently summarised the UK Government's dietary recommendations for the population, based on assessments of the evidence base by the Scientific Advisory Committee on Nutrition (SACN), shown in Table 1.1 (Public Health England 2016).

Table 1.1: Current UK population dietary recommendations for adults aged 19+

Energy (kcal/day)*	2000kcal/day for females; 2500kcal/day for males
Protein (g/day)	45-46.5g/day for females (increased requirement for older females – aged 65+); 55.5-53.3g/day for males (decreased requirement for older males – aged 65+)
Fat (g/day)*	Less than 78g/day for females; less than 97g/day for males No more than 35% total food energy
Saturated fat*	24g/day for females; 31g/day for males No more than 11% total food energy
Polyunsaturated fat*	14g/day for females; 18g/day for males No more than 6.5% total food energy
Monounsaturated fat*	29g/day for females; 36g/day for males No more than 13% total food energy
Carbohydrate (g/day)*	At least 276g/day for females; 333g/day for males At least 50% total food energy
Free sugars*	27g/day for females; 33g/day for males No more than 5% total food energy
Salt (g/day)	Less than 6g/day for females and males
Dietary fibre (g/day)	30g/day

Key: *decreasing requirement for both older females and older males – aged 65+

Significant progress is still required if the population is to achieve the UK Government's dietary recommendations. National Nutrition and Diet survey figures suggest that:

- only 27% of UK adults aged 19-64 and 35% of older adults achieve the recommended consumption of five or more portions of fruit and vegetables per day
- oily fish consumption is below recommended levels of at least one portion per week
- red and processed meat consumption is above recommended levels for men
- non-milk extrinsic sugar consumption (from sugar, preserves, confectionery, soft-drinks and fruit juice, cakes and biscuits and alcoholic beverages) is higher than recommended levels in all adults except older women
- saturated fat consumption is higher than recommended levels for all adults
- dietary fibre consumption for adults is below recommended levels

(Public Health England and the Food Standards Agency 2016)

Townsend *et al* (2015) report that 24% of women and 26% of men in the UK are classified as obese (BMI > 30kg/m^2) (Townsend N, Bhatnagar P et al. 2015). Trends in obesity are influenced by deprivation, at least in UK women, with those women categorised as living in the 'most deprived' areas have obesity levels of 33% (Public Health England 2014). Trends in other aspects of diet-related behaviour are also influenced by income level. Only 19% of men and 23% of women with the lowest income achieved the five-a-day target for fruit and vegetables compared to 30% of men and 35% of women on the highest income (Department for Environment Food and Rural Affairs 2014). Family Food survey data suggest that lower income households also spent proportionally more of their household spend on food compared to those with a higher income (15% vs 11%, respectively, in 2014) (Department for Environment Food and Rural Affairs 2014).

1.4 Food systems and the food environment

The Food and Agriculture Organisation of the United Nations define a food system as *"the way we produce, collect, transform and distribute foods"* (Food and Agriculture Organisation of the United Nations 2016). This system involves a complex series - or chain - of interconnected actions which move food commodities from initial production through to consumption. At the end of the 'chain' the consumer has a role in deciding what food products to purchase and consume for themselves and others. Social ecological models suggest that those decisions are influenced by a combination of factors which act at an individual, social and cultural, community and policy level (Sallis JF and Glanz K 2009). At its broadest, consumer decision making takes place in the context of a global food system predominantly influenced by multi-national corporations which produce and promote refined, non-seasonal, industrially processed food (Lang T 1999). This has created a food environment increasingly dominated by relatively inexpensive, heavily marketed food products which are energy-dense, high in saturated fats, salt and added sugar (Vandevijvere S and Swinburn B for the International Network for Food Obesity/Non-Communicable Diseases Research Monitoring Action Support 2014). Changing this 'hostile' food environment to make it feasible to make healthier choices is seen as a central element within effective interventions to promote healthier eating (Swinburn B, Egger G et al. 1999, Butland B, Jebb S et al. 2007, Sallis JF and Glanz K 2009).

The food environment has been divided by Glanz *et al* (2005) into four distinct aspects – the community nutrition environment, the organisational nutrition environment, the consumer nutrition environment and the information environment (Glanz K, Sallis JF et al. 2005), which are described in more detail below. Each of these environments has been postulated to be both the cause of, and the solution to, unhealthy food consumption (Story M, Kaphingst KM et al. 2008, Bowen DJ, Barrington WE et al. 2015). But understanding the complexity within each environment, the probable interaction between the

environments, and how these relationships affect dietary behaviour is likely to require the development of more robust measures than have been available to date (McKinnon RA, Reedy J et al. 2009, Kelly B, Flood VM et al. 2011, Caspi CE, Sorensen G et al. 2012, Black C, Moon G et al. 2014).

The *community nutrition environment* describes the character and distribution of food stores, restaurants or other food outlets which are available to the general population. Food outlets in workplaces, educational institutions and health care facilities, most commonly available to specific population groups, or home provision is characterised as the *organisational food environment*. The environment consumers are exposed to once they enter a food store or an organisational setting is described as the *consumer nutrition environment*, with the *information environment* relating to media and advertising (Glanz K, Sallis JF et al. 2005). Here, I focus on characterising the community nutrition environment and the consumer nutrition environment, as these are most relevant to the context of this thesis, while recognising the important influence of the organisational and information environments on the dietary choice of individuals and populations.

1.4.1 The community nutrition environment

The distribution of food outlets within the community nutrition environment has been linked to dietary health outcomes (Caspi CE, Sorensen G et al. 2012, Thompson C, Cummins S et al. 2013, Black C, Moon G et al. 2014) and the over-representation of access to fast-food outlets and convenience store in areas where poorer and/or minority populations reside linked to environmental injustice (Hilmers A, Hilmers DC et al. 2012). Studies have used a range of methods to characterise geographical access to different types of food stores (such as supermarkets, smaller convenience food stores, fast food outlets and other food outlets). Typically these include measures of proximity and/or density, assessed via Geographic Information Systems, or use store audit measures to

assess the availability of defined food categories (such as fruit and vegetables) within and between defined areas (Caspi CE, Sorensen G et al. 2012).

Wrigley *et al* (2003) describe an uncontrolled before and after study which found a modest impact on fruit and vegetable consumption, particularly for those with the poorest intake, amongst consumers who switched to using a new retail facility in a deprived urban area of England, suggesting that improved fruit and vegetable provision within an area might influence dietary intake (Wrigley N, Warm D et al. 2003). However, this impact was not observed in another quasi-experimental UK based study (Cummins S, Petticrew M et al. 2005) and Cummins and Macintyre (2006) suggested that while supporting evidence exists to link low-income and minority neighbourhoods with poor access to food stores in the USA, there was limited evidence for these links in other countries (Cummins S and Macintyre S 2006). A systematic review by Beaulac *et al* (2009) confirmed the existence of 'food deserts', areas with poor access to healthy and affordable food in the United States where differences were related to income and ethnicity. However, they also reported only weak evidence for the presence of food deserts in other high-income nations (Beaulac J, Kristjansson E et al. 2009).

A study examining availability and affordability of a selected range of healthy food items across food stores in Scotland also found no evidence of urban 'food deserts', although the authors point out that the presence of food stores in an area does not imply that stores are equally accessible to all consumers (Dawson J, Marshall D et al. 2007). This study found that access to a range of healthy food was influenced by the size of stores in an area rather than whether the area was considered to be deprived or more affluent. Large or medium sized stores were more likely to stock the indicator 'healthy' items used in the study than small stores, except in more remote rural areas when small stores stocked a wider range of the selected healthy items. Affordability also appeared to be related to store type with small stores providing indicator 'healthy' items at a higher average price than larger stores. The authors concluded that the nature of retail provision

in an area may be more important than deprivation in influencing the availability of healthy food items and suggested that a key lever for the promotion of healthier eating lies within in-store policies on availability and pricing of healthy foods (Dawson J, Marshall D et al. 2007).

Gustafson (2012) reported that proximity to food stores may not necessarily be related to diet or weight outcomes (Gustafson A, Hankins S et al. 2012). A natural experiment assessing the impact on diet following the introduction of a supermarket into a food desert in one US neighbourhood found some improvements in overall diet quality but improvements were not linked to use of the new supermarket, suggesting that the mechanisms behind these changes may not be simplistic (Dubowitz T, Ghosh-Dastidar M et al. 2015).

The self-service supermarket has had a profound influence on the food purchasing and consumption patterns of the UK population since their expansion in the grocery sector from the 1950's (Hamlett J, Alexander A et al. 2008, Institute of Grocery Distribution 2010). Five main supermarket chains in the UK (Tesco, Sainsbury's, Asda, Morrisons and the Co-operative) dominate the grocery sector, and along with other supermarkets, effectively control food distribution within the food chain and reduce competition from smaller, independent retailers (Friends of the Earth 2005, Steedman P and Falk T 2009, Kantar World Panel 2016). The vast majority of all groceries purchased by households are sourced from supermarkets (Competition Commission 2000, Food Standards Agency 2007) and the grocery market's share accounts for 50.2p in every £1 of UK retail spending (Institute of Grocery Distribution 2016). Shopping trends show that food tends to be purchased at one 'main' shop per week supplemented by smaller supplementary shopping trips, one to three times per week, for items which have run out or been forgotten (Food Standards Agency 2007, Steedman P and Falk T 2009). A report by the Future Foundation in 2007 found that the average distance to the nearest supermarket for people in regions of England and Central Scotland was less than 2 miles, although the

average number of miles travelled to the supermarket people identified as their 'main' shop was nearly 4 miles, suggesting that proximity to a supermarket may not be the only driver for its use (Future Foundation 2007). A Neilsen survey found that product range and availability and good value for money ranked alongside convenient location when shoppers chose which retailer to use (Neilsen 2016).

Food purchased from supermarkets, measured using both till receipts and electronic sales data, is related to dietary intake, particularly of fat and energy (Ransley J, Donnelly JK et al. 2001, Eyles H, Jiang Y et al. 2010). Encouraging and enabling consumers to make healthier purchases during their supermarket visits is likely to have a positive effect on dietary quality.

1.4.2 The consumer nutrition environment

Once inside their selected supermarket, the shopper is faced with upwards of 30,000 food products from which to select (Spector D 2015, J Sainsbury plc 2016). The in-store environment is created by the supermarkets to offer choice to shoppers. But there is considerable debate about whether this choice is driven solely by consumer demand. Manufacturers and retailers also need to increase sales and market share in a highly competitive commercial sector. In their review of food marketing, Chandon and Wansink (2012) suggest that the task of food marketers is to 'profitably offer' to consumers what they want, which the authors argue is '*tasty, inexpensive, varied, convenient and healthy foods – roughly in that order of benefit importance'* (Chandon P and Wansink B 2012).

The 'marketing mix' of the 4 P's – *p*roduct, *p*rice, *p*romotion and *p*lace – are still common merchandising techniques used within supermarkets, although additional sub-categories have been added over time (van Waterschoot W and van den Bulte C 1992). With these marketing tools, food retailers (and to a lesser extent food manufacturers') control the layout of stores, which food products will be made available, where these products will be

displayed within the store and how they will be promoted (Matamalas RL and Ramos MS 2009, Lubin G 2011). It has been argued that these choices have a considerable impact on the store environment by favouring products from large scale manufacturers, reducing competition from smaller food producers and potentially reducing consumer access to a wider range of healthier products (Rivlin G 2016). Others go further to propose that *'food marketing has made us fat…most likely through increased access to continuously cheaper, bigger and tastier calorie-dense food'* (Chandon P and Wansink B 2012). Consumer organisations have also voiced concern about a range of commonly used pricing strategies which it is argued confuse shoppers and impact on their ability to make fair price comparisons between food products (Which 2015).

Food purchasing decisions in supermarkets have been found to be influenced by factors affected by the marketing 'mix'. These include packaging, promotion, taste, usual purchasing behaviour, pricing (NiMhurchu C, Blakely T et al. 2009) and shelf space (Curhan R 1974). Glanz *et al* (2012) report that end-of-aisle displays, merchandising displays, signage and shelf labels influence purchasing decisions (Glanz K, Bader MD et al. 2012). While it is possible to source and purchase healthy food from supermarkets, the retail environment within stores actively promotes and encourages the selection of less healthy items (Economic and Social Research Council 2014). However, little yet seems clear about the links between the in-store environment and the dietary intake of consumers. In their review of reviews, Black *et al* (2014) assessed studies which examined the associations between diet quality and in-store pricing and also availability, variety and quality of healthier foods. They found that there was mixed evidence of a link between in-store healthy product availability and healthier dietary intakes in studies from the US and less robust evidence around the impact of price. They also reported inconsistent, and thus inconclusive, findings from the limited number of studies conducted outside the USA and suggest that little is yet known conclusively about other aspects of

the consumer nutrition environment, namely '*variety, quality, placement and promotions'* (Black C, Moon G et al. 2014).

In part, this may be due to a paucity of comprehensive measures of the consumer nutrition environment. Commonly, measures have used checklists or composite scores to assess the nature of the in-store offering (Kelly B, Flood VM et al. 2011). Such measures have been criticised because in-store audit tools have tended to include a wide, but differing, range of food products, making comparison between studies difficult and may not yet be sophisticated enough to understand the complexity across store types and in diverse settings (Gustafson A, Hankins S et al. 2012). Thompson *et al* (2013) found that the residents in their study in a deprived area of the UK differed in the ways they interacted with the in-store supermarket environment, and they suggest – along with others - that more needs to be known about the shopping habits of consumers in order to help plan interventions to support healthier food choices within stores (Gustafson A, Hankins S et al. 2012, Thompson C, Cummins S et al. 2013, Pechey R and Monsivais P 2015).

1.5 Supermarket based interventions to promote healthier choices

A range of in-store interventions have been adopted to encourage shoppers to make healthier food selections. In their review of health promotion interventions to promote healthy eating, Roe *et al* (1997) identified eight studies which were based in a supermarket setting, all from the USA. These used a range of intervention approaches including point-of-choice programmes (based on shelf signs, supported by promotional material, recipe cards, taste testing and advertising in-store), a national advertising campaign, the use of educational videos and guided supermarket tours (Roe L, Hunt P et al. 1997). From this limited body of evidence it was suggested that interventions might have a small positive impact on food purchases as long as the intervention was in place (Roe L, Hunt P et al. 1997).

In 2014, Liberato *et al* published a systematic review of interventions to encourage healthier food purchasing and identified twenty seven studies undertaken in a food store or supermarket setting (Liberato SC, Bailie R et al. 2014). The majority of studies had taken place in the USA, with a few studies based in New Zealand, Canada, South Africa and the Netherlands. The authors identified similar intervention approaches to those identified by Roe *et al* (1997), and also noted the testing of two additional types of intervention approach - enhancing availability of healthy food and monetary incentives to customers and/or to store-owners. They identified significant heterogeneity in interventions - in terms of the intervention type, duration, intensity and outcomes - and found that because of this heterogeneity, and the limited number of studies which had been undertaken, the most promising approach to encouraging change was offered by providing monetary incentives to customers (Liberato SC, Bailie R et al. 2014). Escaron *et al* (2013) suggest that combining 'demand-side' interventions (like point-of-choice schemes, advertising and promotions) with 'supply-side' interventions like changes in pricing and availability of food products could influence customers towards healthier purchases (Escaron AL, Meinen AM et al. 2013).

In 2004, the Scottish Grocers Federation Healthyliving Programme was established to improve the provision of fresh produce and healthier food choices via local convenience stores, particularly those situated in low income areas. Evaluation suggested that pilot (and subsequent roll out) of the programme had a positive impact on attitudes and purchasing of targeted produce, with successful activities including improving in-store facilities, increasing the space and prominence of displays of fruit and vegetables and provision of an in-store 'champion' (Scottish Government 2009). Based on this successful work, Adams *et al* (2012) report on a process evaluation of a UK convenience-store based intervention, which aimed to promote access to fresh fruit and vegetables in deprived, urban areas of England (Adams J, Halligan J et al. 2012). The intervention was designed to offer branded point-of-sale materials for all stores, chill-cabinet provision for

some stores and access to training, support and local links with public health professionals in order to increase the range and availability of fresh fruit and vegetables and to increase the prominence with which fruit and vegetables were displayed within stores. The authors hint at practical difficulties in maintaining the fidelity of the intervention and reported that lack of availability of replacement point-of-sale materials, no financial support around wastage, poor communication and limited engagement with local health workers were likely to have contributed to the limited potential impact of the intervention (Adams J, Halligan J et al. 2012).

Significant gaps still remain in our understanding of how to help consumers make healthier choices during their food shopping – for example, little is known about whether different approaches are required to encourage uptake of healthier food categories like fruit and vegetables compared with the need to reduce other components such as dietary fat; or about the effect of 'cross-promotion' where healthier food products are positioned together (Glanz K and Yaroch AL 2004). Most authors have also called for more rigorous testing of interventions to strengthen the evidence base (Glanz K and Yaroch AL 2004, Seymour JD, Lazarus Yaroch A et al. 2004, Escaron AL, Meinen AM et al. 2013, Liberato SC, Bailie R et al. 2014).

1.6 Point-of-choice interventions

A point-of-choice intervention has been defined as *'a tool or intervention designed to interrupt and influence habitual behaviour at a time of decision making'* (Lewis AL 2011). As highlighted previously, point-of-choice interventions to promote healthier food choices can include a range of different elements, including attaching information to shelves, posters next to or on the product rack, recipe cards, taste testing, promotions in-store and on-pack signage. This definition includes the FOP nutrition information panel, which is the focus of this thesis. The WHO classified fiscal policies and point-of-purchase interventions in food stores (and a range of other food outlets) as moderately effective in supporting

healthier food choice decisions in their systematic review of diet and physical activity interventions (World Health Organisation 2009).

Sutherland *et al* (2010) reported on the introduction of their nutritional navigation system into a chain of US supermarkets. The Guiding Stars intervention used a three tiered star icon on shelf labels to encourage a shift in purchasing to healthier choices across a range of food product categories. They suggest that the shelf labels (augmented by educational material and signage in store) which provided *'simplified at-a-glance nutrition information'* were successful in impacting on food purchases immediately and in the longer term, although the authors acknowledge that secular trends may have influenced their findings (Sutherland LA, Kaley LA et al. 2010). In a systematic review of seventeen studies, in urban North America, providing health information at point-of-choice, van 't Riet (2012) found mixed evidence of effectiveness on purchase behaviour. Although the overall impact of the interventions was inconclusive, he reported that there were some indications that interventions were more likely to be effective when they were in place for more than twelve months, included additional elements (like advertising, in-store taste testing and cooking demonstrations) and targeted both healthy and unhealthy nutrients (van t Riek J 2012).

As a point-of-choice intervention, the purpose of the FOP nutrition information panel is to inform and/or remind consumers about the healthiness of a product, to promote healthier food choices within the store (van t Riek J 2012) and to encourage shoppers to consider and make a healthier food selection. The underlying premise of the intervention is that provision of nutrition information will engage and motivate shoppers to use the information provided to help them to select healthier food options as they shop. As such, it represents an individualised 'health education' approach which has been suggested as a weak mechanism to engender change compared to population-based measures which, for example, target the food marketing environment or address the taxation and/or subsidy of food categories (Naidoo J and Wills J 2000, Brambila-Macias J, Traill WB et al. 2011). As

I have previously noted, the provision of nutrition information on pack is also an important strand of consumer protection – with shoppers having the right to be informed of the nutritional content of foods they are considering for purchase (Cowburn G and Stockley L 2005). If nutrition information is to be provided it should be available, accessible and usable by all shoppers in order to play its role in supporting healthier food choice.

In the following chapter, I move on to consider nutrition labelling and the FOP nutrition information panel in more detail with the intention of describing what is currently known about how consumers engage with and use this type of point-of-choice intervention.

2. NUTRITION LABELLING

2.1 Overview

In this chapter, I define nutrition labelling and its purpose. I provide a brief overview of the global, European and UK legislation which controls nutrition labelling and describe the FOP nutrition information panels UK shoppers are most likely to encounter in store. I examine what is known about the different ways to display nutrition information on pack, consumers' use of this information and its impact on purchasing and dietary behaviour. I also consider a key limitation in the existing evidence base, which helped to inform the design and development of the study that I have undertaken.

2.2 Defining nutrition labelling

Nutrition labelling is a general term used to describe a range of nutrition information provided on pre-packed food items. Specific definitions vary by legislative jurisdiction but nutrition labelling can be separated into four broad categories, as described below:

- Back-of-pack (BOP) nutrition information panel - provides information on the nutritional content of a food. This may include macro- and/or micro-nutrients with quantities usually specified according to 100g of the product and per typical serving size, although the actual format and content of the label is determined by legislation.
- Front-of-pack (FOP) nutrition information panel - shows a simplified version of the nutrition information found on the back-of-pack. The front-of-pack nutrition panel is provided voluntarily so there is no standard design for format or content.
- Summary nutrition/health logos - sometimes named 'signposting' schemes, nutrition and/or health logos are provided on foods which meet pre-defined

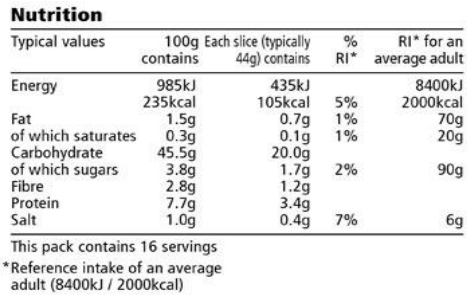
nutrient levels and give integrated information about the range of nutrients in a food.

- Nutrition/health claims - In Europe, these claims must comply with European Regulation (EC) No 1924/2006 on nutrition and health claims made on food. Government guidance (Department of Health 2011) suggests that the following definitions apply: *A nutrition claim is defined as any claim which states, suggests or implies that a food has particular beneficial nutritional properties due to the presence, absence, increased or reduced levels of energy or of a particular nutrient or other substance, and includes claims such as 'source of calcium', 'low fat', 'high fibre' and 'reduced salt'.* A health claim is defined as any claim that states, suggests or implies that a relationship exists between a food category, a food or one of its constituents and health. This would include claims such as 'calcium helps maintain normal bones'. More general claims such as 'good for you' may also be health claims.

The primary focus of this thesis is the FOP nutrition information panel but I also refer to the BOP nutrition information panel because the evidence base frequently relates to both of these types of nutrition labelling.

The purpose of nutrition labelling is to provide consumers with information about the nutritional content of a food product. Both BOP and FOP nutrition information panels provide this as a 'neutral' nutrient declaration but the two categories of nutrition label differ in the level of interpretive 'supplementary nutrition information' which they also provide (Rayner M, Wood A et al. 2013). On a typical BOP nutrition information panel (shown in Figure 2.1) additional information in the form of Guideline Daily Amounts (% GDA's) - now referred to in UK labelling as Percentage Reference Intake (% RI) and referred to as the Percentage Daily Value in the USA - is provided which aims to help consumers consider the nutritional content of a specific food product in the context of their daily nutrient intake.

Figure 2.1: Examples of UK and USA BOP nutrition information panels*



Nutrition

Typical values	100g contains	Each slice (typically 44g) contains	% RI*	RI* for an average adult
Energy	985kJ 235kcal	435kJ 105kcal	5%	8400kJ 2000kcal
Fat	1.5g	0.7g	1%	70g
of which saturates	0.3g	0.1g	1%	20g
Carbohydrate	45.5g	20.0g		
of which sugars	3.8g	1.7g	2%	90g
Fibre	2.8g	1.2g		
Protein	7.7g	3.4g		
Salt	1.0g	0.4g	7%	6g

This pack contains 16 servings

*Reference intake of an average adult (8400kJ / 2000kcal)

Example of a UK Label

Nutrition Facts

Serving Size 1 cup (228g)
Servings Per Container 2

Amount Per Serving

Calories 260 — Calories from Fat 120

	% Daily Value*
Total Fat 13g	**20%**
Saturated Fat 5g	**25%**
Trans Fat 2g	
Cholesterol 30mg	**10%**
Sodium 660mg	**28%**
Total Carbohydrate 31g	**10%**
Dietary Fiber 0g	**0%**
Sugars 5g	
Protein 5g	

Vitamin A 4% • Vitamin C 2%
Calcium 15% • Iron 4%

* Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs:

	Calories:	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400mg	2,400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

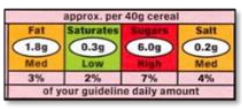
Calories per gram:
Fat 9 • Carbohydrate 4 • Protein 4

Example of a USA Label

Additional elements in the FOP panel (like colour-coding and text descriptors – High, Medium and Low) are provided alongside % RI figures and are intended to simplify interpretation and to point consumers towards healthier choices (Hawkes C 2008, Magnusson RS 2010). Examples of UK multiple traffic light and % GDA formats are shown in Figure 2.2.

Figure 2.2: Examples of UK multiple traffic light and % Guideline Daily Amount FOP nutrition information panels*

PER PACK		GDA
calories	382	19%
sugars	3.6g	4%
fat	13.9g	20%
saturates	1.9g	9%
salt	2.96g	49%



approx. per 40g cereal			
Fat	Saturates	Sugars	Salt
1.8g	0.3g	6.0g	0.2g
Med	Low	High	Med
3%	2%	7%	4%

of your guideline daily amount

Each serving contains:

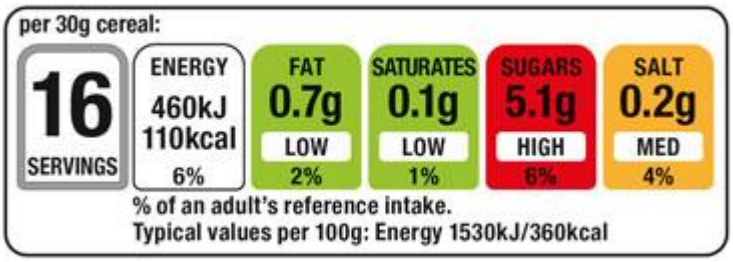
Calories	Sugars	Fat	Saturates	Salt
218	6.3g	3.2g	1.4g	0.2g
11%	7%	5%	7%	3%

of an adult's guideline daily amount

* Example images sourced from www.nhs.uk/Livewell/Goodfood/Pages/food-labelling.aspx, www.google.co.uk/search?q=nutrition+labels (accessed 19/10/16)

Although UK shoppers may see a variety of different FOP nutrition information panel formats, most retailers (and some manufacturers) are changing their packaging to the recommended format for use in the UK, shown in Figure 2.3 (Department of Health, Food Standards Agency et al. 2013).

Figure 2.3: Example of UK recommended format*



Interpretive labelling has also been heralded as an important factor in encouraging reformulation - improvements made in the nutritional profile of food products by manufacturers so that packaging can display a 'healthier' FOP nutrition information panel - although stronger evidence of the impact on labelling on reformulation is needed (Hawkes C 2008, Lobstein T and Davies S 2009, Vyth EL, Steenhuis IH et al. 2010, Galizzi MM 2012, Van Camp D, de Souza Monteiro DM et al. 2012).

2.3 The historical and legal foundations of nutrition labelling

The origins of mechanisms to protect consumers from the fraudulent provision of food can be located in ancient Egyptian, Indian, Chinese, Greek and Roman times (Food and Agricultural Organisation 1999, Lasztity R, Petro-Turza M et al. 2009). Early English legislation to control price, weight and quality of food and drink can be traced to the 13th Century, with the Assize of Bread and Ale in 1266-7 (Ross ASC 1956, Bennett JM 1996). Later legislation had its roots in preventing the common practice of food and drink

* Example image sourced http://www.nhs.uk/news/2013/06June/Pages/universal-colour-coded-food-nutrition-labels.aspx (accessed 26/10/16)

adulteration in Victorian London, initially with the Food Adulteration Act in 1860. This was followed by more effective and enforceable law with the passing of the Sale of Food and Drugs Act of 1875 which prohibited the sale of foodstuffs *'injurious to health'*. It gave protection to those food sellers who provided an accurate label for their products and offered the possibility of prosecution for *'every person who shall wilfully give a label with any article sold by him which shall falsely describe the article sold'* (Parliament HM 1875).

Modern UK food law continues to protect consumers from being misled during food purchasing via a complex range of legislation. The Food Safety Act 1990 makes it an offence to sell food for human consumption which *'is injurious to health, fails to comply with food safety standards or is falsely described, labelled or advertised for sale'* (Parliament HM 1990).

Internationally, codes of practice around food law are provided by Codex Alimentarius. According to the Food and Agricultural Organisation (1999), '*The 'Codex Alimentarius General Standard for the Labelling of Prepackaged Foods and the Guidelines on Nutrition Labelling, are aimed at ensuring honest practices in the sale of food while also providing guidance to consumers in their choice of products'* with the purpose *'to ensure that nutrition labelling is effective "in providing the consumer with information about a food that a wise choice can be made…"*' (Food and Agricultural Organisation 1999). This guidance originally stipulated voluntary nutrition labelling, except in the presence of a claim. The guidance was amended in 2012 to recommend mandatory nutrition labelling, which has been adopted in more than 50 countries, including United States, Canada, Mexico, Argentina, Brazil, Chile, Colombia, Ecuador, Paraguay, Uruguay, European Union countries, Russia, Israel, India, Hong Kong, China, Japan, South Korea, Malaysia, Taiwan, Thailand, Philippines, Indonesia, Australia and New Zealand (European Food Information Council 2015, Food and Agricultural Organisation 2016). Codex is now considering the development of a global standard for FOP interpretive nutrition labelling (Food and Agricultural Organisation 2016).

Legislation relating to food and nutrition labelling for European Union countries falls within the responsibility of the European Parliament and the Council of the European Union, with implementation and enforcement responsibilities assigned to national governments. The impact of the UK's referendum vote to leave the EU on food laws is currently unknown but early indications suggest that existing regulations will pass into UK law, at least on a temporary basis (Watts J 2016).

EU law on the provision of food information to consumers [EU Regulation n^{o}1169/2011] came into force in December 2011 and was applied from December 2014 (European Commission 2011). The requirement to provide nutrition labelling information, as part of this legislation, applied from December 2016. The new law made significant changes to previous food and nutrition labelling regulations and combined existing directives into a single piece of legislation. A transitional period has allowed food and nutrition labels to be modified voluntarily to meet the requirements of the new law in advance of its enforcement.

The primary rationale for the legislation around food labelling is to inform and protect consumers and to prevent the use of information that would either mislead the purchaser or suggest that specific foods could act as medicine. This means that standardised information about the name of the food; the list of ingredients; information on allergens; the quantity of certain ingredients or categories of ingredients; the net quantity of the food; the date of minimum durability or 'use by' date; special storage and preparation conditions; name or business name of the food business operator and the country of origin must be provided on the food label (European Commission 2011).

A major change from previous legislation is the requirement for mandatory provision of nutrition information on packaging. Information must be provided for energy/kcal/kJ, fat/g, saturates/g, carbohydrate/g, sugars/g, protein/g and salt/g. Information about monounsaturated fat, polyunsaturated fat, polyols, starch, fibre and defined vitamins and

minerals present in significant amounts may be provided voluntarily. In addition, repetition of information on energy, fat, saturates, sugars and salt in the *'principle field of vision'* is allowed, thus enabling the voluntary provision of FOP nutrition information. The mandatory nutrition declaration should refer to 100g/100ml amounts and, if appropriate, additional portion based declarations are allowed. Rules around the placement and presentation of nutrition information are prescribed, although additional forms of expression and presentation are allowed providing these meet a range of requirements, as shown in Figure 2.4. This enables the use of graphical symbols in addition to words and numbers. The regulations allow Member states to recommend the use of one or more additional forms of expression or presentation of the nutrition declaration within their country (European Commission 2011).

Figure 2.4: Criteria requirements for additional forms of expression and presentation for nutrition information as declared by EU Regulation n^{o}1169/2011

Additional forms of expression and presentation must:

- Be based on sound and scientifically valid consumer research and not mislead the consumer
- Be developed as the result of consultation with a wide range of stakeholder groups
- Aim to facilitate consumer understanding of the contribution or importance of the food to the energy and nutrient content of a diet
- Be supported by scientifically valid evidence of understanding of such forms of expression or presentation by the average consumer
- In the case of other forms of expression, be based either on described harmonised reference intakes, or in their absence, on generally accepted scientific advice on intakes for energy or nutrients
- Be objective and non-discriminatory
- Not create obstacles to the free movement of goods

2.4 Previous nutrition labelling legislation

As this study took place during the transition period for nutrition labelling legislation, a summary of previously relevant EU legislation is given here as nutrition labels within store during the study may have shown any of the permitted formats. In previous legislation, nutrition labelling was defined as *'any information appearing on labelling and relating to energy value, protein, carbohydrate, fat, fibre, sodium and defined vitamins and minerals present in significant amounts*'. Nutrition labelling was optional except where a nutrition claim was present, when it became compulsory. Where nutrition labelling was provided, information could be given in two distinct, defined ways – Group 1 (sometimes referred to as the Big 4) provided information about energy/kcal/kJ, protein/g, carbohydrate/g and fat/g) or Group 2 (the Big 8) showing energy/kcal/kJ, protein/g, carbohydrate/g, sugars/g, fat/g, saturates/g, fibre/g, sodium/mg. When a nutrition claim was made for sugars, saturates, fibre or sodium, the Group 2 format had to be used. In addition, information could be provided on starch, polyols, monounsaturated fat, polyunsaturated fat, cholesterol and defined vitamins and minerals present in significant amounts. Nutrition information was required to be expressed per 100g or per 100ml. Information could be provided per serving as quantified on the label or per portion, provided that the number of portions contained in the package was stated. Information could also be presented in graphical form (European Commission 1990).

2.5 UK FOP labelling

Consumers in the UK have access to the most comprehensive range of nutrition labels across Europe. Amongst sweet biscuits, breakfast cereals, ready meals, carbonated soft drinks and yoghurt categories, 96% of products contained back-of-pack nutrition information and 82% of products featured FOP nutrition labels in an audit conducted in 2008-2009 (Storcksdieck genannt Bonsmann S, Celemín LF et al. 2010). The nutrition information provided in the FOP nutrition information panel is displayed in several

different formats, as previously described. In 2013, the Department of Health published detailed guidance to enable food manufacturers and retailers to provide a consistent format for the FOP nutrition information panel, as recommended by UK Health Ministers, with an update published in October 2016 (Department of Health, Food Standards Agency et al. 2013, Department of Health 2016). This format (shown previously in Figure 2.3) must contain the following basic elements:

- Information on the energy value in kilojoules (kJ) and kilocalories (kcal) per 100g/ml and in a specified portion of the product
- Information on the amounts in grams of fat, saturates, (total) sugars and salt in grams, in a specified portion of the product
- Portion size information expressed in a way that is easily recognisable by, and meaningful to the consumer
- % RI information based on the amount of each nutrient and energy value in a portion of the food
- Colour coding of the nutrient content of the food

(Department of Health, Food Standards Agency et al. 2013)

Companies can also include the text descriptors ‘High’, ‘Medium’ or ‘Low’ along with the colours red, amber or green respectively to reinforce their meaning. The provision of this information on food products must adhere to the criteria shown in Table 2.1, with an additional requirement to present the energy figure on a neutral background rather than colour-coded or with associated descriptor text. Similar information regarding the cut-off points for drinks labelling is also available. Figures shown on the panel need to be calculated on a consistent basis, either ‘as sold’ or ‘as consumed’ and guidance for calculating the correct % RI is also specified (Department of Health, Food Standards Agency et al. 2013).

Table 2.1: Criteria for use of colour coding and descriptive text, per 100g of food

Text	LOW	MEDIUM	HIGH	
Colour code	**Green**	**Amber**	**Red**	
Fat	≤ 3.0g/100g	> 3.0g to ≤ 17.5g/100g	> 17.5g/100g	> 21g/portion*
Saturates	≤ 1.5g/100g	> 1.5g to ≤ 5.0g/100g	> 5.0g/100g	> 6.0g/portion*
(Total) Sugars	≤ 5.0g/100g	> 5.0g and ≤ 22.5g /100g	> 22.5g/100g	> 27g/portion*
Salt	≤ 0.3g/100g	> 0.3g to ≤ 1.5g/100g	>1.5g/100g	>1.8g/portion*

*portion size criteria apply to portions/serving sizes greater than 100g

(Department of Health, Food Standards Agency et al. 2013)

Most retailers have provided customer information about the nutrition labelling they have adopted, usually in the form of a written leaflet to pick up in store, via the in-house magazine or on their website. The impact of this information on encouraging use of nutrition labelling amongst consumers is unknown. Nationally, the Change4Life campaign featured information about how to use nutrition labelling, including information on the FOP nutrition information panel, in their TV advertisements during the winter of 2014/15. The thirty second advertisement – called Green is good – contained the following message *'Eating healthy can be confusing. It's hard to know what to buy, especially when we all need a different daily amount of calories but thanks to colour-coded labels, making healthier choices has never been simpler. Just remember, choose less red, go more green instead. And by checking the labels you'll also find it easier to stay inside your calorie limit for the day and it needn't cost you more, nice! So be a smart shopper, go for more green'* (Change4Life 2014).

2.6 The evidence base for nutrition labelling

A significant evidence base exists around nutrition labelling which examines the different approaches used to display the information on pack and how consumers understand and use nutrition labelling. In this section, I consider literature published until 2014 and explore more recently published literature in Chapter 8. Ten relevant literature reviews have been published since 1991, seven of which were systematic (Geiger CJ, Wyse BW et al. 1991, Baltas G 2001, Cowburn G and Stockley L 2005, Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007, Ni Mhurchu C and Gorton D 2007, Campos S, Doxey J et al. 2011, Hawley KL, Roberto CA et al. 2012, Hieke S and Taylor CR 2012, Hersey JC, Wohlgenan KC et al. 2013). Two methodological reviews (Graham DJ, Orquin JL et al. 2012, Vyth EL, Steenhuis IHM et al. 2012) and a protocol for a further systematic review have also been published (Crockett RA, Hollands GJ et al. 2011). Table 2.2 provides a summary description of these reviews - most included studies originate from the USA (where FOP nutrition labelling is uncommon), with smaller numbers of studies being carried out in the UK, Canada and Australia/New Zealand. Reviews from 2007 include studies which reflect the use of the FOP nutrition information panel. The literature is most commonly based on cross-sectional studies and a smaller number of experimental studies, with few studies considering the use of nutrition labels in real-life settings or in the context of broader influences on shopping behaviour. Where reviews have assessed the quality of published literature, this has generally been reported to be limited (Cowburn G and Stockley L 2005, Vyth EL, Steenhuis IHM et al. 2012, Hersey JC, Wohlgenan KC et al. 2013).

In their review of the methodological quality of studies evaluating the effectiveness of front of pack labelling schemes, Vyth *et al* (2012) identified 31 studies, published between 1990 and 2011. Eleven studies used consumer survey methods to gather self-reported data from consumers on their use and understanding of labelling, via different 'experimental' tasks. None of the questionnaires used in the studies were validated. Two

studies used product packages as prompts for discussion in focus group interviews. Vyth *et al* (2012) report that the findings of these types of study are unlikely to be reflective of real-life use (Vyth EL, Steenhuis IHM et al. 2012). Vyth *et al* (2012) found nine studies which used observational methods to measure consumer understanding and use of the FOP label. They found these studies to be of higher methodological quality, as the authors reported it more likely that the findings reflected the real-life concerns of shoppers but also noted the lack of use of validated measures. Six studies in this review examined the impact of front of pack labels on either product sales or product development. Neither of the two supermarket based sales data-related studies had control groups and the studies on reformulation were rated as methodologically weak. Only five studies in the review were categorised as health outcome studies, four of which were modelling studies. One study took place in a real-life context, assessing the impact of a summary logo scheme on dietary salt reduction. Vyth *et al* (2012) concluded that existing research evaluating the impact of FOP labelling schemes is of variable quality, with few methodologically sound studies currently available to inform the evidence base (Vyth EL, Steenhuis IHM et al. 2012).

2.6.1 Research on different approaches to displaying FOP nutrition information

The voluntary nature of front-of-pack labelling provision has allowed for the development of two alternative ways to present nutritional information to consumers. Colour-coding (most typically, traffic light coding) and/or descriptors type formats have been favoured by public health bodies (Lobstein T and Davies S 2009, White J and Signal L 2012) whereas the % RI (or % GDA) format has largely been championed by sectors within the food industry. Opposition to interpretive traffic light colour-coding on the FOP nutrition information panel suggests that some parts of the food industry are reluctant to highlight less nutritious choices - through the use of colour-coding or descriptors of ‘High’ - on the front of pack (Magnusson RS 2010, Kiesel K, McCluskey JJ et al. 2011). Other research suggests that manufacturers are choosing to opt for incomplete disclosure of the

nutritional content of foods on front-of-pack (Carter OBJ, Mills BW et al. 2013). The proliferation of a range of different presentations of the two main formats of FOP nutrition information within stores is thought to be likely to cause confusion for consumers and may impact on the willingness of consumers to engage with the label (Draper AK, Adamson AJ et al. 2013).

One of the key arguments for the use of interpretive FOP information is to simplify the presentation of nutrition information for consumers. While some reviews reported that consumers preferred simplified information (Campos S, Doxey J et al. 2011, Hawley KL, Roberto CA et al. 2012), other reviews have found that consumers preferred more detailed information (Geiger CJ, Wyse BW et al. 1991, Drichoutis AC, Lazaridis P et al. 2006, Hieke S and Taylor CR 2012). Hieke and Taylor (2012) reported that higher levels of detailed information may be preferred by consumers in 'experimental' settings whereas limited real-world evidence suggests that consumers prefer more simplified, easy-to-use information (Hieke S and Taylor CR 2012). There appears to be a general consensus in the reviews that consumers find the interpretation of more detailed information problematic (Drichoutis AC, Lazaridis P et al. 2006, Ni Mhurchu C and Gorton D 2007, Hieke S and Taylor CR 2012, Hersey JC, Wohlgenan KC et al. 2013).

Earlier reviews suggested that there was mixed evidence about which of the main two formats of labels was most helpful for consumers (Baltas G 2001, Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007). Consumers appeared able to locate and retrieve simple information regardless of format but were found to struggle to use numerical information as the complexity of the task increased, like placing a product into a daily diet context (Cowburn G and Stockley L 2005). Drichoutis *et al* (2006) reported that consumers did not perform well using quantitative data and adding simplifying tools helped interpretation (Drichoutis AC, Lazaridis P et al. 2006). Other reviews have suggested that different formats may work better for different tasks or for different sub-groups of consumers (Grunert KG and Wills JM 2007, Campos S, Doxey J

et al. 2011). Colour-coded formats have been reported as preferred by consumers (Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007).

Reviews published more recently have concluded that the provision of multiple traffic light formats and descriptive text is more likely to aid consumers than using numerical information (like % GDA or % RI) alone (Hawley KL, Roberto CA et al. 2012, Hersey JC, Wohlgenan KC et al. 2013). Graham *et al* (2012) also supported this conclusion, finding that colour-coding information is more likely to draw attention to relevant nutrients and to be noticed by consumers (Graham DJ, Orquin JL et al. 2012).

2.6.2 Consumers' use of nutrition information

Reviews consistently report evidence of heterogeneity of label use amongst consumers. Consumers want nutrition information on pack (Baltas G 2001, Grunert KG and Wills JM 2007, Campos S, Doxey J et al. 2011) and are willing to use it (Campos S, Doxey J et al. 2011), especially when confronted with highly processed food or a 'new' product (Grunert KG and Wills JM 2007). Women are more likely to report an interest in label use than men, as are consumers who are 'health' motivated or 'nutrition' aware, for example, due to the requirements of a health condition (Baltas G 2001, Cowburn G and Stockley L 2005, Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007, Campos S, Doxey J et al. 2011, Hieke S and Taylor CR 2012). The reviews consistently report a positive attitude towards diet and health as a predictor of consumer search and use of nutrition label information (Baltas G 2001, Cowburn G and Stockley L 2005, Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007, Campos S, Doxey J et al. 2011, Hieke S and Taylor CR 2012, Hersey JC, Wohlgenan KC et al. 2013).

Consumers with greater nutrition knowledge are also more likely to use nutrition labels (Cowburn G and Stockley L 2005, Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007, Campos S, Doxey J et al. 2011, Hieke S and Taylor CR 2012).

Table 2.2: Reviews of nutrition labelling since 1991

Author	Stated aim	Review type (defined by author)	Number and origin of included papers	Publication dates of included papers	What is included in definition of nutrition labelling?
Geiger *et al,*1991	To examine nutrition labelling history and the findings of studies into nutrition labelling formats	Narrative review (Abstract only)	9	From 1971	Back-of-pack nutrition information panels
Baltas, 2001	To explore theoretical approaches, determinants of label use, consumer understanding of on-pack nutrition information, organisation and presentation of on-pack nutrition information and nutritional labelling and purchase behaviour	Narrative review	Refers to 55	Not stated	Back-of-pack nutrition information panels Summary nutrition/health logos Nutrition/health claims
Cowburn & Stockley, 2005	To explore published and unpublished research into consumer understanding and use of nutrition labelling which is culturally applicable In Europe	Systematic review	103	Until June 2002	Back-of-pack nutrition information panels Summary nutrition/health logos
Drichoutis, Lazaridis & Nayga, 2006	Reviews the literature and addresses determinants of label use, mandatory labelling debate, label formats preferred by consumers, effect of nutrition label use on purchase and dietary behaviour	Narrative review	Refers to 100	Not stated	Back-of-pack nutrition information panels
Grunert & Wills, 2007	To review research conducted in 2003-2006 in the EU-15 countries on how consumers perceive, understand, like and use nutrition information on food labels	Systematic review	58	2003-2006	Back-of-pack nutrition information panels Front-of-pack nutrition information panels Summary nutrition/health logos Nutrition/health claims
NiMhurchu & Gorton, 2007	To determine how well consumers use and understand nutrition labels and claims in New Zealand and Australia	Systematic review	16	Until mid-2005	Back-of-pack nutrition information panels Summary nutrition/health logos Nutrition claims
Campos, Doxey & Hammond, 2011	To examine the prevalence of consumer use and understanding of nutrition labels and the impact of nutrition labelling on consumer dietary habits	Systematic review	120	Until 2010	Back-of-pack nutrition information panels Front-of-pack nutrition information panels Summary nutrition/health logos Nutrition claims

Table 2.2: Reviews of nutrition labelling since 1991

Author	Stated aim	Review type (defined by author)	Number of included papers	Publication dates of included papers	What is included in definition of nutrition labelling?
Crockett *et al*, 2011	To assess whether nutritional labelling of foods promotes healthier food purchasing behaviour from a) restaurants, b) food shops and c) vending machines and healthier food consumption behaviour	Cochrane systematic review		Protocol	Back-of-pack nutrition information panels Front-of-pack nutrition information panels
Hieke & Taylor, 2012	What helps consumers to understand labelling information, and has the regulation of nutritional labelling helped consumers be better informed and to change behaviour?	Systematic review	47	Until 2011	Back-of-pack nutrition information panels Front-of-pack nutrition information panels Summary nutrition/health logos Nutrition/health claims
Hawley *et al*, 2012	To evaluate existing research to identify FOP/shelf labelling systems which hold the most promise and to identify research needs	Systematic review	28	2004-Feb 2011	Front-of-pack nutrition information panel Summary nutrition/health logos
Vyth *et al*, 2012	To provide a review of the methodological quality of current Front-of-pack labelling research	Structured (not systematic) review	31	1990-Feb 2011	Front-of-pack nutrition information panels Summary nutrition/health logos
Graham, Orquin & Visschers, 2012	To review all published eye tracking methodology studies, identify directions for further research and make recommendations for how labels could be modified to improve consumers' ability to use them	Narrative review	9	Until 2011	Front-of-pack nutrition information panels
Hersey *et al*, 2013	To consider consumer responses to FOP nutrition labelling (and shelf-labelling) schemes to inform the development of a US federal standard for FOP labelling	Systematic review	38, 22 of which referred to FOP nutrition panels	Jan 1990-September 2010	Front-of-pack nutrition information panel Shelf label schemes

Most, but not all, studies reported that individuals with greater education report higher levels of label use (Baltas G 2001, Cowburn G and Stockley L 2005, Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007, Campos S, Doxey J et al. 2011, Hieke S and Taylor CR 2012) although more educated consumers may choose not to use nutrition labels but rely on their existing knowledge to guide food selection (Hieke S and Taylor CR 2012). Mixed findings have been reported relating to the impact of age on label use, with some studies reporting no effect but others suggesting that label use declines with increasing age. Some evidence points to older adults being more likely to be interested in label information due to an increased concern around health but other studies found that older consumers were likely to find location and retrieval of nutrition information more difficult than their younger peers and less likely to perform well in tests of objective understanding (Baltas G 2001, Cowburn G and Stockley L 2005, Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007, Campos S, Doxey J et al. 2011, Hieke S and Taylor CR 2012). Some evidence suggests that households with young children are more likely to express interest in using nutrition information (Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007, Campos S, Doxey J et al. 2011, Hieke S and Taylor CR 2012) although this has not been a consistent finding, with Hersey *et al* (2013) reporting that consumers with children living in their households were less likely to use FOP labels (Hersey JC, Wohlgenan KC et al. 2013). Consistent findings do suggest that typical label users are less price-sensitive and also have more time available for grocery shopping than non-label users (Baltas G 2001, Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007, Campos S, Doxey J et al. 2011, Hieke S and Taylor CR 2012). Grunert and Wills (2007) found that some consumers trade off issues relating to price, taste and enjoyment against health and nutrition concerns (Grunert KG and Wills JM 2007). Consumers report looking at fat and energy information ahead of other nutrients (Grunert KG and Wills JM 2007, Campos S, Doxey J et al. 2011, Hawley KL, Roberto CA et al. 2012) although salt and sugar also ranked highly for some consumers (Grunert KG and Wills JM 2007).

Figure 2.5 shows a framework of factors which are said to influence nutrition label use, adapted from models suggested by Drichoutis *et al* (2006) and Grunert & Wills (2007) (Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007). Grunert *et al* (2010) develop these concepts further to suggest that consumers' use of labels is affected by their nutrition knowledge and interest in healthy eating, which impacts on the inference they make about the healthiness of a product. They propose that this information is integrated with other information about a product (such as taste or price) to form an overall evaluation, which informs a decision about whether or not to purchase (Grunert KG, Wills JM et al. 2010).

2.6.3 Impact on food purchases and dietary behaviour

Modelling studies have suggested a possible link between reported use of nutrition information and consumption of added sugar (Weaver D and Finke M 2003) and report that consumption of a diet which complies with FOP labelling criteria could have a beneficial effect on cholesterol levels (Vyth EL, Hendriksen MA et al. 2012). But these findings have not been replicated in real-life contexts. Sacks *et al* (2009) found no effect following the introduction of a FOP labelling system on the healthiness of purchases in their short-term study of ready meals and sandwiches (Sacks G, Rayner M et al. 2009). Early indications suggest that a systematic review on the impact of nutrition labelling on food purchasing is likely to demonstrate no overall effect, although this research has not yet been published in a peer-reviewed journal (Crockett RA, Hollands GJ et al. 2011, Crockett R 2014).

Evidence from other reviews about the impact of using nutrition labelling on purchasing and diet appears equivocal. Baltas (2001) suggested that consumers report that nutrition labelling influences their purchases, at least sometimes (Baltas G 2001). Drichoutis *et al* (2006) found limited evidence to suggest that label use is associated with healthier patterns of dietary behaviour and food choice motivations (Drichoutis AC, Lazaridis P et

al. 2006). Grunet and Wills (2007) agreed that there was some evidence that nutrition labels influenced healthier purchase intentions but reported that this influence may be product-specific and that other factors (such as appearance, taste, convenience and brand loyalty) may be stronger influences (Grunert KG and Wills JM 2007). Campos *et al* (2011) found a consistently reported association between use of labels and healthier diets, suggested preliminary evidence points towards FOP labels promoting healthier food purchasing and concluded that the provision of nutritional information on pack has a positive impact on diet (Campos S, Doxey J et al. 2011). Hawley *et al* (2012) and Hersey *et al* (2013) report that only limited research exists, with mixed results, furthering calls for more research, especially related specifically to FOP nutrition label information (Philipson T 2005, Hawley KL, Roberto CA et al. 2012, Storcksdieck genannt Bonsmann S and Wills JM 2012, Hersey JC, Wohlgenan KC et al. 2013, Lachat C and Tseng M 2013). In their published protocol for a randomised controlled trial, Volkova *et al* (2014) describe plans for an investigation into the effect of different FOP nutrition labels on the healthiness of food purchases in New Zealand adults (Volkova E, Neal B et al. 2014), so this research gap might begin to be addressed in future.

2.7 Limitations of current evidence

Despite a substantial literature, and some existing tools to assess consumers' use, understanding and perception of food labels (Mackison D, Wrieden WL et al. 2010), there still remains much to learn about consumer understanding and use of nutrition labels and its impact on purchasing behaviour. Persistent calls have been made for studies to be conducted in real-life settings when people are making real food choices (Cowburn G and Stockley L 2005, Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007, Wills JM, Schmidt DB et al. 2009, Hawley KL, Roberto CA et al. 2012, Hieke S and Taylor CR 2012, Vyth EL, Steenhuis IHM et al. 2012, Hersey JC, Wohlgenan KC et al. 2013, Lachat C and Tseng M 2013). Self-report measures by consumers suggest high levels of use of nutrition labels, with use typically more than 50% of the study populations,

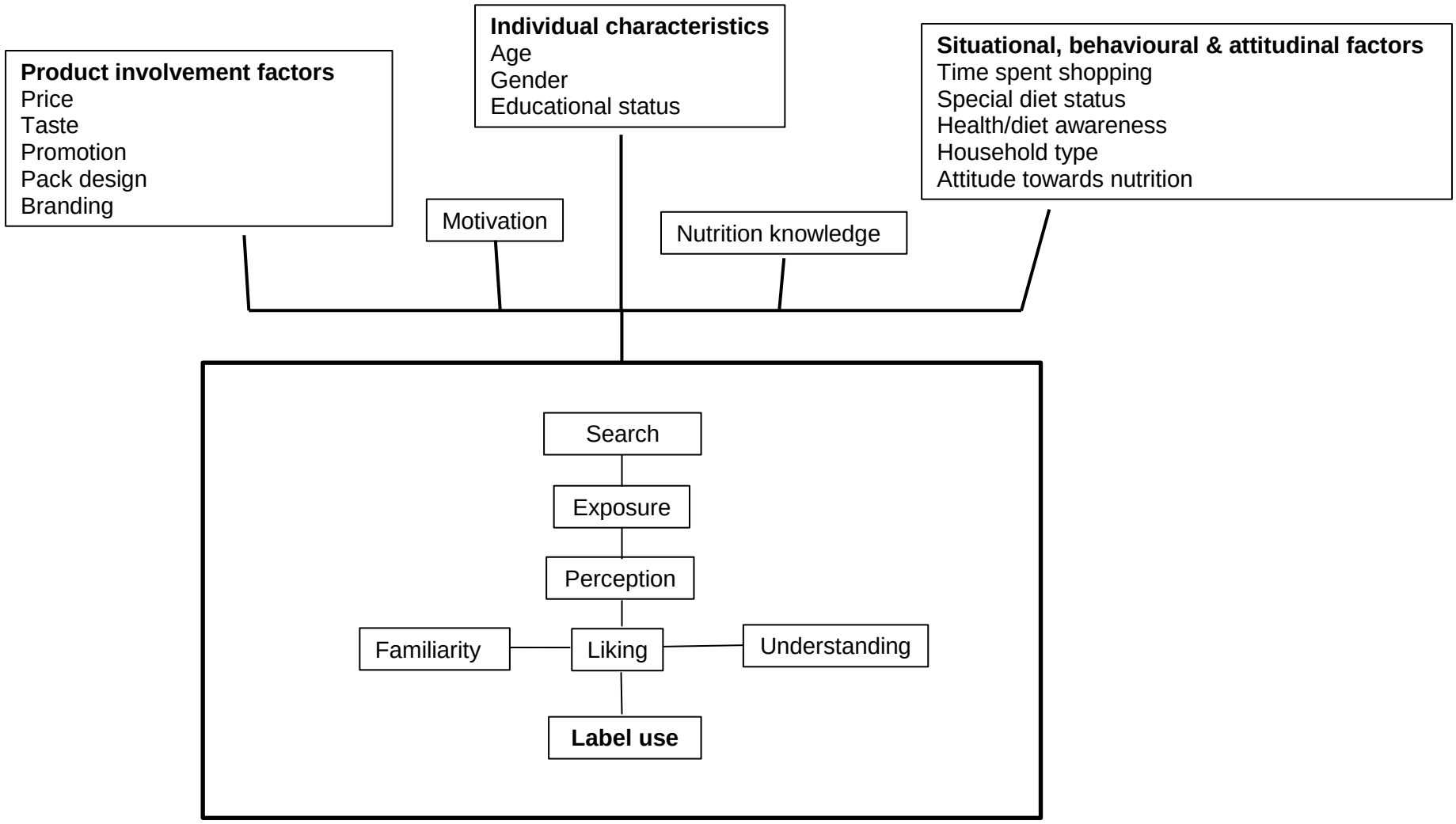
according to Campos *et al* (2011) (Campos S, Doxey J et al. 2011).Studies using 'Think aloud' and other observational measures find that actual usage amongst consumers is lower (Cowburn G and Stockley L 2005, Ni Mhurchu C and Gorton D 2007, Grunert KG, Wills JM et al. 2010). Why are consumers not using nutrition labels as often as they report?

As an intervention, the FOP nutrition information panel is designed to offer shoppers a convenient, simplified source of information in addition to mandatory BOP provision. As much of the existing literature reflects studies conducted in artificial circumstances, a research gap exists about how shoppers actually apply the information provided in the FOP nutrition panel in a real-life context, when making real food purchasing decisions. The study described in this thesis makes a contribution to addressing this knowledge gap. For nutrition labelling to assist consumers in choosing healthier foods, they first need to identify and attend to the information before interpreting it to make one (or more) of the following decisions about a product:

- identify the amount of a specific nutrient a product contains
- assess what counts as a high or low amount of a nutrient in the product
- decide the overall healthiness of a product
- compare a specific nutrient (or the overall nutrient content) of a product with one or more similar products or between different types of products
- calculate the amount of a nutrient eaten in a serving
- assess the product in the context of a meal choice or daily intake

(Cowburn G and Stockley L 2005).

Figure 2.5: Factors influencing nutrition label use



Adapted from Drichoutis et al, 2006 and Grunert & Wills, 2007

Although consumers seem to be able to achieve some (or most) of these tasks in an 'experimental' context, little is known about their ability to transfer these skills into a real-life setting. How do consumers actually use the FOP nutrition information panel to guide their purchasing when they do their own shopping? The study which is described in the following chapters sets out to explore this question.

3. METHODS

3.1 Introduction

This chapter presents a description and rationale for the methods chosen to answer the thesis research questions. The exploratory nature of my research questions suggested that using qualitative methods would be most appropriate. As Adler and Adler report, qualitative studies seek *'to generate a subjective understanding of how and why people perceive, reflect, role-take, interpret, and interact'* (Baker SE and Edwards R 2012).

My research was funded as part of a larger award to the British Heart Foundation Centre on Population Approaches for Non-Communicable Disease Prevention through the National Preventative Research Initiative (MR/J000256/1) (Medical Research Council 2010): The Front of pack food Labelling: Impact on Consumer Choice (FLICC) project. This was a collaborative project involving the University of Oxford, University of Surrey, Queen's University Belfast, Dublin City University and the University of Auckland which aimed to investigate how people use FOP nutrition labelling to influence food purchasing decisions and to explore whether the effect of FOP nutrition labelling can be amplified with education and tailored feedback to consumers (Scarborough P, Hodgkins C et al. 2015). I was a co-applicant on this grant, devised and wrote the qualitative study elements within the proposal which formed Phase 2 of the study and was funded part-time to undertake Phase 2 of the FLICC study.

The data generated from Phase 2 was used to answer my thesis research questions. My focus was two-fold. Firstly, I wanted to conduct investigative research into whether, how and why shoppers use (or fail to use) the FOP nutrition information panel in a real-life context. Secondly, I wanted to undertake a methodological study to explore the contribution the use of a novel method of data capture (wearable cameras) could make to this understanding. The primary focus of my research was to explore and understand the

lived experiences of shoppers as they negotiated a routine food shop, in order to uncover what factors influenced their thought processes and how and why they made decisions relating both to their food purchasing and in relation to their engagement with the FOP nutrition information panel. Pope and Mays (1995) describe the goal of qualitative research as *"the development of concepts which help us to understand social phenomena in natural (rather than experimental) settings, giving due emphasis to the meanings, experiences and views of all the participants"* (Pope C and Mays N 1995). As I hoped to uncover a range of possible perspectives and factors affecting decision making within this context, the choice of a qualitative methods approach appeared most appropriate to achieve this aim. Ritchie *et al* (2003) divide data from qualitative research methods into two distinct categories - naturally occurring data and generated data - with naturally occurring data defined as *"an 'enactment' of social behaviour in its own social setting"* and generated data referring to a retelling of experiences (Ritchie J, Lewis J et al. 2013). I planned to use both categories of data to answer my research questions - naturally occurring data (from observations of participants either as they undertook their shop, or from viewing their wearable camera images) and generated data (from individual interviews with participants once they had completed their shop). Observation methods allow researchers to view the experiences of participants and this observation can offer insight into an experience as it is occurring. Although focus groups, which gather a group of people together and use group dynamics to explore a topic of interest, are frequently used as a method to gather a consensus understanding about specific issues (Kitzinger J 1995), I chose to use individual interviews as a means to generate data. Edwards and Holland (2013) report the value of individual interviews as offering an opportunity for an interactional, adaptable and flexible exchange between the researcher and participant which can lead to a rich understanding of attitudes and behaviours (Edwards R and Holland J 2013). I have previous experience in the use of individual interviews and wanted to use this approach for this study because I hoped that interviews would help me to gain a specific and detailed insight into each participants own perspectives and

interpretation of their decision making behaviour around food purchasing and their views on the role that the FOP nutrition information panel might have on these decisions. Specifically, I aimed to use a semi-structured interview approach which uses a loose structure of open-ended questions to define areas of interest, but which can be adapted as required by individual responses (Britten N 1995). This approach offered the flexibility to explore particular areas of interest in depth, to understand the values which participants attached to their behaviours, to clarify areas of misunderstanding and to introduce 'product' prompts, where these were necessary to encourage further in-depth consideration of FOP nutrition labelling.

3.2 The 'Think aloud' method

Previous research in supermarket settings has used the 'Think aloud' method to explore the use of nutrition labelling and decision making around different types of food purchase (Rayner M, Boaz A et al. 2001, Higginson C, Kirk TR et al. 2002, Reicks M, Smith C et al. 2003, Barnett J, Vasileiou K et al. 2013, Hollywood LE, Cuskelly GJ et al. 2013). The 'Think aloud' method involves researcher observation of participants, alongside participants verbalising their thoughts as they complete a particular task, with thoughts being audio-recorded for subsequent analysis (Fonteyn ME, Kuipers B et al. 1993, Charters E 2003). Charters 2003, in her review of the method, reports the 'Think aloud' technique as an effective means of accessing high-level thinking processes (Charters E 2003). Ericsson and Simon (1993) report that participants *'can generate verbalisations, subordinated to task-driven cognitive processes (think aloud), without changing the sequence of their thoughts, and slowing down only moderately due to the additional verbalisation'* (pxxxii, Preface) (Ericsson K and Simon H 1993), thus suggesting that 'Think aloud' is a reliable method for gathering information about what participants are thinking in that moment (Ericsson K and Simon H 1993).

Rayner *et al* (2001), in their study examining how consumers use health-related food endorsement labels in the UK and Australia, reported the 'Think aloud' method as a useful means by which to move beyond attitudinal and self-report research to explore actual use of endorsement labelling at point-of-purchase (Rayner M, Boaz A et al. 2001). Similarly, Barnett *et al* (2013) reported the value of 'Think aloud' as a mechanism to access information about the label reading and shopping practices of people with nut-allergies, rather than relying solely on self-reported accounts (Barnett J, Vasileiou K et al. 2013). In a study using the 'Think aloud' method to explore fruit and vegetable purchasing behaviours in low-income African American mothers, Reicks *et al* (2003) reported that the method provided a useful insight into decisions made at point-of-purchase but raised concern about potential reactivity to the 'thinking aloud' process and/or the presence of the interviewer in a population group less accustomed to taking part in research (Reicks M, Smith C et al. 2003). Reactivity is a type of 'observer effect' where the behaviour of participants' may be altered as a consequence of being observed. McCambridge *et al* (2014) suggest that the effect of being observed *'engenders beliefs about researcher expectations. Conformity and social desirability considerations then lead behaviour to change in line with these expectations'* (McCambridge J, Witton J et al. 2014). The implication that such alterations in behaviour may be problematic is contested by some qualitative researchers who argue that changes can offer interesting insights, providing researchers are sensitive to, and take account of, the implications of these changes when they interpret the data (Monahan T and Fisher JA 2010).

I chose to use the 'Think aloud' method as one way to capture data from participants in this study. My study protocol (see Appendix 1) was informed by both the published literature in this area and by informal discussion with colleagues who had been involved with these studies, and so reflects the combined knowledge of key researchers who have utilised 'Think aloud' in food-based supermarket research. It incorporates several features of 'good practice' (such as enabling participants to practice 'thinking aloud' prior to their

shop; guidance on researcher-prompts to participants; allowing participants' to direct their 'thinking aloud' towards the researcher but not entering into conversation with them) which attempt to reduce the impact of the presence of the researcher and so limit reactivity to the method. In addition, again informed by some of the previous supermarket-based studies which had used the 'Think aloud' method and also to mimic the participant experience for the other data capture method I planned to use, I added a post-shop interview following the 'Think aloud' shop.

3.3 Wearable cameras

I wanted to use wearable cameras as the other 'novel' method of data capture for the study. Figure 3.1 shows images of the Autographer and Tobii eye-tracking glasses (Curtis S 13/08/2013) (Tobii.com 2013). Autographer, a wearable digital camera, automatically takes time-stamped, first-person point-of-view still images without any action required from the wearer (OMG Life 2013). Similarly, Tobii eye-tracking glasses automatically record 'video' style images, as seen by the wearer (Tobii.com 2013). Initially, I planned to use the Autographer device (with which I had previous experience) but I was also offered the opportunity to pilot the use of the Tobii device, on loan from Dublin City University.

Figure 3.1: The Autographer and Tobii eye-tracking glasses (wearable camera devices)

Autographer

Source: http://www.autographer.com/photography

Tobii eye-tracking glasses

Source: http://www/tobii.com

Eye-tracking technology has been used commercially to inform developments in car manufacturing, medical technology, the defence industries and in advertising, entertainment, packaging and web design (Eye-tracking Inc 2016). It has also developed into a method used to study nutrition information labels although these studies are most commonly computer-based simulation studies (Graham DJ and Jeffery RW 2011, Graham DJ and Jeffery RW 2012, Graham DJ, Orquin JL et al. 2012, Antúnez L, Vidal L et al. 2013, Ares G, Giménez A et al. 2013) whereas I wanted to test the eye-tracking technology in a real-life context. To my knowledge, only one other non-commercial study has explored the use of this technology in a supermarket setting (Rawson D, Janes I et al. 2008). This pilot study investigated the potential of eye-tracking as a technique to gather data about food labelling and reported that further research using this technology could make a useful contribution in understanding how people map and use food labels (Rawson D, Janes I et al. 2008).

There is growing interest in the use of wearable technology as a means to examine dietary behaviour. Wearable cameras have shown promise as a method of data collection in studies aiming to improve the assessment of dietary intake in adults (Arab L, Estrin D et al. 2011, Chen J, Marshall SJ et al. 2013, Gemming L, Doherty A et al. 2013, O'Loughlin G, Cullen SJ et al. 2013) although technological developments still require further refining (Sun M, Burke LE et al. 2015). I have previously been involved in a study to investigate the feasibility and acceptability of using wearable cameras as a method to capture the opportunities for food and drink purchasing/consumption that young people encounter on their regular journeys to and from school (Cowburn G, Matthews A et al. 2015). I was keen to continue to develop a stream of research around food-related behaviour and the use of this data capture method.

Rather than focus on the role of wearable cameras in dietary assessment, I chose to use wearable cameras to explore two issues. Firstly, I was interested to understand how viewing wearable camera images could aid researchers understanding of participants'

recall of their purchasing decisions. Preliminary studies have shown that wearable camera images provide powerful memory cues (Berry E, Hampshire A et al. 2009) and interviews guided by photographs have provided unique insights around food purchasing behaviour in adults (Koenigstorfer J and Groeppel-Klein A 2010). In our previous study, we found that viewing wearable camera images prompted detailed discussion and generated contextually specific information which was helpful in understanding the decisions the participants were making (Cowburn G, Matthews A et al. 2015).

Secondly, I wanted to use wearable cameras to explore the issue of reactivity. Although reactivity to any method of data collection is unlikely to be entirely removed (and, as previously indicated, may not be necessary) it has been suggested that the use of non-invasive data capture techniques may help to reduce its impact (Nguyen D, Marcu G et al. 2009, Sun M, Burke LE et al. 2015). By capturing images passively, wearable cameras act as an indirect observation method which may make them a less intrusive tool than direct observation methods like 'Think aloud'.

3.4 Ethics

Ethics approval was obtained from the University of Oxford Central University Research Ethics Committee in May 2013 (reference number MSD-IDREC-C1-2013-087, see Appendix 2). It also received clearance from the University of Surrey ethics committee.

3.5 Sampling

3.5.1 Study location

The study took place in two stores of a national supermarket chain which were located in the South East of England. The stores were selected with the assistance of the Consumer Insight team at the head office of the participating supermarket chain. To be eligible for consideration, stores needed to:

- be of a sufficient size to ensure that a range of own-brand pre-packed product categories, which carry FOP nutrition information labels, were stocked
- have an attached car park to accommodate 'weekly' shops along with convenience 'top-up' shops
- attract a mixed population in terms of age and income
- be accessible geographically for research team
- have a quiet space which could be screened from other shoppers where post-shop interviews with participants could take place
- have the agreement of the store manager for the research to take place over several months

The two selected stores met these criteria. Store 1 was situated on the main road in a suburb of a large town. It had a gross selling space of 7089 square feet and a customer base of 66% from social class ABC1 and 34% from social class C2DE (Participating supermarket - Personal Communication 2013). Store 2 was situated on the main road of a small town, within a rural setting. It had a larger gross selling space than Store 1 (13,147 square feet) with 11% of its customer base being classified as high affluence, 71.7% of customers classified as medium affluence and 17.3% of customers classified as of low affluence (Participating supermarket - Personal Communication 2014). These stores are similar in nature to a typical store within the participating supermarket chain (Name of participating supermarket 2014).

3.5.2 Recruitment

There were few available examples of similar research to guide the recruitment approach because the study combined two elements – a setting where little health-based research is publically available (Mozaffarian D, Afshin A et al. 2012) and the use of novel data collection methods.

Ball *et al* (2011) used a targeted mail out and a local newspaper media release in their efforts to recruit women shoppers to take part in the SHELf (Supermarket Healthy Eating for Life) study, a randomised controlled trial to test skills-building and price reduction interventions in a chain of supermarkets in Melbourne, Australia (Ball K, McNaughton S et al. 2011). Similarly, Ni Mhurchu *et al* (2009) used mailed invitations to recruit shoppers to their Supermarket Healthy Options Project (SHOP), a randomised controlled trial to test the effects of tailored nutrition education and price discounts, but needed to boost this approach by using in-store recruitment and community engagement in order to recruit indigenous and minority ethnic participants, who were a key target of their intervention (NiMhurchu C, Blakely T et al. 2009). The use of postal invitation seems an appropriate recruitment choice in these instances, as both of these studies were attempting to recruit large samples of participants.

Customer intercept at various stages of the supermarket visit, as used by Ni Mhurchu and colleagues, is a commonly used recruitment technique documented in other supermarket-based studies. In a study to investigate the efficacy of a multi-component point-of-purchase intervention and a nested study to explore the relationship between the energy and nutrient content of freely chosen supermarket purchases and socio-economic status, participants were recruited via researcher intercept at the store entrance (Appelhans B, Milliron B et al. 2012, Milliron BJ, Woolf K et al. 2012). Similarly, potential participants were approached by researchers as they entered the store in a study to assess the efficacy of a store-based intervention to increase the fruit and vegetable intake of customers using *tiendas* (small to medium sized Latino-food stores) in Central North Carolina (Ayala GX, Baquero B et al. 2013) and customers were intercepted in store in a study to evaluate a multi-faceted intervention promoting diet and the prevention of cancer (Light L, Tenney J et al. 1989). Following in-store observation, shoppers who had selected at least one item from particular product categories were approached to take part in an interview about the item/s they had chosen in a study to investigate the use of

nutrition information on food labels in six European countries (Grunert KG, Fernández-Celemín L et al. 2010). Potential participants were approached by researchers after they had completed their shopping in a study assessing actual use of a front-of-pack nutrition logo in supermarkets in the Netherlands (Vyth EL, Steenhuis IH et al. 2010). Every fifth respondent encountered was approached for recruitment in the Navajo Healthy Stores study designed to increase the availability of healthier foods in local food stores (Gittelsohn J, Kim EM et al. 2013). Researchers selected potential participants by approaching the first age-eligible shopper to exit the store at five-minute intervals in the evaluation of the Four Heart supermarket program of the Pawtucket Heart Health Program (Hunt MK, Lefebvre RC et al. 1990).

I planned to purposively sample shoppers, with a view to obtaining a maximum variation sample (Patton MQ 2002). A purposive sample is created using a non-probability sampling technique where the sample is selected based on the knowledge of a population in relation to the purpose of a study (Crossman A 2015). The goal of purposive sampling is to focus on the particular characteristics of a population of interest in order to answer specific research questions (Lund Research Ltd 2012). Maximum variation sampling attempts to capture both diverse and common perspectives, by specifically seeking information from a range of people of different ages, backgrounds and experiences (Creswell JW 2007, Al-Busaidi ZQ 2008). My approach was to accept all volunteers for participation but to reference participant characteristics against several factors known from the existing evidence base to be important in relation to use and understanding of nutrition labels (including age, gender, educational achievement, income, household type etc.) to ensure a wide variety of participants.

I planned to continue to collect data until saturation was achieved. Data saturation is said to occur *"when researchers sense they have seen or heard something so repeatedly that they can anticipate it. Collecting more data is deemed to have no further interpretive*

value" (Sandelowski M 2008). However, it has been argued that achieving data saturation is unrealistic (O'Reilly M and Parker N 2012) and understanding (and demonstrating) when saturation has been achieved is problematic (Guest G, Bunce A et al. 2006, Bowen GA 2008, Mason M 2010, Baker SE and Edwards R 2012). In addition, data saturation is not the only factor which influences the number of interviews undertaken. This can also be limited by time, resources and practicalities (Green J and Thorogood N 2004). However, the concept of saturation is seen as an important part of demonstrating rigor for some disciplines of qualitative research (Tracy SJ 2010) and I planned to aim for it, bearing in mind that there were some limitations to the time and researcher resources available to complete the data capture in this study. Data saturation was estimated at the outset to require a sample of between 30-50 participants (Pope C, van Royen P et al. 2002).

Shoppers were eligible for inclusion in the study if they:

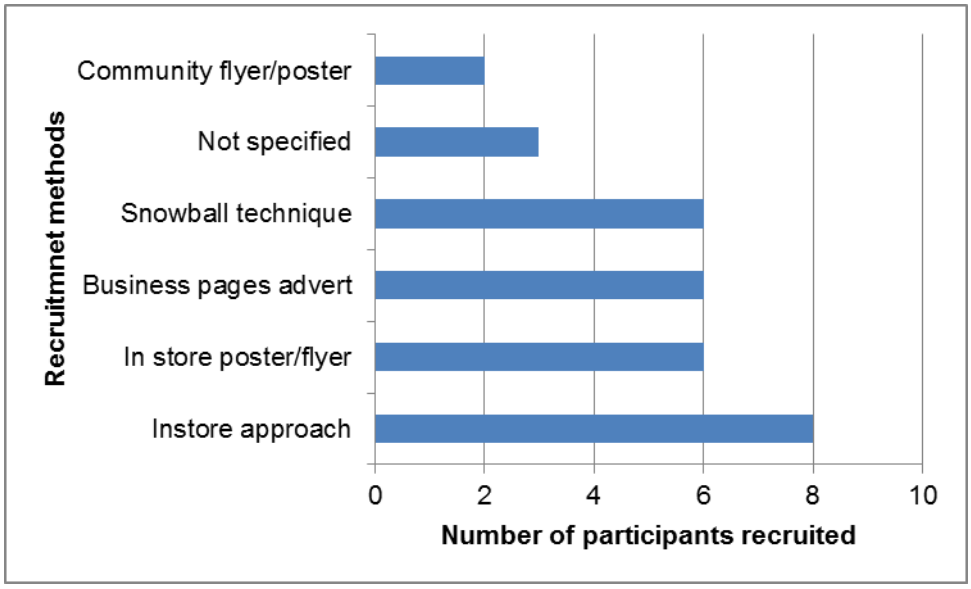
- were aged 18 or over
- regularly used the study supermarket for their routine shopping
- planned to undertake a basket or trolley food shop in the study supermarket within the next month which reflected a selection of typically/usually chosen and purchased food products
- sometimes purchased pre-packed foods

Given the small number of participants I hoped to recruit in total, the use of locality-based and in-store recruitment approaches seemed appropriate and practical. Potential participants were recruited using a range of active and passive methods (Foster C, Brennan G et al. 2011). The approach, for both stores, was to advertise in the area surrounding each store with leaflets, flyers and an advertisement in the local freely distributed business pages (see Appendix 3). With agreement of the store, posters were placed in store and flyers giving details of the study were placed at till ends. The research

team also discreetly approached people who had already completed their shopping on the occasions when data was being collected in store. Once potential participants had agreed to take part, I used a 'snowball' technique as an informal method for reaching other potential participants, by asking participants to encourage other people known to them to consider participation (Atkinson R and Flint J 2001). In total, thirty one participants took part in the study. Figure 3.2 shows the number of participants recruited via the various methods used.

Potential participants were given the study information sheet (see Appendix 4) and the consent form (shown in Appendix 5) either in store, by email or post. Potential participants were not told that the primary focus of the study related to the FOP nutrition information panel. Instead the study information sheet stated that the purpose of the study was 'exploring decisions made during routine supermarket shopping'. After initial contact, potential participants were contacted either by email or post (based on their preferred contact method, established during the initial point of contact) on up to three occasions. This contact was intended to remind them of their expressed interest in the study and to encourage their participation.

Figure 3.2: Number of participants recruited via different recruitment methods



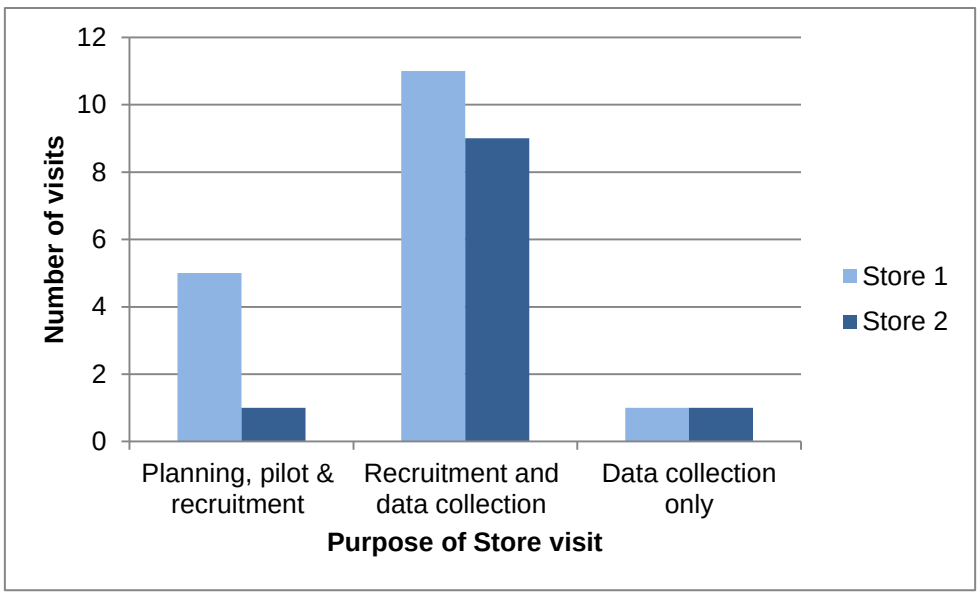
Of the 107 people who initially expressed interest in the study, 66 chose not to participate. Those people who declined to take part were invited to complete a brief non-participation questionnaire (shown in Appendix 6). Table 3.1 shows the reasons given for non-participation amongst the seven non-participants (11%) who responded to the non-participation questionnaire.

Initial plans were to use a single store for data collection. As recruitment progressed it became clear that recruiting sufficient participants would be a challenge from only one store. Store 1 is a local store for quite a small community of shoppers and, over time, it appeared that the most likely candidates for participation had been approached. Adding a second store turned out to have two benefits for the study. Firstly, we were able to attract interest in a new pool of customers and secondly it increased the likelihood of recruiting a variety of people into the study. Figure 3.3 shows the number and purpose of the visits made to the two stores. Recruitment started in Store 1 in September 2013 and data collection was completed by June 2014. Two of the twelve data collection visits to Store 1 yielded no data, as participants failed to attend their scheduled appointments. Recruitment in store 2 commenced in May 2014 and concluded in September 2014. Four data collection visits failed to yield data, again due to participant drop out.

Table 3.1: Reasons given for non-participation in study

Reasons given for non-participation (questionnaire items)	Number	Comments
I didn't like the idea of being observed around the store when I was shopping	4	*"I did not realise I would have to be followed around the store… which unfortunately put me off the idea"*
I didn't like the idea of being recorded	4	*"Finding out why we buy the things we do is something that I am very interested in, (my professional career is in home economics) which is why I was initially interested to be part of the research, however the thought of walking round a supermarket with a researcher in tow and wearing a head piece is a step too far for me, sorry"*
I thought it would take up too much of my time	3	*"Although I think this is a worthwhile exercise, my main reason for declining to participate is that I have too many other demands upon my time at present"*
I didn't like the idea of wearing a camera	3	
I didn't like the idea of wearing the special glasses	3	
The research sounded like a lot of effort for me	1	
Other	3	*"Coincidentally my old employer has asked if I could return to work for a few weeks until the end of the year so I won't have the time to contribute now"* *"I don't buy ready-meals at the [store] so I don't think we can go any further"* *"Although we visit the [store] a couple of times each week we don't buy a regular weekly shop, but rather purchase odd items as required e.g. milk, bananas. We also look for reduced bargains in the bakery and meat sections. So our purchases, we believe, are not representative of a typical weekly shop."*

Figure 3.3: The number and purpose of store visits



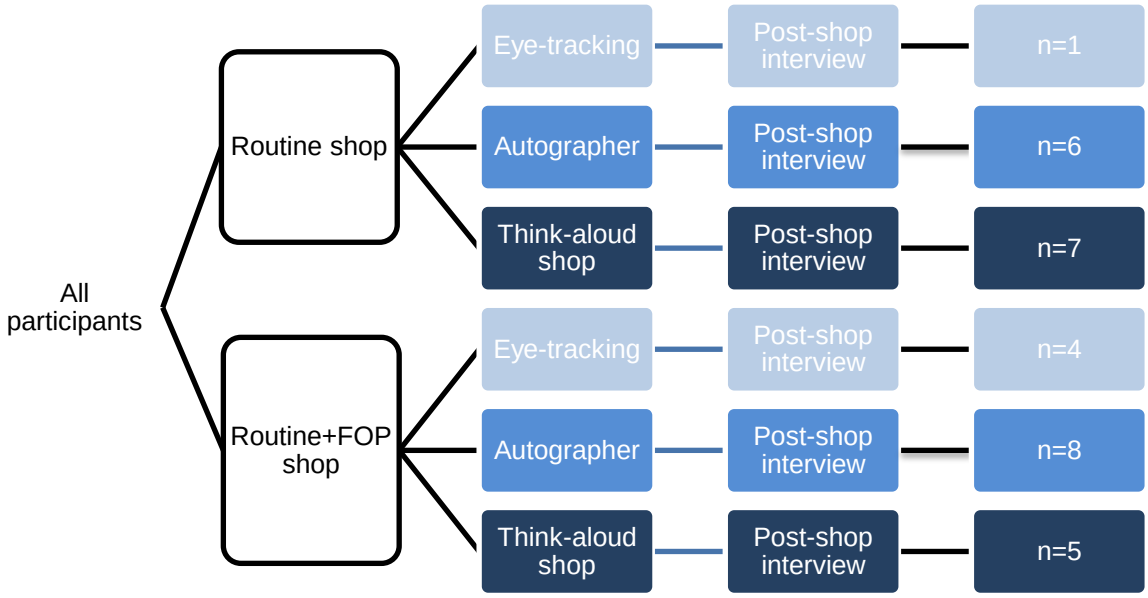
3.6 Data collection

3.6.1 Overview

I led a team of 3 experienced researchers in the data collection for the study, although I collected the majority of the data (from 23 participants, with the two other researchers collecting data from four participants each). Once shoppers had consented to take part in the study, I assigned them to one of two shopping types – a 'Routine' shop or a 'Routine+FOP' shop. 'Routine+FOP' participants were asked to use the FOP nutrition information panel during their shop whereas 'Routine' shop participants were invited to proceed to shop in their normal way, without mention of using any label information. The decision to ask some participants to use the FOP nutrition information panel was influenced by two factors: the previous experience of researchers involved in the larger FLICC study and existing literature, both factors suggested that actual use of the FOP nutrition information panel, without direction, would be limited (Higginson C, Kirk TR et al. 2002, Cowburn G and Stockley L 2005). Participants were divided equally to the two different types of shop unless they indicated during recruitment that they were known to other participants from whom data had already been collected. In this instance, participants were allocated to the 'Routine+FOP' shop, given the possibility that the focus of the study may have been discussed. I also allocated the data collection method to each participant with the goal of allocating equal number of participants to each data collection method. In practice, this was influenced by a number of factors – whether or not participants wore glasses to shop (which meant they could not be allocated the eye-tracking glasses for technical reasons), the availability of the eye-tracking glasses (which were on loan for a limited period), any stated participant preference and practical issues like the research team available on specific days of data collection. Figure 3.4 shows the allocation of participants by shopping type and data collection method.

An appointment convenient to the participant was arranged either by phone or email. At the scheduled time, participants returned to the supermarket to undertake their study shop. On arrival, 'Routine' shop participants were reminded about the broad purpose of the study and the method being used to collect data from them was explained and set up, according to the appropriate protocols (as previously indicated in Appendix 1 and shown in Appendices 7-9). They were then invited to shop, as they had planned, paying for the items they selected (to ensure that the purchases they made were for items they wanted).

Figure 3.4: Allocation of participant by shopping type and data collection method



In addition to the information given to 'Routine' shoppers, 'Routine+FOP' shop participants were shown two examples of existing FOP nutrition panel information used on products in store (shown in Appendix 10) and instructed to 'have a go at using these labels to help you make your food choices'. Figure 3.5 shows the wearable cameras in use in store.

Figure 3.5: Using Autographer and Tobii eye-tracking glasses in store

Image of non-participant used with permission

Data collection following the participants' shop took place in a designated space near the store check-out area, which was screened off from other shoppers (as shown in Figure 3.6). As each participant finished their shop, any chilled items they had purchased were placed into a cool bag, as required, whilst they completed a questionnaire (see Appendix 11 and Appendix 12).

The purpose of the post-shop questionnaire was to collect demographic information which would help to characterise participants and to gather data about their typical food shopping and consumption patterns, nutrition knowledge and use of nutrition labels.

The questionnaire consisted of 28 multiple-item questions with questions either derived and/or adapted from the following sources: questions 4, 5, 16 - National Nutrition and Diet Survey 2008/2009-2010/2011(Department of Health and Food Standards Agency 2014), Questions 6, 7, 8, 10, 11 - Health Survey for England (Boniface S, Bridges S et al. 2012), Question 18 (Roininen K, Lähteenmäki L et al. 1999, Roininen K, Tuorila H et al. 2001), Question 19 (Flynn LR and Goldsmith RE 1999), Question 26-28 (Raats MM, Hieke S et al. 2015). These questions were sourced from completed research on the assumption that existing wording had been acceptable and understandable to previous participants, a form of face validity which Lynn (1986) describes as *"validity conferred by a lay person's*

acceptance that a procedure, statement or instrument appears to be sound and relevant" (Lynn MR 1986).

As review data suggests there is a link between use of nutrition labels and reporting of healthier diets (Campos S, Doxey J et al. 2011) I wanted to collect data to assess whether or not participants reported healthy eating patterns. I used a review of dietary assessment methods, produced by the National Obesity Observatory, as a guide to selecting a tool to assess the diet of participants (National Obesity Observatory 2010). The review provided an overview of different dietary assessment measures and summarised the main characteristics of each tool, including information on its reliability (defined as *"the likelihood that an instrument or tool will measure the same thing each time it is used"*) and validity (defined as *"how accurately the instrument reflects actual behaviour"*) (National Obesity Observatory 2010). Of the five assessment tools listed as suitable for use with an adult population (Five-a-day Community Evaluation Tool (FACET), Dietary Intervention in Primary Care (DINE), Leeds Short Form Food Frequency Questionnaire (Leeds SFFFQ), Cappuccio Two-item questionnaire and the Dietary Quality Score (DQS)) I selected the Leeds Short Form Food Frequency Questionnaire (SFFFQ) for use as it was reported to be a valid tool to measure overall diet quality rather than of specific elements within the diet (for example fruit and vegetables, as with the FACET and Cappuccio Two-item questionnaire), had been designed for use in the general population (whereas the DINE tool was originally designed for use in primary care) and had been designed using a UK population, whereas the DQS was developed for use in Denmark (National Obesity Observatory 2010). The validation data relating to the Leeds SFFFQ was not in the public domain as I made my selection but has subsequently been published (Cleghorn CL, Harrison RA et al. 2016). Cade *et al* (2002) pointed out that there are no recognised 'gold standards' against which to directly test the validity of food frequency questionnaires (Cade J, Thompson R et al. 2002) and Cleghorn *et al* (2016) thus report a study which describes the comparison of the Leeds SFFFQ against another validated food frequency

questionnaire previously used in the UK Women's Cohort Study. The authors report that the SFFFQ showed fair agreement with the other tool and suggest that the Leeds SFFFQ is *"suitable for ranking people according to diet quality"*, which was the purpose for which I intended its use (Cleghorn CL, Harrison RA et al. 2016).

On average, the questionnaire took participants between 10-15 minutes to complete. Whilst the participants were completing their post-shop questionnaire, some of their purchased pre-packed items were selected (according to a standard protocol, shown in Appendix 13) for use as 'product' prompts. Participants then took part in the post-shop interview according to a semi-structured guide (shown in Appendix 14). Interviews lasted between 30-60 minutes. For all participants, the interview started with participants recalling their recent shop and commenting on how similar it was compared to a 'typical' shop in this store. Each participant was then asked to reflect on and to discuss how they make food purchasing decisions. For 'Think aloud' participants, this involved using the 'product' prompts, researcher observations and direct questioning to encourage participants to explore their decision making. 'Wearable camera' participants were asked to view the images of their shop and to comment on their decision-making as they proceeded through the store, with researchers using direct questions and referring to specific images and/or relevant 'product' prompts to encourage discussion (see Appendix 15). The researchers noted any spontaneous mention of the FOP nutrition information panel from participants before introducing a specific discussion around the participant's use of FOP nutrition information panel and/or the barriers they face in the use of this information during their routine food purchasing. All participants were asked to comment about how wider use of this type of labelling might be encouraged. Participants were also asked to comment on the data capture methods they had experienced. Each interview was digitally recorded, with permission. Once data gathering had concluded, participants were given a 'debriefing' sheet (shown in Appendix 16), which declared that the study was primarily interested in the FOP nutrition information panel and which gave participants an

opportunity to leave the study. Each participant reconfirmed their consent to take part at this point. At the end of the interview, participants received a £20 high street voucher, in acknowledgment of the time taken to participate in the study.

Figure 3.6: Data collection space, Store 1

3.6.2 Data collection quality assurance

Following data collection from the first five participants the study protocols and data collection methods were reviewed and minor adjustments were made to refine the processes. Consistent data capture across the research team was supported by peer-training in the use of the wearable cameras, discussion pre- and post- data gathering, and by the use of standard checklists and protocols, as previously shown in the appendices.

3.7 Data analysis

I manually entered the data from the post-shop questionnaire into Microsoft Excel (2010). Once I had checked the data, I created summary tables and descriptive statistics (using the scoring indicated on the questionnaire shown in Appendix 11) to characterise the participants according to the following criteria:

- Age, sex and social demographics
- Educational attainment
- Employment status
- General health status
- Typical food shopping practices
- Attitudes towards and knowledge of healthy eating
- Typical dietary pattern as assessed by the Leeds Short Form Food Frequency Questionnaire (SFFFQ)
- Nutrition knowledge
- Attitudes towards and use of the FOP nutrition information panel

As the method of calculating the Leeds SFFFQ Diet Quality Score was not available in published form when I was analysing this data, I contacted the researchers on several occasions in order to obtain further information about the usual coding scheme applied to this measure. As this was unsuccessful, I created my own scoring scheme (indicated in Appendix 11) which I applied after my scheme had been verified by an experienced nutrition colleague (Key T - Personal Communication 2016)[2]. The data relating to the personal characteristics of participants are presented in Chapter 4.

All of the audio data (from the 'Think aloud' shop and from the post-shop interview with all participants) were transcribed verbatim by an external data processing agency. Once the transcripts were received, I listened to the audio data for each transcript and corrected any errors in the transcription. Each transcript was read and re-read until I was familiar with its contents.

[2] I recalculated participant data with three components of the questionnaire (fruit, vegetables and oily fish) using the scoring system published in Cleghorn CL, Harrison RA, Ransley JK, Wilkinson S, Thomas J and Cade JE (2016). "Can a dietary quality score derived from a short-form FFQ assess dietary quality in UK adult population surveys?" Public Health Nutriton **19**(6): 2915-2923. This resulted in the potential reclassification of one participant to a slightly healthier diet score.

I took a thematic analysis approach, *'for identifying, analysing and reporting patterns (themes) within data'* (Braun V and Clarke V 2006). My approach used some of the research principles and techniques rooted in modified grounded theory (Corbin J and Strauss A 1990, Charmaz K 2006, Bulawa P 2014). This included prior familiarity with relevant literature, adopting an inductive, interpretive approach and a reflexive attitude, using suggested methods for coding and categorising (outlined below) and the use of constant comparison during analysis. Constant comparison involves comparing concepts discovered in the data with other examples to check for similarities and differences, with the aim of improving precision and consistency of analysis (Glaser BG 1965, Corbin J and Strauss A 1990, Hallberg LRM 2006, Bowen GA 2008). NVivo 10 computer-assisted qualitative data analysis software was used to aid the analysis (QSR International Pty Ltd 2012).

I initially coded the transcripts for descriptive and conceptual codes relating to the factors which participants reported influencing their food purchases and which described their attention to the FOP nutrition information panel, with the codes being generated from the data. This involved identifying specific parts of the transcript which reflected an expressed issue or concept, giving this concept a specific description and then assigning this text to the relevant code. As I read the transcript, I also checked the text for any anticipated issues, defined as issues which previous research suggested might be present in the accounts of the participants.

Once all of the individual transcripts had been coded in this way, I looked for ways to group the codes identified in the data into categories. These categories were formed by bringing together related codes and, in some instances, renaming codes and categories which were found to describe similar concepts so that each category or theme identified from the data was distinct. The categories were developed into an overarching coding framework (see Appendix 17). Further analysis was conducted by collating together commonly (and uncommonly) expressed concepts within and between themes to look for

ways to interpret and understand the data (Ziebland S and McPherson A 2006). This analysis took a face value and an interpretive stance, where data was considered within its context (Charmaz K 2006). My supervisors contributed to data analysis by reading a substantial number of participant transcripts, offering suggestions about the codes and themes which I had generated and by corroborating the emphases I placed on the data. I undertook the final analyses, given the importance of the contextual and interpersonal insight which can be brought to interpretation when analyses are conducted by the individual who collected the data (Morse JM 1997).

Once these analyses were completed, I proceeded with a series of analyses relating to the methods chosen for data capture in the study. Initially, I explored the previously coded transcripts to examine the data sources (the 'Think aloud' shop, the 'Think aloud' post-shop interview or the post-shop interview for the participants who wore the wearable cameras) from which key themes had emerged. I then coded the wearable camera images without reference to the other data generated in the post-shop interviews. I manually coded each set of images, with each 'episode' being identified visually (Kelly P, Doherty AR et al. 2012), according to the 'episode' descriptions shown in Appendices 18 and 19. As each image is time-stamped I was able to calculate the amount of time spent on each identified 'episode' and the total time spent on the shop. I coded images from the Autographer initially, as I was more familiar with this type of analysis, followed by coding the Tobii eye-tracking glasses images. I also examined and compared the images from four participants who had gathered data using both types of wearable camera.

Finally, based on the findings from the previous analyses, I revisited the coded transcripts and recoded data to establish which type of prompt had been used by each researcher to generate the information around specific themes. These prompts were defined as a direct question prompt (taken from the semi-structured interview schedule, previously described in Appendix 14), a product prompt (which used a product selected during the shop as a

trigger for discussion) or an image prompt (prompted by viewing images from either type of wearable camera).

To present the data, I selected illustrative quotations to provide examples of specific concepts and themes which had been extracted from the data. I chose these quotations by reading all of the relevant text which had been coded under a specific theme and selecting text which described the key concept, taking care to ensure that data from the participants was fairly represented. Direct quotations used in this thesis are presented in quotation marks. For each quotation, participant text is presented in italics while researcher text in shown in normal font, with square brackets denoting a change in text source. Each illustrative quote also shows the anonymised participant number, identifies the gender and age of the participant, shows in which store the data was captured, provides information on participants' self-declared label use (where relevant) and indicates the source from which the data was generated.

3.8 Summary

This chapter has described the methods used to address the research questions posed in this thesis. The following chapter describes some of the characteristics of the participants who took part in the study while subsequent chapters present the findings of the various analyses.

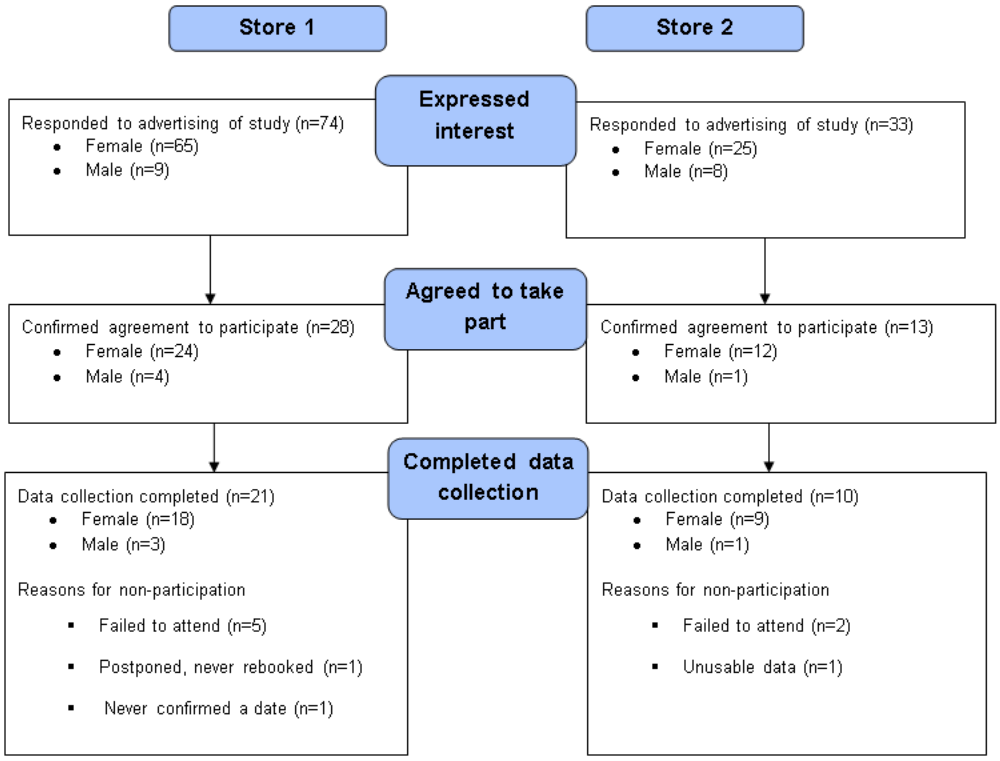
4. PARTICIPANTS

4.1 Participant characteristics

This chapter presents data describing the participants who took part in the study. After presenting information about recruitment into the study, I proceed to show the data collected through the questionnaire (given previously in Appendix 11) which participants completed after they had completed their shop but prior to taking part in the post-shop interview. All of the data in Figures 4.2-4.15 shows data for both stores and all participants.

Figure 4.1 shows the recruitment of participants across the stores involved in the study. In total, 107 people responded to the advertising of the study and sought further information. Data collection was completed for a total of 31 participants, most of whom were female. All but one participant described their ethnic group as White/White British, with one participant identifying as Asian/Asian British Chinese.

Figure 4.1: Participants' recruitment into study stores



Figures 4.2-4.4 show the age, educational achievement and employment status of participants at the time of data collection. The data show that participants were of mixed age, well-educated and employed. Figure 4.5 presents data of the self-declared health status of participants and suggests that the majority of participants felt they were in good or very good health.

Figure 4.2: Age of participants

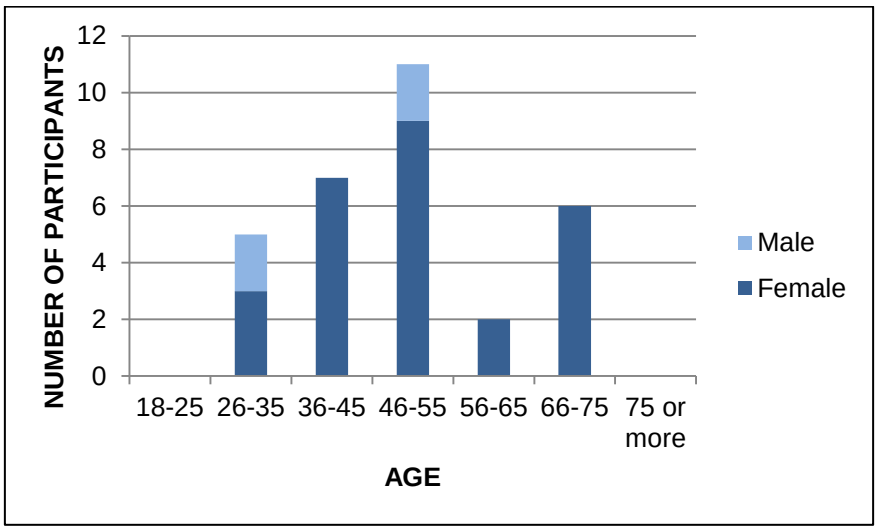


Figure 4.3: Highest educational achievement for participants

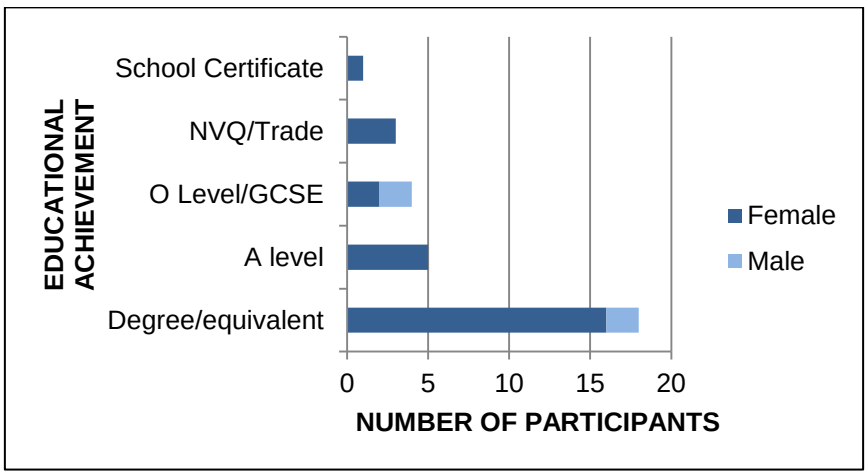


Figure 4.4: Employment status of participants at time of data collection

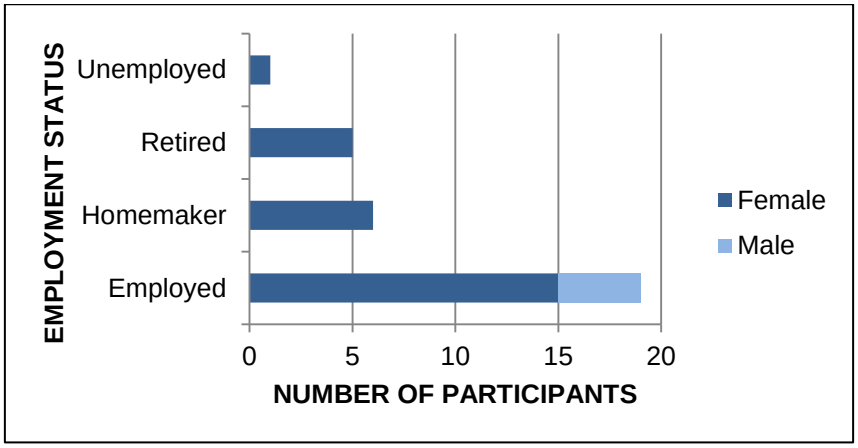


Figure 4.5: Self-reported health status at time of data collection

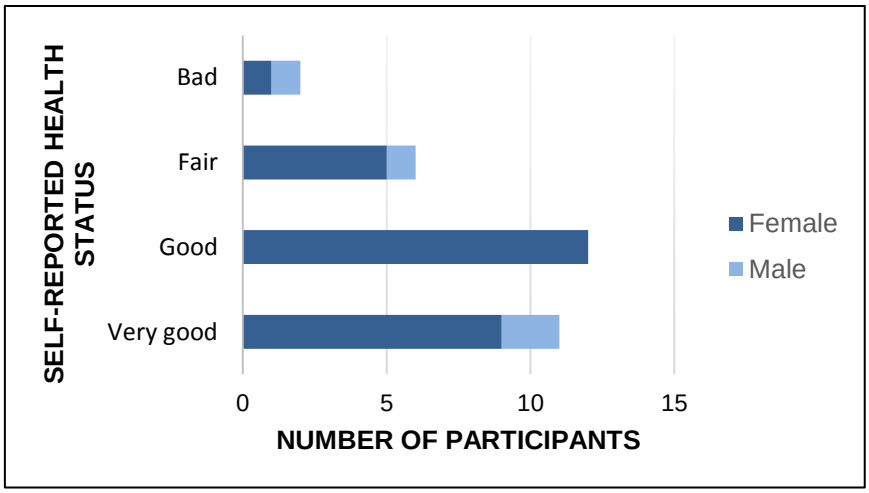
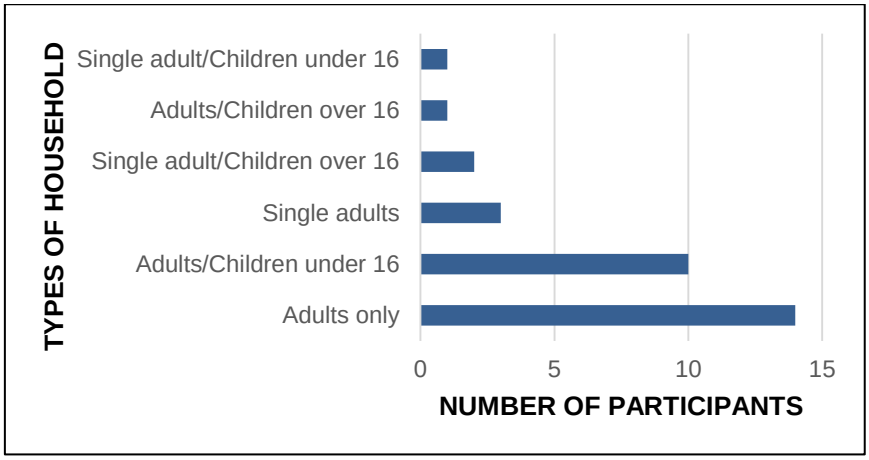


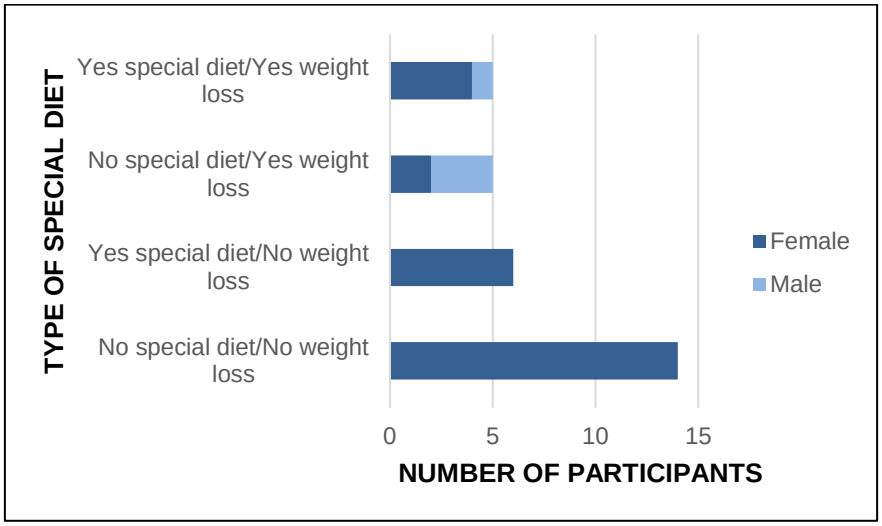
Figure 4.6-4.8 provide information about the participants' household and typical shopping patterns. All of the female participants described themselves as the main food shopper within the household whereas all of the male participants identified their female partners as the main person who shopped for food in their household. Figure 4.6 shows that the majority of participants co-habited with another adult and/or with children under 16.

Figure 4.6: Household description



As shown in Figure 4.7, most participants reported that a special diet or for a diet for weight loss were not being followed either by themselves or someone else within their household. Of those participants who did describe the need to cater for a special diet in the household, typically these involved avoidance of specific dietary components like gluten, nuts or milk/eggs. One participant followed a sugar-free diet to help control her diabetes.

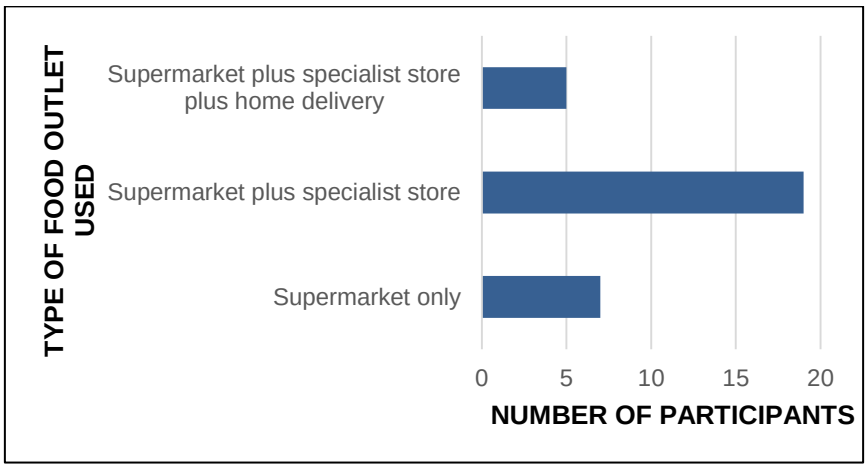
Figure 4.7: Type of special diet followed within household



Most participants reported sourcing their food from a variety of store types (see Figure 4.8). Specialist stores used included a greengrocer, butcher, bakery, a market, a

delicatessen and a farm shop. The majority of participants described undertaking a main weekly shop and top-up shops for smaller amounts of food at least once during the week. Some participants reported doing top-up shops on most days.

Figure 4.8: Type of food outlet usually used by participants



Figures 4.9 provides information about the participants' attitudes towards healthy eating, based on their answers to the statements in question 18, with a higher score indicating a more positive attitude towards healthier eating.

Figure 4.9: Participants' attitude towards healthier eating

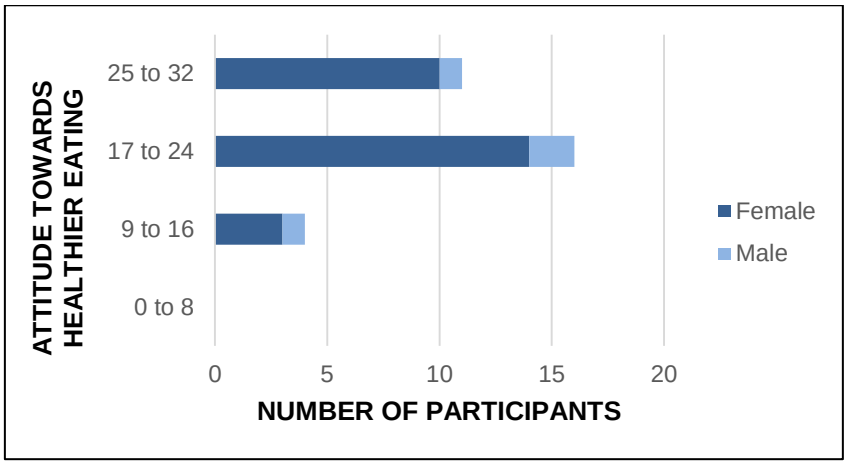
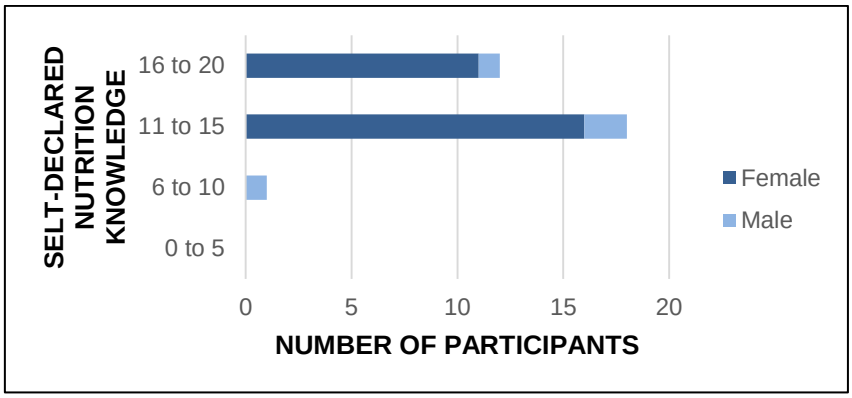


Figure 4.10 shows how knowledgeable each participant reported themselves to be about healthy eating, based on their answers to the statements in question 19 in the

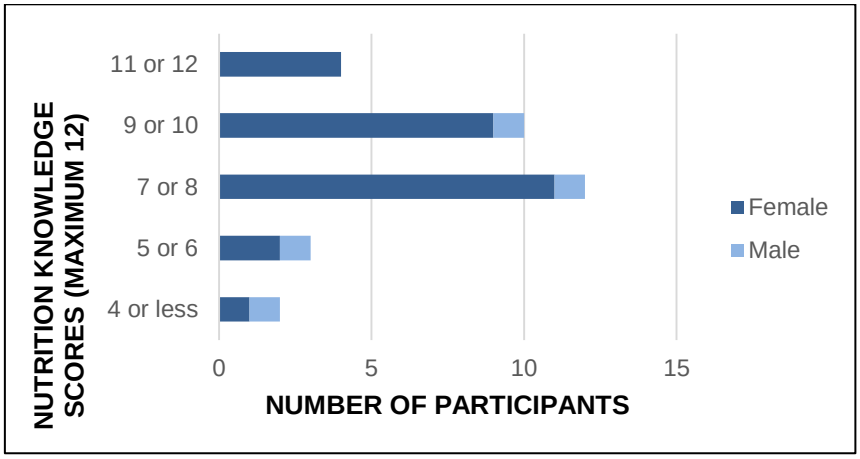
questionnaire, with a higher score indicating a higher rating of their own nutrition knowledge.

Figure 4.10: Participants' self-declared nutrition knowledge



Their actual nutrition knowledge, as tested by the correctness of answer they gave to questions 24-25 in the questionnaire, is shown in Figure 4.11.

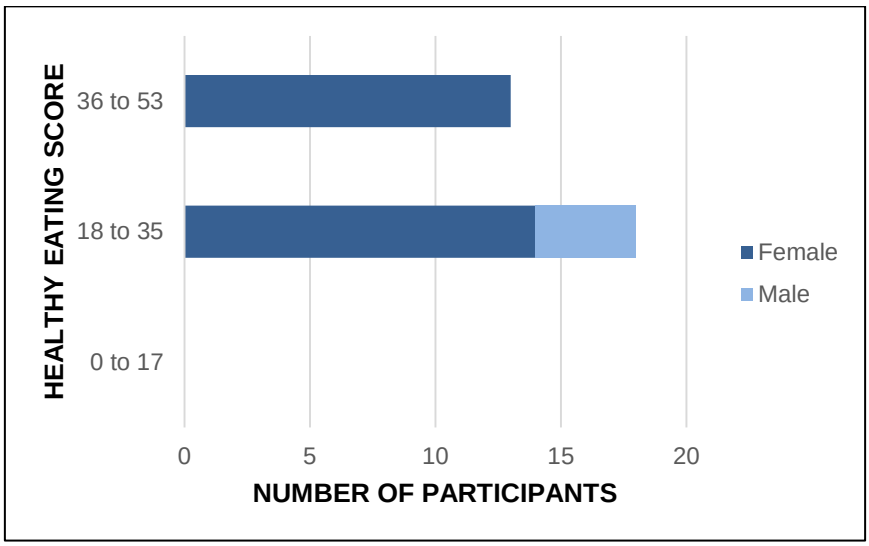
Figure 4.11: Participants' nutrition knowledge scores



The data suggest that although participants were positive in their attitudes towards healthy eating and rated themselves as knowledgeable about nutrition, when tested they appeared to be slightly less knowledgeable about specific aspects of nutrition.

Figure 4.12 shows the participants' Health Eating Score, based on their self-reported typical dietary pattern, as assessed by their responses to the Leeds SFFFQ (questions 20-23 on the questionnaire). A higher score indicates a healthier self-reported diet, with the data suggesting that participants reported a moderate to healthy typical dietary pattern.

Figure 4.12: Participants' Healthy Eating Score reflecting their self-reported typical dietary pattern, as assessed by the Leeds SFFFQ



Figures 4.13-4.15 provide information about participants' declared use of, and attitudes towards the FOP nutrition information panel, based on their responses to questions 26-28 in the questionnaire. The data show that most of the participants reported using the FOP nutrition information panel at least occasionally or often, most rated the level of information provided on the panel as 'enough' and most also rated the information provided to be 'quite' or 'very easy' to understand.

Figure 4.13: Participants' declared frequency of use of FOP nutrition information panel

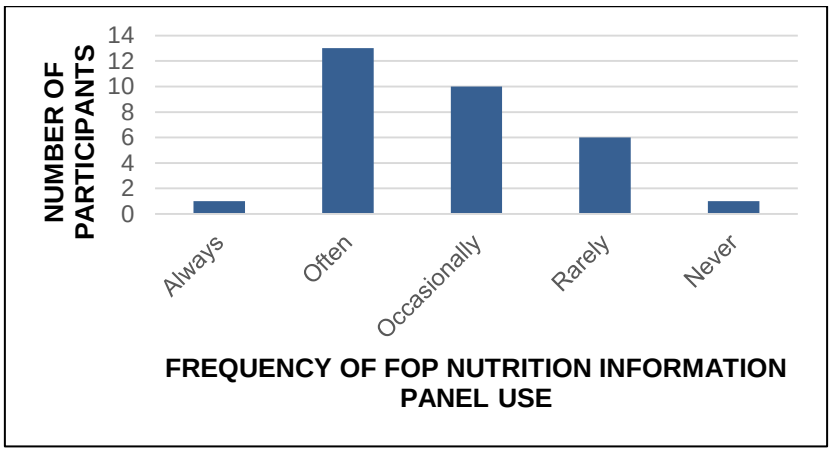


Figure 4.14: Participants' rating of the level of information provided on FOP nutrition information panel

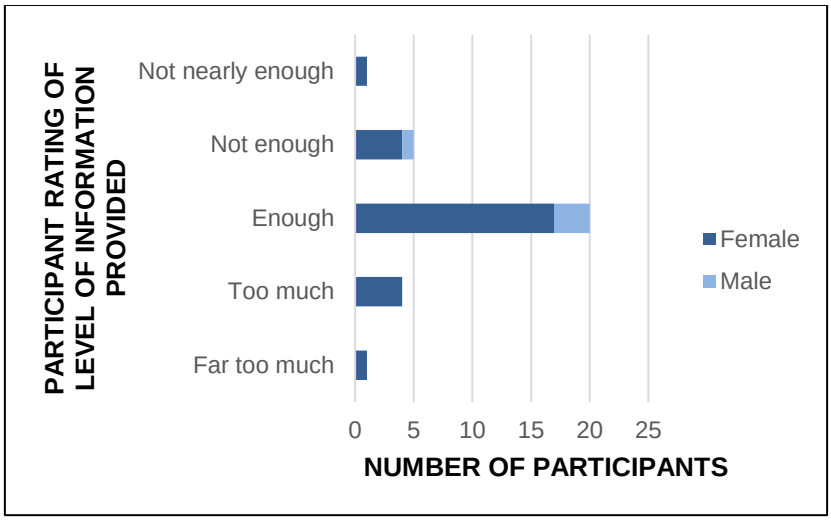
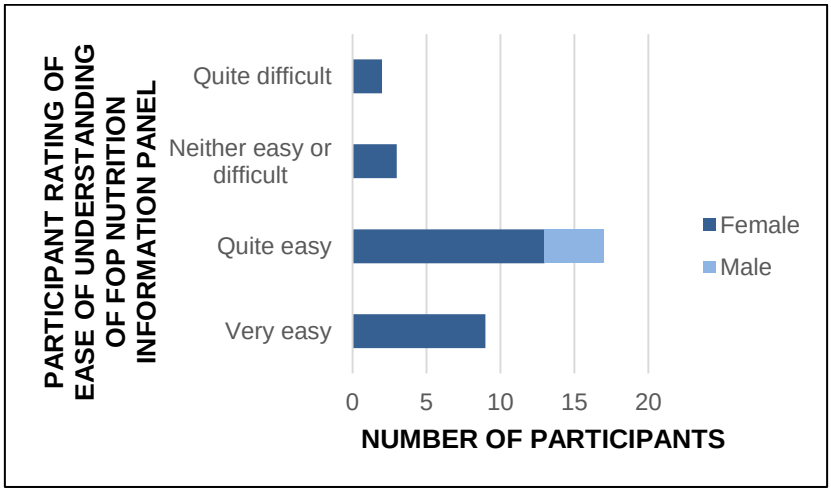


Figure 4.15: Participants' rating of ease of understanding of FOP nutrition information panel



4.2 Summary

This chapter has described some of the characteristics of the participants who took part in the study. Participants' were predominantly female, white British, of mixed age group, well-educated and employed. Most participants declared themselves to be in good or very good health. The majority of participants lived in family groups with another adult and/or a child or children under 16 years old. All of the female participants declared themselves to be the main food shopper for the household, most participants used a variety of store types from which to source food and most typically undertook weekly and 'top up' types of shopping trip. Participants held broadly positive attitudes towards healthy eating and reported a moderate to healthy typical dietary pattern. Although specific aspects of their knowledge appeared limited, most rated their nutrition knowledge to be good or very good. Prior to knowing that this study was specifically focused on the FOP nutrition information panel, most participants' reported using this information at least occasionally or often. The following chapters present the findings of the research.

5. FINDINGS: INFLUENCES ON PURCHASING DURING ROUTINE SUPERMARKET SHOPPING

5.1 Overview

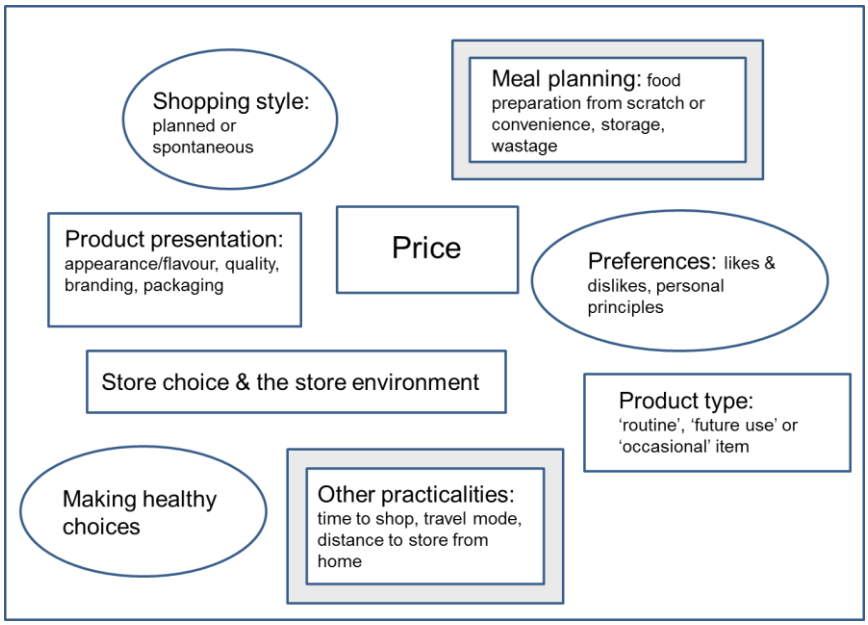
This chapter seeks to contribute to addressing the thesis research question:

> What contextual factors influence decisions made at the point of choice during routine supermarket shopping?

I present findings from the analysis of data provided by the study participants relating to the factors which influence the decisions they make when selecting products for purchase. The data sources used for this analysis were the audio and transcribed 'shopping' data from the twelve participants who took part in the 'Think aloud' process and the audio and transcribed interview data from all of the thirty one participants following their shop.

A summary of the key themes which emerged from the data is shown in Figure 5.1. To aid description, the key themes have been divided into three separate categories (product-related, person-related and practicality-related themes).

Figure 5.1: Influences on purchasing decisions during routine supermarket shopping: a summary of key themes



Note: Rectangle = Product-related themes, Circle = People-related themes, Framed rectangle = Practicality-related themes

5.2 Product-related themes

Themes discussed in this section include price, product type, product presentation, store choice and the store environment.

5.2.1 Price

Price influenced every participant in this sample, with all of the participants seeking out offers during their shop. Some were on a restricted income but even those with more to spend were keen to choose products perceived as value for money or which offered 'more for less'. Most participants said they were prompted to purchase a product because of its price and only a minority of participants reported either resisting an offer or weighing up and justifying the purchase of a more expensive product.

Frequently, participants were seen seeking out the areas in the store where offers are typically placed and most participants reported their interest in taking advantage of the

price reduction deals offered by the store. Commonly, participants said they were attracted by cheaper prices, 'three for two' or 'buy one get one free' offers on the products they selected.

> *"I was having a look to see if there had been anything reduced. Often they are in one place, sometimes they're kind of dotted all over the place, so I was just looking to see if anything had been reduced there"*
>
> Participant 017, female, Store 1, aged 26-35 years, Autographer post-shop interview
>
> *"Obviously I can see that it's money off as well, and that seems you know quite a bit cheaper than the other, the other pasta sauces round about, so yeah I think I'll go for that one"*
>
> Participant 011, male, Store 1, aged 26-35 years, 'Think aloud' shop
>
> *"So this is Kellogg's variety pack, which is special offer, two for three quid… So I think I'll buy two of these, because they're on special offer. I wouldn't normally buy two, to be honest, but because they're special offer I will buy them"*
>
> Participant 022, female, Store 1, aged 46-55 years, 'Think aloud' shop

Some participants appeared particularly 'price-aware' and planned their shopping trip around advertised offers. A few spoke of deliberately monitoring prices and waiting for price reductions before buying products in store. Others decided not to make a purchase but to shop elsewhere, where they knew that prices for similar items would be cheaper.

> *"Well I can remember prices quite well, from other places, so I know, although its half price, other people's half price would be lower"*
>
> Participant 007, female, Store 1, aged 36-45 years, Autographer post-shop interview

A few participants talked openly about the need to consider the price of food purchases because of a recent change in personal circumstances (in one instance a period of adoption leave and, in another, the job loss of a partner) while others reported a longer term requirement to balance their finances.

> *"I'm very good at making something out of nothing, and I've got to make my money last. You know on my wages, being a full time carer, every penny counts. So yeah, I have to be very, very careful"*
>
> Participant 015, female, Store 1, aged 36-55 years, 'Think aloud' post-shop interview

> *"Neither my husband, nor I earn very much and we are in some debt so we're trying to not spend, like not not think about it"*
>
> Participant 028, female, Store 2, aged 26-35 years, Autographer post-shop interview

Most participants said that they were prompted to buy at least one product because of an offer. This often involved getting a product they would usually buy at a lower price than normal, which several participants viewed as a 'lucky' purchase. For some, it involved a change away from a usually selected brand to benefit from an offer on a different brand or a shift in purchase from a branded to an 'own' branded product (which was a cheaper price) or to a product from a 'value' range.

> "*Three fillets, Scottish salmon. Was seven pounds, it's now three pound fifty. Well I wouldn't normally buy these but at this price I will, because three is a lot for me to eat, but I will get that…I like salmon, and I do buy it fairly regularly. I probably wouldn't have bought it today but I bought it on price, because you know it was a bargain price, and I fancied it"*
>
> Participant 009, female, Store 1, aged 66-75 years, 'Think aloud' shop
>
> *"This was purely the price comparison between their own brand and Bird's Eye…I don't think there's any difference between them to be quite honest. I think you just pay for the brand… I think one frozen pea generally tastes much like another one…If the Bird's Eye ones had been reduced to less than the [name of participating supermarket] ones then I might have bought the Bird's Eye ones"*
>
> Participant 027, female, Store 2, aged 46-55 years, Tobii post-shop interview

Some participants reported selecting a 'premium' range product or a product which they perceived to be of better quality when it was on offer as they considered this to be at a more affordable price than normal. Others capitalised on an offer to stock up on frequently used items, often justifying the purchase as a product with a variety of uses or which could be stored for later use. Participants frequently checked the 'use by' date on these products, suggesting that their selection involved a considered, rather than impulsive, approach. One participant was aware that she was prompted into purchasing an item she didn't need, because it was marked down in price.

"Some biscuits? I think we've used up… Oh no, you see that's why, I get the children's snacks there because they're on half price at the moment so they will do there. I only buy them when they're on offer"

Participant 021, female, Store 1, aged 66-75 years, 'Think aloud' shop

"And I've got my bargain cheese for two pounds, thinking oh… that's the one that I don't really need but I'm buying it anyway"

Participant 004, female, Store 1, aged 36-45 years, Autographer post-shop interview

Although each participant reported that they were looking out for offers, a minority resisted at least one offer during their shop. One participant chose not to purchase a 'three for two' offer because she recognised the extra amount would go to waste. Another participant weighed up the price of a reduced product against items already available at home and decided against the purchase. Another participant was unsure of the amount of storage space available in her freezer and so decided to resist the offer until she had checked at home.

Although each participant frequently considered the price of products as they shopped, factors other than price occasionally appeared to outweigh the influence of price. These factors included paying extra for quality, for locally sourced products, for organic items and because of loyalty to the study supermarket chain. For a few participants, choosing products as a treat reduced the importance of price. One participant prioritised the pressing need to provide a meal for her family on the day of her shop while another considered the price of a product to be too expensive but decided to purchase it anyway because it was required.

"I like their pies, they have a Higgledy, I think they call it. £3.60 for a small pie, it's a one portion pie. They're good. I'll have one of them sometimes once a week… they're nice to taste. I don't mind paying a wee bit extra, if I like it"

Participant 031, female, Store 2, aged 66-75 years, Autographer post-shop interview

"Well, I saw the broccoli and it kind of made me realise that I had nothing for dinner… so, and I know we all eat it, and so I thought well I'll get some while I'm in here anyway. And it was quite nice quality. I don't even know how much it was, to be honest, well I didn't look at that"

Participant 019, female, Store 1, aged 46-55 years, Autographer post-shop interview

5.2.2 Product type

Most participants selected a product which they described as a 'routine' purchase. Typically, participants considered these to be 'essential' or staple foods which they knew they needed to pick up (whether or not they used a list as an aide memoire). Often, these were regularly used items which had run out, or were needed for a specific recipe or meal planned for the day of the shop. In a few instances, participants considered the selection of a routinely used product but decided to delay its purchase until a later date.

> *"Things like Cheddar I buy just to keep in the fridge because you use them for all sorts of things. Ricotta, I have got a specific thing in mind to cook with, so that's why I wanted the ricotta"*
>
> Participant 027, female, Store 2, aged 46-55 years, Tobii post-shop interview
>
> *"Oh, I was looking at those vegetable fingers, because I think we finished them off the other day. Yeah. And then I guess I decided the freezer was totally full so I didn't get them in the end"*
>
> Participant 012, male, Store 1, aged 26-35 years, Autographer post-shop interview

Most participants also selected products which they planned to use in the future rather than for immediate use. These 'future use' purchases tended to be selected so that they could be used with other items the participant already had at home to make a specific meal or because they were different from products which the participant already had or which could be used to fit in with planned family activities. Commonly, participants considered the use-by dates or the shelf-life, the suitability for freezing and issues around waste before deciding to purchase these products.

> *"Lamb is my favourite and it's so expensive so I only buy it when it's on the offer. And I thought those two little chops, I could eat two easily actually, and I've got two that I bought last time they were on the offer and put them straight into the freezer, which I'm going to do with these. I might have them for Sunday dinner, for a Sunday roast"*
>
> Participant 015, female, Store 1, aged 46-55 years, 'Think aloud' post-shop interview
>
> *"Now I'm looking at biscuits. I'm just looking for some biscuits to keep in the cupboard for if anybody drops in for a… I don't really eat many biscuits because of the diabetes, but I like to keep some nice ones in the cupboard... [name of*

participating supermarket's premium range] type ones, which are very nice. So I like to keep a box of those in the cupboard in case anyone pops in for a coffee"

Participant 030, female, Store 2, aged 66-75 years, Autographer post-shop interview

"Well I mean I think, as a family obviously we understand that costs are going up you see, so we're trying to be a bit more savvy and not just buy stuff and think oh that'll be fine, and then it's gone out of date because we didn't plan it, chuck it in the bin, which is obviously what a lot of people do, and what we were doing a long time ago. But we just don't have the money to do that now"

Participant 017, female, Store 1, aged 26-35 years, Autographer post-shop interview

Sometimes, participants also appeared to select products as treats. Although, a few participants reported planning in advance to purchase a treat for a special occasion, most of these 'occasional' foods were products which caught the eye of the participant, either because they (or a family member) particularly enjoyed it and/or because it offered a change from the routine.

"A bit dear but it's my little treat…Oh, I can't wait for those mussels! I'll have them when I get home, for my breakfast, and a banana…A little treat for me, I don't treat myself very often… It is a bit expensive but I mean that's my week's treat"

Participant 015, female, Store 1, aged 46-55 years, 'Think aloud' shop

5.2.3 Product presentation

The majority of participants reported being aware that the way products were presented and the range of products from which they could make their selection did impact on their decisions to purchase. Most commonly, participants described considering issues related to appearance and flavour, perceived quality, branding, novelty and packaging.

The appearance and flavour of a product was reported as high on the list of priorities for most participants. Participants said they chose products based on the look of them, in some cases taking appearance as a proxy for freshness. The look of the photograph on the package of a pre-prepared product was also often considered, although a few participants were cautious in case the product inside the packet did not live up to the

expectations raised by the photograph. Damaged packets were often discarded, even when the price was reduced.

> *"I did have a look at the hot-cross buns actually, and I looked at them, and because you can see them they look more attractive, because they're in cellophane"*
>
> Participant 016, female, Store 1, aged 36-45 years, Autographer post-shop interview
>
> *"I didn't buy my normal bread because on the top shelf there was a 75p loaf that looked really nice, it looked very tasty, so I bought that one…even though I did buy that because of the price, I wouldn't have just bought it if I didn't like the look of it, just because it's cheap. I also really like the look of the bread"*
>
> Participant 019, female, Store 1, aged 46-55 years, Autographer post-shop interview
>
> *"Oh there, it's there. Is it that one? On no, it doesn't look presentable"*
>
> Participant 005, female, Store 1, aged 36-45 years, 'Think aloud' shop

Most participants reported selecting a product either because they already knew they liked the flavour, because they preferred the taste of one item over another or because a product which they hadn't tried before 'looked' tasty. A few participants also considered and then decided against a purchase of an item because they knew that they (or their family) didn't like its taste.

For some participants, the quality of an item was important in their decision making. Commonly, these participants reported that some product categories (such as meat products) were always selected on the basis of perceived quality, with quality relating to issues of improved animal welfare, local sourcing, organic growing methods and/or superior production methods. Implicit within this quality assessment is the consumer expectation that the supermarket upholds reasonable welfare and trading practices, a trustworthiness which a few participants questioned but (on balance) chose to believe. For other product categories, decisions around quality related more to the type of occasion being catered for - higher quality products were selected sometimes for a celebration or as a treat and, sometimes, the decision involved trading off about whether or not a higher or lower quality product would be acceptable.

> *"I mean all the supermarket brands have their… luxury labels…and again that is a consideration occasionally when we're wanting to buy something that we wouldn't normally buy, we will go for those higher end branded products…the primary message is, this is a high end and luxury item you're buying, which is why you're paying another four hundred and fifty-two pounds for it, but the implication is that the ingredients they're using are much more high quality, and my brain, probably wrongly, will trust that… it'll be finer quality ingredients that are going into it"*
>
> Participant 023, male, Store 2, aged 46-55 years, Tobii post-shop interview

> *"Seeing all those bottles reminded me that we need to have a celebration tonight because my daughter's just finished her GCSEs, so I was looking for something, yeah, reasonable priced and sparkling, because she wouldn't know a champagne from Cava so I can get away with it a Cava instead"*
>
> Participant 020, female, Store 2, aged 46-55 years, Tobii post-shop interview

Similarly, brand loyalty was reported to be important for some participants with some product categories but not for others. This decision was influenced by issues around perceived quality, flavour and taste, the way in which the item was going to be used and price. Celebrity endorsement of a product also impacted on product selection on a few occasions.

> *"I'm trying this. I do have the Bran Flakes but I would normally have the Kellogg's and I thought for instance I would try the cheaper brand… just to compare, yeah, on price and just to see if I can see a difference…yes, I'm going to try them, probably, on the expectations that they're not going to be as good but… without trying them I won't know"*
>
> Participant 010, female, Store 1, aged 46-55 years, Autographer post-shop interview

Some participants were interested in novel products which offered the opportunity to select items different to normal. For a few participants, new products were selected as an experiment to see if they would be liked, either by the participant or their family. This experimentation was facilitated by price reductions on novel items. Other new products were chosen because they 'sounded nice' or looked good.

> *"I think usually I'd buy the stuff that I sort of like, but I'll have a look to see if there are kind of new things about"*
>
> Participant 025, female, Store 2, aged 56-65 years, 'Think aloud' shop

> *"I don't know this particular variety particularly well, use meatballs that often, but I just thought it would be different from spaghetti bolognaise, quite a similar sort of meal…these have herbs and spices in them. I presume they will be nice. We've had a similar sort of thing before and it makes a change when we have them. This is one of the problems with dinners, after years and years you're trying to look for some variety but to keep it fairly simple"*
>
> Participant 021, female, Store 1, aged 66-75 years, 'Think aloud' post-shop interview

A few participants mentioned the impact of the style of packaging on their product selection. For one participant, the photograph of a pre-packaged product looked similar to something she would have made at home, which encouraged her to decide to buy the item. Another participant was irritated to find that the 'normal' packaging on a product had been updated, which meant she had to spend longer trying to find her 'usual' version.

> *"If the packaging was really sort of dull looking or something, and that… you know I know a lot of this is really cheap brands, or even within a brand you can get like smart price sort of things and stuff like that, I know generally they cut down on the packaging, which is good in one respect because obviously you're not wasting your money on all the packaging, but on the other hand to some extent I think packaging does draw the eye, so as to you know whether you might buy one or the other"*
>
> Participant 018, female, Store 1, aged 46-55 years, Tobii post-shop interview
>
> *"The packaging, it makes it look really, really nice. It's a lovely photograph, yeah…because if something looks attractive you automatically think it's gonna taste nice"*
>
> Participant 031, female, Store 2, aged 66-75 years, Autographer post-shop interview

5.2.4 Store choice and the store environment

The choice of store and the store environment also contributed to selection decisions for some participants. Although most participants shopped at different supermarkets, several considered themselves to be loyal to the participating supermarket and to the store where the study was taking place. For some, this was related to the convenient location of the store but others mentioned the friendliness of the staff, the product selection and the trustworthiness of the specific supermarket.

Being familiar with the store layout helped participants' to make their selection. Some participants were happy to retrace their steps to find items they had forgotten whereas others were displeased when the store moved items from their 'usual' place. Several participants were aware that the supermarket moved products around the store in order to encourage browsing and to prompt impulse purchases. This was viewed with annoyance by participants who perceived this need to seek out products as adding to the burden of their shopping trip. A few participants were prepared to ask store staff for help in locating items but others chose to undertake, on occasion, a lengthy unaccompanied search for the item they needed.

> *"I'm thinking oh they haven't got any cooking apples, I'm not looking in the right place here, then I found them over on the other side"*
>
> Participant 006, female, Store 1, aged 46-55 years, Autographer post-shop interview

> *"I want sandwich spread…I can't always remember where it is, which is terribly inefficient but somewhere around. It's usually with the meat pastes and things…now I can't see sandwich spread, which is extremely irritating. Okay. Let's go back around here. It's normally round… perhaps it isn't…now, then I've pretty much come to the end of my list but I'm going to retrace my steps because I haven't got the eggs and I'm going to try and find some sandwich spread which if it's not here I can't… and that'll be by the marmalades, I've just had an epiphany, it might be by the marmalade, which are round here aren't they, at the end of this… these are the jams here aren't they. Have I got that right? No that's the meat, the jam is in the next one, which is where I hope the sandwich spread will be. If it's not, I might have to give up on that one today. Ha ha, bingo"*
>
> Participant 024, female, Store 2, aged 66-75 years, 'Think aloud' shop

5.3 Person-related themes

Themes discussed in this section are shopping style, preferences and making healthy choices.

5.3.1 Shopping style

At first, there seemed to be two distinct types of shopping style into which participants could be divided: 'planned' or 'spontaneous'. Participants who fitted into the 'planned' shopping style commonly came to the store with a prepared list of items to be purchased.

Planners reported using a variety of mechanisms to create their list including writing items which needed to be replaced on post-it notes, in a diary or on the family notice board, checking store cupboard items, planning menus and noting special offers advertised locally.

> *"It's stuck on the wall in the kitchen, and when things run out or nearly run out I put them on it. And then we also have a list of the main meals for the week, so the evening meals and I write, so I have my list and then I write the menus for the week, and I add to the list the other things I'm going to buy."*
>
> Participant 028, female, Store 2, aged 26-35 years, Autographer post-shop interview

A few participants differentiated between the type of shopping they were doing before deciding whether or not to use a list, using a list for larger 'trolley' sized shops rather than for smaller 'basket' sized shops.

> *"Sometimes if I know that I'm doing my main shop I will do a list, but not normally for this shop because it is normally just offers and little extra bits"*
>
> Participant 026, female, Store 2, aged 26-35 years, Tobii post-shop interview

Participants adopting a 'spontaneous' shopping style tended to be less prepared in advance of arrival in store. Typically, they adopted a browsing, flexible approach and purchases were often prompted by looking. Products with a price reduction or which offered participants variety or novelty from the norm, or treats, were frequently selected by participants during these types of shopping trips.

> *"No I never have a list. In my head I know what I like and what I want, and whether I'll use it or not and the prices on the pack, or if there is anything on offer."*
>
> Participant 031, female, Store 2, aged 66-75 years, Autographer post-shop interview
>
> *"Oh hang on, I'll just get some crisps. I don't want a huge number but I do like a little munch in the evenings, so let's just get something that's nice to munch"*
>
> Participant 024, female, Store 2, aged 66-75, 'Think aloud' shop

On further examination, I revised my rigid categorisation as participants frequently adopted both approaches during their shop. All but one participant who mentioned using a

shopping list bought items which weren't included on the list on at least one occasion, suggesting that some purchases were made using a more 'spontaneous' shopping style. The reasons given for shopping 'off list' varied - making the most of price reductions, forgetting to look at the list, needing to substitute a different item when the planned purchase was not available, buying products to store for future use or seeing a product that looked appealing.

> *"I'll have a list and I will literally try and keep to it and my husband, if he's with me, he'll be mouthing to me 'Keep to the four things on the list'. I tend to sort of go 'Oh, well that's a bit of a bargain, let's have that' so that you know… and then he's kind of going 'Four things four things!' and I'm like 'OK, whatever'"*
>
> Participant 004, female, Store 1, aged 36-45 years, Autographer post-shop interview
>
> *"Yeah, I think I was just looking around to see if there was anything and I then, again not on the list, but I bought some houmous"*
>
> Participant 023, male, Store 2, aged 46-55 years, Tobii post-shop interview
>
> *"Weetabix is something, yeah we routinely buy. [Daughter] likes Weetabix, and I know we're down so we haven't got many Weetabix left, so that was sort of one that I'd focused on picking up. But then if there is something else that took my fancy I might pick it up now"*
>
> Participant 001, female, Store 1, aged 36-45 years, 'Think aloud' post-shop interview

Independent of the use of a shopping list, a common activity for most participants was to weigh up options before selecting an item for purchase, suggesting that even 'spontaneous' shoppers considered and planned some of their decisions.

5.3.2 Preferences

Shopping behaviour appeared to be shaped by the need to balance the personal preferences of family members, friends and visitors alongside the participants' own personal likes and dislikes when they were selecting items. Commonly, a product was selected or discounted based on whether it would be liked by the whole family. Participants also frequently described having to consider the varied likes and dislikes of family members before choosing a product. One participant opted to try a new product to see whether or not it would be liked by the family but another expressed reservations

about trying new flavours because of the risk that they might not be eaten. A participant who lived alone faced another issue, voicing her concern about the challenge of portion size and wastage.

> *"It's my husband's flavour, not mine, and he really likes that one. So I humour him and bought it for him. I just eat natural"*
>
> Participant 016, female, Store 1, aged 36-45 years, Autographer post-shop interview

> *"I like munching on an apple quite a lot. And those ones are the most expensive I know, a lot of them but I do like them, they're quite sweet. I like them, they need to be crunchy, I don't like them sort of soft"*
>
> Participant 018, female, Store 1, aged 46-55 years, Tobii post-shop interview

> *"I like buying salmon but my husband's not keen on salmon so I don't buy it a lot. There was some salmon reduced but I thought no that's just being extravagant, and it would be just for me. My husband's not interested in salmon. My daughter, when she's around, doesn't eat a lot of fish, she prefers the breaded fish rather than fresh fish so I looked at the chilli salmon, but put it back down because it would be just for me and not doing for the whole family"*
>
> Participant 002, female, Store 1, aged 46-55 years, Autographer post-shop interview

> *"I live alone so you know it's always too much anyhow. On the odd occasion I buy pizza, I end up throwing it, most of it away"*
>
> Participant 009, female, Store 1, aged 66-75 years, 'Think aloud' shop

Vegetarian participants (or who had to cater for vegetarians) reported regularly examining product packaging to see whether or not an item was suitable for vegetarians. These participants also mentioned the additional challenge imposed on product selection by having to consider the different needs of family members with vegetarian, non-vegetarian and vegan dietary preferences.

> *"Where the label has for vegetarians or not, it's very important for our family because my husband is vegetarian"*
>
> Participant 005, female, Store 1, aged 36-45 years, 'Think aloud' post-shop interview

> *"My daughter in particular is very capricious, so I'm very reluctant to buy something that she says she really loves unless it's either quite cheap and I can frankly ditch it if nobody eats it, or it's something that I will eat as well, or somebody else in the family will eat. So something like the Quorn bacon style slices, because I'm vegetarian-ish I know that's not a waste of money…I will eat it as well"*
>
> Participant 022, female, Store 1, aged 46-55 years, 'Think aloud' post-shop interview

Personal and family principles influenced the decisions made by some participants too. Several participants were keen to bring their awareness of ethical and environmentally friendly production methods into their food shopping and reported actively seeking out Fair Trade and/or organically produced products, despite often having to pay a price premium for these items. For others, seeking out products produced using high standards of animal welfare was said to be important.

> *"I'm going for the organic. And I've got, I've made a choice to buy the Fair Trade chocolate, just because I feel really crap about the fact that these people are earning a minimal amount of money… it was actually watching a film which really impacted on me about Fair Trade, and that was what really upset me, and I just thought you know I can change a couple of things, by pence really, per week and I can do that, it's simple. It's not a major thing, but I can do that and that was really important to me"*
>
> Participant 004, female, Store 1, aged 36-45 years, Autographer post-shop interview
>
> *"All the years I was shopping, I'm not quite so strict now, now that my children are grown up, but when the children were small it was vital, I thought, to buy organic. And it was more expensive. And people would say to me "I can't afford it", and I would think well but you're going on expensive holidays, and we're just camping and it's about priorities"*
>
> Participant 008, female, Store 1, aged 66-75 years, 'Think aloud' post-shop interview
>
> *"And I always think that possibly if you buy organic milk then it's not full of, all sorts of, you know, nasty stuff really, antibiotics they give to cows and you know all sorts of kind of growth hormones and… I mean I do think about that so, and I don't know whether it is free of those but one hopes it is free of the worst things that you hear are put into our, you know our stuff that we consume"*
>
> Participant 025, female, Store 2, aged 56-65 years, 'Think aloud' post-shop interview

The country of origin of a product also appeared of interest to several participants. A few actively avoided buying products sourced from overseas whereas others considered local sourcing or products produced in Britain as part of their overall purchasing decision. For some, the labelling of some products as British appeared to signal higher welfare standards than for products produced elsewhere.

> *"One thing that is a consideration, and again this applies to both of us, if something is obviously come from, has got a lot of carbon footprint, I'm quite good at saying, um I'm not going to buy stuff from South America, I'm not going to buy*

stuff… And certainly the British logo, the Union Jack logo, that is a consideration. Not always but it does come into play"

Participant 023, male, Store 2, aged 46-55 years, Tobii post-shop interview

"I do always look on the fruit, which country of origin actually normally, and I didn't look on this. And I can't see it… Oh maybe it's underneath here… Namibia, well, there you go. I wouldn't not buy it because it came from that country, but I'm quite interested to know which country it came from"

Participant 009, female, Store 1, aged 66-75 years, 'Think aloud' shop

"I like to buy British if I can…I can't see where they've come from…I mean I'm not obsessed with buying British but I do like… [They're from Spain] *Ah, okay, thank you. In which case I'm going to actually go with my… I'm going to pay 25p more, but they come from Kent…I like that, that makes me feel happy"*

Participant 024, female, Store 2, aged 66-75 years, 'Think aloud' shop

"The first bacon I picked up was the cheapest, but it was Danish bacon and I'm conscious of the fact that British pigs are happier pigs, so we went for the British bacon"

Participant 003, female, Store 1, aged 36-45 years, Autographer post-shop interview

"Yeah, yeah, It's British beef. See that British beef standard. I like to see that… because I don't think you're getting any foreign muck or horsemeat"

Participant 031, female, Store 2, aged 66-75 years, Autographer post-shop interview

A few participants voiced the dilemma they faced when needing to balance personal principles against other influencers – in one instance animal welfare against price and, for another participant, Fair Trade and animal welfare against price and convenience.

"It's always, usually high welfare meat as well, which I kind of like at [name of participating supermarket], but only if it's the right price…yeh, I try to go for free range if I can, if not it's just a general high welfare…"

Participant 007, female, Store 1, aged 36-45 years, Autographer post-shop interview

"Yeah, I mean I would probably go for Fair Trade anyway…If I went into a shop that had – I'm trying to outline the importance of it to you – that had battery, only battery eggs, then I wouldn't… that would be a kind of definite no, a red line, whereas if they only had non-Fair Trade bananas I wouldn't have so many scruples about that…my own beliefs are very much organic, although I'm probably pulled by price when I go into supermarkets…it's something I haven't got for a while but the, again another battle with my wife, she'll buy in now the organic cheese, which is totally hypocritical on me because it's the organic cheese is better for the calves actually…but the Ledemander, which I quite like is, was on offer, and it's especially good if you know, for a man who doesn't have to chop it up or anything. You just put in a bit of bread"

Participant 012, male, Store 1, aged 26-35 years, Autographer post-shop interview

5.3.3 Making healthy choices

Although the healthiness of food was not mentioned by some participants at all, the majority of participants did consider this when they discussed their shopping trip. For some participants, this involved a simple division of products into either healthy or unhealthy categories. When these participants described foods as healthy, the food items could be separated into three separate groups. Participants tended to categorise foods as healthy based on the nature of the individual product (wholegrain/wholemeal products like bread, cereals and pasta; fruit and vegetables; oily fish, eggs, milk, soya milk and vegetarian sausages), whether it could be made into a healthy choice with the addition of other ingredients (for example by adding extra vegetables) and by its method of preparation (such as grilling). Participants tended to categorise foods as unhealthy either based on its individual product characteristics (sugary cereal, chocolate, cheese, pastry, biscuits, mayonnaise and Pot Noodles) or by method of preparation (for example, frying foods). Occasionally, participants incorrectly categorised food products – foods wrongly categorised as healthy included cereal bars and crisps whereas foods incorrectly categorised as unhealthy included olives, hot cross buns and bread.

> *"It's wholemeal bread as I prefer that to white bread now really. I think it started off being a healthy option but I just, I sort of think I prefer the taste to white now really."*
>
> Participant 011, male, Store 1, aged 26-35 years, 'Think aloud' post-shop interview
>
> *"I will buy some smoked mackerel for me and my husband, because it's quite nutritious"*
>
> Participant 013, female, Store 1, aged 56-65 years, 'Think aloud' shop
>
> *"I mean I know, thinking about it. It's very cheesy so it's not, it's pastry, so it's not that good for you at all"*
>
> Participant 001, female, Store 1, aged 36-45 years, 'Think aloud' post-shop interview
>
> *"But this is the sort of thing they love, this thin and crispy cheese and tomato pizza. It's not too bad, or doesn't have a high fat, I don't think, or it's medium fat high, they say, but I will make it extra healthy by adding lots of extra vegetables and some nice low fat cheese"*
>
> Participant 008, female, Store 1, aged 66-75 years, 'Think aloud' post-shop interview

"Well I was just glancing at the cereal bars. I quite often buy those and take them to work for a snack, like a healthy snack to have, and they seem to be quite filling as well"

Participant 006, female, Store 1, aged 46-55 years, Autographer post-shop interview

A small number of participants pondered over the ambiguous nature of some products (pizza, cereal bars and wholegrain sweet biscuits), appearing unsure about whether or not the items were unhealthy or not.

"I was looking at the K bars because she, I wasn't going to phone her at work but I think she does eat Special K bars, but I can never remember which types, ones yeah… and again, they look healthy but I don't know that they specifically are myself, without being a nutrition expert"

Participant 002, female, Store 1, aged 46-55 years, Autographer post-shop interview

Several participants seemed to be making these judgements about the healthiness of foods based on their existing nutrition knowledge or, for a few participants, based on the direct experience of friends. Although some appeared less confident about their knowledge, it was common for participants to report that they believed they selected a healthy diet. A few participants spoke of the difficulties in balancing the desire for healthy eating and the (sometimes conflicting) needs of the family but others spoke of the practical ways in which they tried to achieve a healthy balanced diet at home.

"And I mean I'm aware that you know eating fruit is much better than drinking fruit juice, but I feel, I tend, I probably… actually just recently, I go through phases and sometimes I'd have juice every day…but I know drinking too much of it is not good for you, so I'd probably go for one glass a day…I know it's better to eat the orange rather than drink it but I won't do that every day"

Participant 012, male, Store 1, aged 26-35 years, Autographer post-shop interview

"I know it's a good source of protein for me, but that's about as good as much as I do know"

Participant 004, female, Store 1, aged 36-45 years, Autographer post-shop interview

"I think I eat pretty healthily I wouldn't say I'd know an awful lot about how much you know is a good diet, sort of so to speak, but I think you know on the whole I do"

Participant 018, female, Store 1, aged 46-55 years, Tobii post-shop interview

"It's a struggle obviously, with your family, because they want their treats and things as well and it's getting the balance between treats and healthiness… I do see them [cookies] as a treat as well. I wouldn't let [name of daughter] have, you know I'd let her have a pack of those a day, but she knows that she's still got to have fruit and veg, and we try to get her to five a day"

Participant 026, female, Store 2, aged 26-35 years, Tobii post-shop interview

"For something like chocolate, which we do but occasional sort of fortnightly, once a week treat, I have a rule of like high days and holidays. I wouldn't have it in the week, wouldn't have it like today, I'd have it like only like… We'd have a little bit on Saturday of something like that, and that's a rule we have. And for like my son, he's allowed a treat on Saturday and a Sunday and that's it. The rest of the week he just has yoghurt and fruit"

Participant 016, female, Store 1, aged 36-45 years, Autographer post-shop interview

For a few, specific concern about diet and health was reported either for themselves or for a family member. For these participants a family history of diet-related disease was sometimes reported as a triggering factor in raising their awareness and interest. Some were specifically purchasing with the needs of someone following a 'special' diet in mind. But others seemed much less concerned about the impact of their dietary choices on their health although several participants suggested that they would be more likely to consider the healthiness of an item if they, or a family member, were diagnosed with a diet-related condition. One participant voiced concern which they admitted was not often translated into action.

"I mean I'm particularly interested in the level of sugar, because I come from a family that could have diabetes problems, so I know it and I want to keep this, I could say level under control"

Participant 029, female, Store 2, aged 36-45 years, Autographer post-shop interview

"Like my dad had a stroke recently, and obviously high blood pressure, high cholesterol and that brings sort of, right okay hang on a minute, there's a family history now, need to be a bit more cautious about these things, so don't salt, go for low salt, don't salt anything. So it's just things like that that prompt me to remember"

Participant 017, female, Store 1, aged 26-35 years, Autographer post-shop interview

"Higgledy pies I think they're called, higgledy pies. And we always laugh how expensive they are, but I noticed that they were on special offer, but I know they're really fatty so I put it back. The offer wasn't good enough because my husband's got heart disease so I'm always careful. I like to look, and I think no put it back"

Participant 006, female, Store 1, aged 46-55 years, Autographer post-shop interview

"Only if I had particularly dietary problems, but then of course it's important that you would go out of your way to make sure what you were eating exactly. But in my case it doesn't matter, and for the majority I would think other people aren't too bothered, or they don't care. I don't know"

Participant 009, female, Store 1, aged 66-75 years, 'Think aloud' post-shop interview

"And I think as well, if I had, I mean if there were health problems within the people for whom I'm shopping, or weight issues, that would highlight it far more, but I mean we're very blessed that that isn't the case, so I suppose I'm a bit lax because of that"

Participant 020, female, Store 2, aged 46-55 years, Tobii post-shop interview

"I know I should be a lot more conscientious. [Name of wife]'s very good at doing that, and because I've got Type 2 diabetes so I really should be checking sugar levels and stuff. But I am very bad at doing it"

Participant 023, male, Store 2, aged 46-55 years, Tobii post-shop interview

Some participants did demonstrate examples of decision making in favour of a healthy choice – either by selecting a healthier product or by rejecting the purchase of an unhealthy one. One participant also reported the positive impact she had found following a recent reduction in her sugar intake.

"Well I always buy semi-skimmed milk because apparently it's better for you than full fat milk, and it's, it doesn't taste that different from full cream milk…I mean I don't know how fatty full cream milk is but one has been told that it's better to use semi-skimmed"

Participant 025, female, Store 2, aged 56-65 years, 'Think aloud' post-shop interview

"And I do buy the light version of the mayonnaise rather than the full fat one…to try to avoid the fat in it. Actually my son is addicted to mayonnaise so I'm trying to reduce the amount of fat that he eats…when I'm shopping with my son in mind I'm also looking for the sugar content, the hidden sugar content of things, because he likes lots of fizzy drinks and stuff"

Participant 027, female, Store 2, aged 46-55 years, Tobii post-shop interview

"And I looked at those things in the [reduced] bin, the brioche with the chocolate in…I decided against those, they're not so good for you. I try not to have too much unhealthy stuff"

Participant 026, female, Store 2, aged 26-35 years, Tobii post-shop interview

"I don't want hot cross buns because I'm frightened of getting too fat with six in a packet. If I buy six, I eat six!"

Participant 009, female, Store 1, aged 66-75 years, 'Think aloud' shop

"I really like pork chops but I'm not very good at cutting the fat off and putting it in the bin. So it's easier just not to buy it"

Participant 017, female, Store 1, aged 26-35 years, Autographer post-shop interview

Commonly, participants voiced one of a series of justifications to reduce the impact of deciding to make a less healthy choice. These included giving into temptation, offsetting unhealthy choices by underplaying the risks involved in the choice and deciding that issues of taste, price or preference outweighed the importance of making a healthy choice on this occasion. One participant disputed nutrition recommendations whereas another participant based the purchase of an unhealthy choice on a misunderstanding of existing recommendations.

"I shouldn't have bought them. As I was putting them in I thought oh I shouldn't be buying these"

Participant 019, female, Store 1, aged 46-55 years, Autographer post-shop interview

"I think, for me I think I tend to think well as long as you're getting it right eighty percent of the time you can let things slip a bit, and so…of course per week we're only going to do this twice sort of thing, so that's not really going to make much difference"

Participant 020, female, Store 2, aged 46-55 years, Tobii post-shop interview

"Sometimes you kind of think oh damn it, it doesn't matter, you know I want the sticky toffee pudding and I don't care"

Participant 017, female, Store 1, aged 26-35 years, Autographer post-shop interview

"Often it's something like a cake and it's a treat and it's you know you're not going to eat it every day and it's only going to be a small amount of it"

Participant 001, female, Store 1, aged 36-45 years, 'Think aloud' post-shop interview

"I thought well you know it's chocolate cereal but it's not the most unhealthy thing in the world, even if it's got sort of added sugar and salt…I've got in my head anyway, whether that's accurate…I'm sure it's got added sugar and salt and things but as things go it's not too bad really"

Participant 011, male, Store 1, aged 26-35 years, 'Think aloud' post-shop interview

"I just know that saturated fat is better, and unsaturated fat I presume is more animal fat"

Participant 021, female, Store 1, aged 66-75 years, 'Think aloud' post-shop interview

5.4 Practicality-related themes

Themes discussed in this section relate to meal planning and other practicalities.

5.4.1 Meal planning

Most participants clearly articulated how the food selection they made in store fitted into the meal provision within their household, whether the product chosen was a 'routine', a 'future use' or an 'occasional' purchase. This narrative frequently included issues relating to food preparation and cooking and the 'trade off' needed between preparing meals from basic ingredients and the use of pre-prepared 'convenience' products. Most of the participants bought some basic ingredients to prepare meals at home from scratch although, for some, this involved using pre-prepared components rather than preparing a meal entirely from 'raw' ingredients. Several participants enjoyed cooking food and deliberately selected items during their shop with the preparation of a specific recipe in mind. Others wanted to retain control of meal composition by preparing food from basic ingredients or thought that home-prepared food was better value for money and/or tastier than pre-prepared options. Several participants combined both approaches, selecting some items for scratch cooking but also wanting to have some pre-prepared components (for example, jars of ready-prepared pesto or instant rice) stored 'on stand-by' at home

> *"Aunt Betty's apple crumble…I actually do open a cabinet, pick it up and think that's going to serve two sparrows and I put it back. And then I walk…so then I decide, no that's not going to be very filling so I then close the cupboard, close the fridge door up and I walk back down the shop to look for some cooking apples. So I think, yeah, because I've got some frozen blackberries in my freezer, and I think blackberry and apple crumble, use the blackberries up in the freezer, come back and get some cooking apples, and then that's why I walked back down the shop, to get the cooking apples"*
>
> Participant 006, female, Store 1, aged 46-55 years, Autographer post-shop interview

"Yeah, well I'll sort of pasta at least once a week I think really, so it tends to be a sort of towards the end of the week when we've used up the, most of the sort of fruit and veg that we've bought at the weekend, so we're looking for something that's out of the cupboard really, so by that stage, so it's always nice to know, I like to know that I've got something in the cupboard, so it's ready and waiting for me really…it's quick but without being a kind of like microwave meal, really, yes"

Participant 011, male, Store 1, aged 26-35 years, 'Think aloud' post-shop interview

Pre-packed ready meals were considered by those participants who selected them to be a convenient option when time was limited, if they had to consider the different preferences of family members or when they did not feel like making a meal from scratch.

"We all like lasagne. I tend to buy pre-packed things if we're always going to be out early evening or if I'm not in it's something my husband can shove in the oven for dinner, and we do like them. My daughter is to-ing and fro-ing between us and another house so if she's coming home late and I can't keep a meal cooked for her that amount of time the lasagne and pre-packed things comes in handy"

Participant 002, female, Store 1, aged 46-55 years, Autographer post-shop interview

Some participants selected a pre-prepared item with a plan to add additional ingredients at home, either to stretch the product to feed more people or to improve its flavour.

"I mean yes it's the basic one I normally buy, the one produced by [name of participating supermarket] and I put something else at home. I like fresh products, fresh ingredients as a topping. So I mean I use this one as a kind of basic, I could say the quiche, then I put something else, olives and some more vegetables, cooked apart, as a topping"

Participant 029, female, Store 2, aged 36-45 years, Autographer post-shop interview

Another participant used a pre-packed ready meal as a potential source of inspiration for a home-prepared meal for the family.

"Well the reason, actually the reason I was interested in that one was because if that worked well then I'd consider expanding it and turning it into a main meal for everybody, if I got a recipe for it. It's not something… I don't even know what it's got. Creamy mushroom sauce and white wine sauce, you know it's kind of got a mushy white sauce and maybe if you stroganoffed it a bit, you know, put a bit of spice into it, then everybody would eat it and then I could do a big pot of it."

Participant 022, female, Store 1, aged 46-55 years, 'Think aloud' post-shop interview

5.4.2 Other practicalities

A range of other practical considerations appeared to influence the participants' purchases. These included the amount of time available for the shop, how close the store was to home and the participants' mode of travel to and from the store. Those who walked or travelled by bicycle had to consider how the purchased products could be transported and often considered and decided against a purchase because it would be too awkward or heavy to carry home. On several occasions, participants talked about delaying a purchase until they did an alternative shop at a larger store, when they typically had access to a car. Some of those using a car were concerned about whether or not parking was available – both stores did have a car park but at one store this was often full.

> *"One of the things that I tend to do here that I might not do in another supermarket is not buy things until I need them, because we're so close, we live very close, so I know that it's, unless they're going to run out of something it's still going to be there tomorrow so they might as well store it on their shelves as me store it on mine"*
>
> Participant 013, female, Store 1, 56-65 years, 'Think aloud' post-shop interview

> *"My circumstances have changed recently. I used to do a weekly shop, and I had the use of a car. I no longer have a car, so I now do my shopping in smaller portions on a more regular basis… depending on how many items I need and how many I can carry"*
>
> Participant 010, female, Store 1, aged 46-55 years, Autographer post-shop interview

5.5 Summary

This chapter has presented data which reveals food shopping as a systematic and organised activity. Participants appear to be balancing numerous competing, and sometimes conflicting, factors as they make decisions at point of purchase. A few participants reported that food shopping was a welcome distraction from other day to day tasks, while others framed routine supermarket shopping as a complex activity.

> *"And you lose the will to live don't you? You know you're trying to think about what you need, and you've got this little shopping list in your head, and you might have it written down, and you're thinking about what money you've got to spend and who's going to be in tomorrow, and all those, because shopping's quite complicated… I mean this packaging, it tells you that it's thirty percent more cheese. Well lovely, that's' a marketing ploy isn't it, but it's another set of figures, that when you're trying to process whether it's got nuts in it, whether it's a meal deal, what it's got in it, all of this, what the sell by date is… too much, it's all too much, you know"*
>
> Participant 013, female, Store 1, aged 56-65 years, 'Think aloud' post-shop interview

Although for ease of presentation, the key themes generated from the data have been separated into those related to product-, people- or practicality-related categories, the data also suggest that there is an interaction of factors within and between these. This required shoppers in this study to juggle and trade-off a myriad of different considerations during their purchasing decisions, creating an already crowded space in which engagement with the FOP nutrition label has to take place.

In the following chapter, I present an analysis of the data from participants which relates specifically to their use of the FOP nutrition information panel during their shop. How the FOP nutrition information panel influences participants' purchasing decisions will be examined against this busy backdrop of existing and competing considerations.

6. FINDINGS: USING THE FRONT OF PACK NUTRITIONAL INFORMATION PANEL

6.1 Overview

This chapter provides evidence to inform two of the research questions considered in this thesis, namely:

> In what ways do shoppers use the FOP nutrition information panel during their routine supermarket shopping?
>
> What variations in patterns of use of the FOP nutrition information panel can be identified amongst shoppers doing their routine supermarket shop?

I present findings from the analysis of data provided by the study participants relating to whether or not they used the FOP nutrition information panel during their shop, and their descriptions of its use. As in the previous chapter, the data sources used for this analysis were the audio and transcribed 'shopping' data from the twelve participants who took part in the 'Think aloud' process and the audio and transcribed interview data from all of the thirty one participants following their shop. In addition, data were taken from the questionnaire which participants completed after they had concluded their shop but prior to their post-shop interview.

6.2 Using the FOP nutrition information panel

None of the participants were observed spontaneously using the FOP nutrition information panel during their shop. Only some of the 'Routine+FOP' participants (who were asked to use the FOP nutrition information panel prior to the start of their shopping) were observed actually using this information during their shop.

Most participants gave a consistent report of their FOP nutrition information panel use at interview and via the questionnaire. There was some inconsistent reporting, with a few participants declaring themselves to be non-FOP nutrition information panel users during the interview but reporting its use (rarely and occasionally) on the questionnaire. One participant reported not using the FOP nutrition information panel during the interview but reported using it often on the questionnaire.

6.2.1 Reasons for use and non-use

Table 6.1 provides data illustrations of the reasons participants gave for their use (or non-use) of the FOP nutrition information panel. The most common reason given by participants for using this information was to help them to make direct comparisons between products. They also frequently reported being more likely to check the panel when choosing new or unfamiliar products compared with routine purchases and to assess a product which they considered might be unhealthy. Several participants connected their use of the panel with being more ‘diet’ or ‘health’ aware following a health scare or a diet-related disease diagnosis within their immediate family. Other participants suggested that they would be more likely to use this information if such a diet-related disease diagnosis became relevant to them or if they were managing their body weight. Some participants reported ignoring the implications of the nutrition information panel, having looked at it, because other justifications for their choice were given priority. A few participants reported deliberately avoiding any nutrition information provided on a product because they already knew that the product was a less than healthy choice.

Table 6.1: Reasons for use and non-use of the FOP nutrition information panel

Reasons for use of the FOP nutrition information panel		Reasons for non-use of the FOP nutrition information panel	
To help with direct comparisons between products	*"Oh I might, if I was trying to decide between two, and one had a couple of reds on it and the others were all greens and ambers, and I couldn't decide, yeah, I'd go for the ones without the reds on"* Participant 015, female, Store 1, aged 46-55 years, rarely label user, 'Think aloud' post-shop interview	If I/others like the product and want it	*"I love it, I just love it…* [Did you look at the label?] *No, no, I didn't. I just wanted celery, nut and sultana salad"* Participant 024, female, Store 2, aged 66-75 years, occasional label user, 'Think aloud' post-shop interview
With a new or unfamiliar product	*"I'd only look at it on something that perhaps I haven't had before and I pulled that out and thought "oh, that looks like nice, ooh that's got a bit of a high fat content""* Participant 006, female, Store 1, aged 46-55 years, often label user, Autographer post-shop interview	With a known product	*"These are packaged obviously and they've got them, but I've eaten them before and I'm comfortable with them…I suppose when you're trying something new for the first time, maybe I'll look but after that yes I suppose I don't."* Participant 021, female, Store 1, aged 66-75 years, often label user, 'Think aloud' post-shop interview
On frequently eaten products	*"Always on cereal, because it's something we have every day"* Participant 026, female, Store 2, aged 26-35 years, often label user, Tobii post-shop interview	When buying routine/basic products which do not vary	*"Well do you know what, I usually look at labels. This time I didn't (a) because regardless of the labels I needed these products… I knew I needed some cereal, I needed something sweet and I needed the bread… so I didn't actually look at the labels this time because they were all classed as essential items"* Participant 010, female, Store 1, aged 46-55 years, occasional label user, Autographer post-shop interview
If the product is considered to be unhealthy	*"I think that probably, I got a feeling it's the unhealthier I think a product is the more likely I am to have a look at the label to see. And then at that point I think I'll mull it over and decide whether it's, how keen I am to buy it"* Participant 011, male, Store 1, aged 26-35 years, often label user, 'Think aloud' post-shop interview	If the product is already known to be unhealthy	*"And I didn't read the label because I knew it would upset me!"* Participant 028, female, Store 2, aged 26-35 years, rarely label user, Autographer post-shop interview

Table 6.1: Reasons for use and non-use of the FOP nutrition information panel

Reasons for use of the FOP nutrition information panel		Reasons for non-use of the FOP nutrition information panel	
On pre-prepared 'ready meals'	*"Well I think there's, I feel sometimes that it's a bit of guilt, using you know pre-prepared stuff, so by paying attention to this and trying to damage limitation on calories and saturated fat and stuff like that is kind of, I feel like I'm kind of doing, making the best choices I can"* Participant 017, female, Store 1, aged 26-35 years, often label user, Autographer post-shop interview	If I think a product is not too unhealthy	*"Well, I think I didn't look at it in this case I think just because I assumed that the products I was buying I thought well you know it's chocolate cereal but it's not the most unhealthy thing in the world, even if it's got sort of added sugar and that kind of thing… I'm sure it's got added sugar and salt and things but as things go it's not too bad really"* Participant 011, male, Store 1, aged 26-35 years, often label user, 'Think aloud' post-shop interview
If my/others diet is an issue	*"He always looks at the salt content, because he's lived with high blood pressure all his life. It's genetic, not like mine, which has come with old age"* Participant 024, female, Store 2, aged 66-75 years, occasional label user, 'Think aloud' post-shop interview	If I/others diet is thought to be healthy	*"I'm checking sugar content usually. I'm not really looking at fat or salt, because well basically I don't have to monitor those for myself really. Well I ought to monitor the fat but I don't worry too much… I don't bother because, well I'm on statins, and I know I don't really eat a very unhealthy diet. I don't eat loads of fatty things you know"* Participant 030, female, Store 2, aged 66-75 years, often label user, Autographer post-shop interview
When trying to watch/lose weight	*"And if you were sort of calorie counting or you know trying to lose weight or, again you'd probably take, you know would take more notice"* Participant 018, female, Store 1, aged 46-55 years, occasional label user, Tobii post-shop interview	When weight loss is not a concern	*"No I never look at it* [kilocalories], *no. I exercise like a lunatic and I watch what I eat, so I'm not even fussed…no, I never look at them, saturated fat, yes but calories, no"* Participant 016, female, Store 1, aged 36-45 years, often label user, Autographer post-shop interview
If my/others health is an issue	*"It would be useful, but until I was at a point that I felt my health was a real issue I probably wouldn't take much notice"* Participant 002, female, Store 1, aged 46-55 years, occasional label user, Autographer post-shop interview	If I/others health is not of concern	*"If I had health issues as to blood pressure or diabetes or something like that, I would look"* Participant 007, female, Store 1, aged 36-45 years, rarely label user, Autographer post-shop interview

Table 6.1: Reasons for use and non-use of the FOP nutrition information panel

Reasons for use of the FOP nutrition information panel		Reasons for non-use of the FOP nutrition information panel	
For future reference in store	*"I like Special K and I nearly bought some last week in [name of another supermarket], but then I looked at [name of another supermarket]'s own one and I thought oh I'll have a look at that. But in the little traffic light thing there's a lot of sugar, and more than a normal cereal so I put it back on the shelf, even though it was cheaper I wouldn't buy it… I would buy the normal Special K* [but you didn't on that day?] *No, no, no I was just looking. Now I know for future reference that I would just stick with the normal Special K"* Participant 016, female, Store 1, aged 36-45 years, often label user, Autographer post-shop interview	Relying on existing understanding of product composition	*"Partly because it makes me glaze over a bit, but also because my eyesight's not very good, so actually trying to work out (a) what it says and (b) what it means, I rely more on my knowledge. And I know that's probably a dangerous thing because once food starts to be processed it's not like carrots, you know, it starts to become more complicated. So probably I ought to pay more attention to it, but I don't"* Participant 013, female, Store 1, aged 56-65 years, occasional label users, 'Think aloud' post-shop interview
For information at home	*"He does, he'll say, "Oh, have you seen how much fat this has got in it?" And I'll sort of say, I'll say no because obviously I haven't, I bought it, so no* [it's not something you're using when you're choosing?] *No, no"* Participant 006, female, Store 1, aged 46-55 years, often label user, Autographer post-shop interview	Lack of time or energy/distraction	*"It's probably laziness, not spending enough time in the, you know actually if I was to do my proper shops, without the children, I could focus and think right because that's a balanced meal, that's a healthy balanced meal… but to be fair, if I've got my children with me it's never going to happen."* Participant 004, female, Store 1, aged 36-45 years, rarely label user, Autographer post-shop interview
To warn others	*"And I guess the traffic light sort of stuff stands out. So I suppose if I was concerned about my husband's overeating frequently sort of something or other then I would maybe you know, use the red flags to push at him"* Participant 022, female, Store 1, aged 46-55years, rarely label user, 'Think aloud' post-shop interview	Not noticing it	*"I've probably seen it but I haven't noticed it, if you know what I mean. I haven't looked at it"* Participant 025, female, Store 2, aged 56-65 years, rarely label user, 'Think aloud' post-shop interview

Table 6.1: Reasons for use and non-use of the FOP nutrition information panel

Reasons for use of the FOP nutrition information panel		Reasons for non-use of the FOP nutrition information panel	
		Not used to seeing them	*"I mean I'm not used to having these labels, probably I didn't used to have labels before when I was in a different country… and the labels are different in different places. And you pay probably more attention to labels and to saying, I could say customers, I could say, what there is inside each product. That's not very common in other places. And yes, so I trust the probably labels, but I don't know the right way to read labels at all, that's my problem"* Participant 029, female, Store 1, aged 36-45 years, occasional label user, Autographer post-shop interview
		Use BOP nutrition information instead	*"I, because we're on a special diet I always look at the back of pack, so where I'm, I'm always looking at this kind of information but not usually, it's not usually quite so visible. I wouldn't normally notice that it was on the front because I automatically turn over to the back to look at the ingredients list, and also to look at the fat content"* Participant 003, female, Store 1, aged 36-45 years, never label user, Autographer post-shop interview

6.2.2 Impact on purchasing

Several participants discussed their experience of using the FOP nutrition information panel and its impact on their purchasing decisions. Some described how it 'sometimes' influenced their choice whereas others suggested it 'hardly ever' affected what they bought and a few participants considered it 'never' influenced them.

> *"When I pick it up I do look to see what the content is* [and how often does it affect your choice?] *Oh, quite a lot, yes. Yes, quite a lot"*
>
> Participant 009, female, Store 1, aged 66-75 years, often label user, 'Think aloud' post-shop interview
>
> *"Not a huge amount because normally I know in my head what I'm trying to go and shop and what we need…it's just oh Jaffa cakes look like they're on offer, I'll get some Jaffa cakes"*
>
> Participant 001, female, Store 1, aged 36-45 years, occasional label user, 'Think aloud' post-shop interview
>
> *"Not when I was shopping no. When I get home maybe I'd look at it but not when I'm shopping. It wouldn't influence my purchase… no, it doesn't influence my buying decision, but influence probably how much I ate at home… one packet rather than two or three. So yes it's an eating decision rather than a buying decision"*
>
> Participant 007, female, Store 1, aged 36-45 years, rarely label user, Autographer post-shop interview

6.2.3 A broader context for FOP nutrition information panel label use

For most participants, reported use or non-use of the FOP nutrition information panel was considered within a broader context of their existing diet and nutrition knowledge and an assessment of how their food purchases contributed to their (and their families) total food intake. It is worth noting that, as shown in Chapter 4, the questionnaire data indicate that all of the participants in the study scored either in the top or the middle tertile (58%) for healthy eating. This suggests that they reported consuming a relatively healthy diet, as measured by the food frequency element of the questionnaire.

Participants commonly described their decision making around the use of labels in relation to a judgement of the product based on their prior knowledge.

"Like for example cheese is going to be high fat, we're going to buy cheese and it's going to be high. So it's not going to vary which cheese you buy because of that label, it's going to be pretty much the same"

Participant 001, female, Store 1, aged 36-45 years, occasional label user, 'Think aloud' post-shop interview

"You know some things are just obviously high in fat and you know that anyway… I just know it's [peanut butter] high in fat anyway so I probably wouldn't check it every time"

Participant 019, female, Store 1, aged 46-55 years, often label user, Autographer post-shop interview

"I don't think I, you know, I know too much to look at those labels, but you know I tend to know that, you know, if you've got a vegetable product it's going to have fibre in it and it's not going to have a load of refined sugar in and it's not going to have fat in necessarily, and if it's got sauce in then it will have some fats and sugar in. You know, so I think you know I don't disdain them completely but I don't tend to automatically look at them"

Participant 022, female, Store 1, aged 46-55 years, rarely label user, 'Think aloud' post-shop interview

Although several participants talked confidently and correctly identified the nutritional attributes of a particular product, some participants made errors in their judgements or demonstrated a significant gap in their existing nutritional knowledge.

"I glanced at it. I didn't look at the fat content but I know it's got a high fat content because I know it's got a big pastry on it., it's got lots of pastry on it, so I know for a fact. And it was chicken and leek I think, so I know that's got a white sauce, so that's probably going to be pretty high fat content [chicken and leek pie, non-purchase]"

Participant 006, female, Store 1, aged 46-55 years, often label user, Autographer post-shop interview

"Well that is now quite alarming because the sugars are high… very high, but then I know in general cereals have a lot of sugar, so what I might have done had I looked at that at that point, I may have compared that to the Kellogg's [bran cereal, 30g portion: Sugars – red, 5.1g, high, 6% adult RI]

Participant 010, female, Store 1, aged 46-55 years, occasional label user, Autographer post-shop interview

"I think of chicken [chicken Kiev] and, probably that chicken in its breadcrumbs… yeah, they're fried aren't they so yeah. So I think that was, it's not sort of fried, it's just breadcrumbs"

Participant 018, female, Store 1, aged 46-55 years, occasional label user, Tobii post-shop interview

> *"It's the fat that's in a lot of processed foods I know… I just know that saturated fat is better"*
>
> Participant 021, female, Store 1, aged 66-75 years, often label user, 'Think aloud' post-shop interview
>
> *"That saturated fat looks quite a lot actually… well, it says eleven percent, that's compared to this, fat, six percent. I suppose they're… I don't know what fat… and this is saturated fat – I don't know, you know, what the difference is really"*
>
> Participant 025, female, Store 2, aged 56-65 years, rarely label user, 'Think aloud' shop

Others appeared less confident in their knowledge and acknowledged that using the FOP nutrition information panel might have a role in verifying their existing knowledge or supporting them to make healthier choices.

> *"And I think, because I've been vegetarian I've relied on that as a way of thinking well actually I should be pretty healthy because I eat vegetables. So I've relied on that in my knowledge but I'm beginning to realise that maybe I should actually use these rather as guides than not"*
>
> Participant 004, female, Store 1, aged 36-45 years, rarely label user, Autographer post-shop interview
>
> *"Yeah, I would have a look, yes, to see if my understanding of… do I think this product has a lot of sugar in and, or something like that, because I can take a guess like I can with all of these sort of things, because I know there's a lot of sugar in those things"*
>
> Participant 010, female, Store 1, aged 46-55 years, occasional label user, Autographer post-shop interview
>
> *"Because it's still natural rather than processed products… that would be my thinking. But obviously when you look at the fat content of those, it's actually a lot higher than you'd expect"*
>
> Participant 027, female, Store 2, aged 46-55 years, often label user, Tobii post-shop interview

Several participants voiced concern about their lack of detailed understanding of current nutritional recommendations which some reported as a barrier to a full interpretation of the information provided on the label. One participant commented that using the traffic light labelling removed the need to memorise these benchmarks. Another participant was unsure about the typical composition of staple foods, making it difficult for her to decide if one product was a healthier choice than another.

"You're meant to sort of think about how much salt they [daughter] have. But I don't know off the top of my head what the numbers are I'm really looking at for salt, probably should have a look into that a bit more…yeah, obviously that one's orange on the salt front, so you think oh, is that, is… I'm thinking now is normal bread orange on the salt front? I don't know, it probably is"

Participant 001, female, Store 1, aged 36-45 years, occasional label user, 'Think aloud' post-shop interview

"So you know, I know a fair amount about health but I wouldn't…if you said what's the you know, percentage sugar you should be taking per day and all of the other like constituents, protein, carbohydrates, everything else, I wouldn't have a clue"

Participant 012, male, Store 1, aged 26-35 years, never/often label reader, Autographer post-shop interview

"The size of a portion, that seems to be a mystery to a lot of people, including me… I mean I know the five a day thing's a bit mysterious really but everybody knows the five a day thing, but people don't in general. I've asked the kids in the past... because they don't eat fruit in general so I'll say "Go on, eat and apple, half an apple will do", will it? Not too sure you know"

Participant 022, female, Store 1, aged 46-55 years, rarely label user, 'Think aloud' post-shop interview

"[Do you ever look at the figures?] *No, which is very bad, because it should register with me. But no I don't because I don't have a benchmark in my head about what to compare them with"*

Participant 023, male, Store 2, aged 46-55 years, occasional label user, Tobii post-shop interview

Commonly, participants reported that they assessed the nutritional information of a product in relation to their judgement of the frequency of purchase or consumption of a particular food over a period of time.

"And also, as I said, if it's high in sugar it doesn't particularly bother me, because the majority of stuff I use is low in sugar, so it's not an issue for me"

Participant 009, female, Store 1, aged 66-75 years, often label users, 'Think aloud' post-shop interview

"I tend to think that we just have one main cooked meal a day, and I more or less have an idea of what's reasonably healthy…we don't tend to have a lot of puddings or cakes with the meals, we tend to have fresh fruit afterwards, sometimes some yoghurt, something like that, but I don't tend to worry too much if there's reasonably high on fat here because I don't think we're going to have a huge amount on that day. And because we vary it and we have it with quite a bit of salad as well so I'm fairly happy with them [meatballs, 175g portion: Fat – red, 33.4g, high, 48% adult RI]"

Participant 021, female, Store 1, aged 66-75 years, often label user, 'Think aloud' post-shop interview

"They're not always on the shelf, and they're high in saturates. I can see that now. But I didn't look at it, I just wanted my minted lamb burgers. We have them very rarely, perhaps, whenever I can get them. They go in the freezer, and I think what are we going to have for tea, oh we'll have a minted lamb burger. But we have them with loads of veg, you know we don't have them with chips or anything, we always have them with fresh vegetables, so I feel that that's quite a healthy option [burger, 114g portion: Saturates – red, 9.6g, high, 49% adult RI]"

Participant 024, female, Store 1, aged 66-75 years, occasional label user, 'Think aloud' post-shop interview

"I did look at them a bit but I tend to know that I shouldn't eat too much salami because it's got a lot of fat and a lot of salt in it, so we don't eat lots and lots of it"

Participant 027, female, Store 2, aged 46-55 years, often label user, Tobii post-shop interview

"I do look at it, as I say. I know the fats, I know the saturates are high and the salt's high, but it's not, I don't eat a lot of them. It's something that I've got there in the freezer just, I can't be bothered to eat anytime. So this is something that I wouldn't eat a lot of… if you're only having that occasionally, once a week, I don't think it's going to do you any particular damage"

Participant 031, female, Store 2, aged 66-75 years, often label user, Autographer post-shop interview

6.2.4 Other issues which influence FOP nutrition information panel label use

Participants reported a range of other issues which impacted on their engagement with the FOP nutrition information panel. Several participants described the panel as being too small or, when referring to a monochrome % RI design, being difficult to see. Others said they were distracted by other information which also appeared on the front-of-pack.

"I wouldn't even, that wouldn't even jump out at me because there's no colour on it. The blue is the same as this, so I didn't even look at that"

Participant 026, female, Store 2, aged 26-35 years, often label user, Tobii post-shop interview

"But it's, yeah, it's, I don't think that's there to stand out. It blends in with the rest of the package…it's hidden in the corner, you've got this nice big shiny pack and, you know I'd look more at the Fair Trade than that, to be honest"

Participant 002, female, Store 1, aged 46-55 years, occasional label user, Autographer post-shop interview

Some participants reported having seen that nutrition information was presented on-pack in different formats in different supermarkets and by different food producers. This,

alongside differing presentations of portion size and serving suggestions, appeared to cause confusion and made using labels more difficult.

> *"It would be easy if they are all consistent, so they're put in the same place, you don't have to go searching round the back to look at things. But it's just consistency, I know some do the traffic light system and some don't"*
>
> Participant 007, female, Store 1, aged 36-45 years, rarely label user, Autographer post-shop interview
>
> *"It's presented in different ways by different manufacturers, yeah just to complicate things"*
>
> Participant 003, female, Store 1, aged 36-45 years, rarely label user, Autographer post-shop interview
>
> *"I was very confused about the labelling on the front because I kind of compared it to exactly the same quantity of Scott's porridge oats, which I think it's the same kind of you know product. But yet the labelling's wildly different. But it was explained to me that the labelling on the very cheap porridge oats included the milk, when you made it into porridge, but you might make it with water actually, mightn't you"*
>
> Participant 025, female, Store 2, aged 56-65 years, rarely label user, 'Think aloud' post-shop interview

A key element of the provision of any on-pack nutrition information and its subsequent use by shoppers is the trust implicit within the contract between the consumer and the producer or retailer. A few participants spoke of their belief in the trustworthiness of the information which was provided whereas others appeared slightly more sceptical about the potential difficulty, particularly for manufacturers, in providing this information in a transparent and honest manner.

> *"But you wouldn't expect manufacturers to put you know "Watch out, this is fatty" on there, because it would put people off. So I don't know how that reconciles itself really, because they're obviously going to be trying to, although you know the [name of participating supermarket] actually is, purports to be ethical , so they ought to be up front about everything. But a manufacturer, this manufacturer is not going to put "Watch out guys, this has got tons of sugar in it" are they?"*
>
> Participant 013, female, Store 1, aged 56-65 years, occasional label user, 'Think aloud' post-shop interview
>
> *"I think I'd want [label information] to be independent, because otherwise they could just put what they wanted on it. I'm not saying I wouldn't necessarily trust manufacturers but their definition of low, unless it is actually as a standard, would be standard, I don't know how it's done but I think it should be regulated…*

because otherwise they could say it's low, you know low salt in it, and it might be their definition of low salt"

Participant 016, female, Store 1, aged 36-45 years, often label user, Autographer post-shop interview

"When I have time I do notice that often you can get caught out, in that it will say 'per serving' and it's often… my daughter certainly would wolf that down without breathing, the whole thing, whereas obviously we're talking about half of it here and it's a 250g pack so they have obviously, you have to double those figures…I have got caught out several time with this business of the serving, and actually it's all very clever and obviously it's designed to try to make the thing look much healthier, but I'm always amazed at how small the servings of anything are… I mean you would think with a small pack like that, that that would be referring to the pack, particularly as it doesn't say serves two or anything on it"

Participant 020, female, Store 2, aged 46-55 years, often label user, Tobii post-shop interview

"*There have been news stories about the fact that sometimes they're maybe not as meaningful as manufacturers try and make them out to be. My heart wishes, wants to trust it, my head is slightly more wary"*

Participant 023, male, Store 2, aged 46-55 years, occasional label user, Tobii post-shop interview

"Although if I was looking at biscuits, they're probably all red, which is why they've probably chosen to put a monochrome one on a packet of HobNobs [why do you say that?] *because probably several of those are red, and therefore they don't want to put their packet on the shelf with loads of red on, do they?"*

Participant 028, female, Store 2, aged 26-35 years, rarely label user, Autographer post-shop interview

Although most participants appeared to consider providing nutrition information as a legitimate part of the remit of food producers and retailers, one participant was concerned about how this information was received by consumers.

"You've got the problem around it, people really don't like being told what to do, do they? They don't like being told what they should and shouldn't eat"

Participant 030, female, Store 2, aged 66-75 years, often label user, Autographer post-shop interview

6.3 Format of the FOP nutrition information panel and its different components

6.3.1 Format

A range of views were expressed about a preferred format for the FOP nutrition information panel. One participant suggested that they preferred the format of the BOP nutrition information panel because it provided more detailed information than shown on the FOP nutrition information panel and other participants preferred the BOP label because they were more familiar with its format.

> *"But this isn't helpful in a way because it doesn't tell you if it's polyunsaturates or monounsaturates. It's not very, it's simple but it doesn't give the whole picture"*
>
> Participant 007, female, Store 1, aged 36-45 years, rarely label user, Autographer post-shop interview

Amongst most of the rest of the participants, there appeared to be a general preference for the hybrid FOP nutrition information panel (which is commonly seen in the participating supermarket) compared with the monochrome % RI type of format, although a few participants declared no particular preference. The reasons participants gave for this preference included clarity and ease of use.

> *"Well I think it's a very good idea. I mean, you know in the past, before they started this labelling, you know you'd be scratching around on the back and thinking well what's this and what's that and you didn't know what it was. And this is more clear"*
>
> Participant 009, female, Store 1, aged 66-75 years, often label user, 'Think aloud' post-shop interview

> *"The traffic light system is a lot easier, and that's you know going from someone with probably more than, you know, above average knowledge of nutrition. Certainly it makes it easier, because it, you know the percentage RDA is sort of quantitative and then then traffic light system is qualitative isn't it, and it's more eye-catching, you don't have to mess around with the figures"*
>
> Participant 012, male, Store 1, aged 26-35 years, never/often label user, Autographer post-shop interview

"Ah, they're not coloured… it makes my life harder because I can't just go, oh it's red, I don't want that one"

Participant 028, female, Store 2, aged 26-35 years, rarely label user, Autographer post-shop interview

"Low, high, yes. So actually even if I've forgotten my reading glasses and I couldn't read it, I could just look for the green light basically, couldn't I and say that is a healthy…"

Participant 030, female, Store 2, aged 66-75 years, often label user, Autographer post-shop interview

6.3.2 Colour-coding

The majority of participants responded positively to the concept of colour-coding/traffic light colours on the FOP nutrition information panel. A few participants said they preferred using other nutritional information to traffic light colours (such as the BOP information, text descriptors or % RI figures) and one participant articulated her own preferred design for a colour coding system which used density or strength of colour in place of traffic light colours. Most participants, however, could articulate an understanding of the underlying theory behind the concept of traffic light colours and also its practical application, as shown in table 6.2, although this did not always translate into a healthier purchasing decision. For some, an added attraction to using traffic light colours was the speed with which they could be used.

"I like the traffic light system best, and the [name of participating supermarket]'s quite good there because they do show these colours. I mean all the things I've picked here. All the big reds sticking out on it… [in what way would you use them?] *Well I suppose just by taking note of how much red there is particularly on it and whether there is any green at all. At least there's some…"*

Participant 021, female, Store 1, aged 66-75 years, often label user, 'Think aloud' post-shop interview

"Yeah just sometimes when you pick something up and it's got red, the red things on it, you think oh wait a minute, you know, let's have a quick look and see what this is. And sometimes you know, you're picking up a bar of chocolate and you know it's going to be high fat, but sometimes things that maybe you don't expect to be quite so high, you take notice of that"

Participant 001, female, Store 1, aged 36-45 years, occasional label user, 'Think aloud' post-shop interview

"I mean at the moment I would say I'm taking more notice of this, but in the past I haven't done at all, so if I wanted something because I liked it I would just have it regardless of this. But this is kind of more prominent now, and lots of shops have got their own version of this, so I think it makes it easier rather than trying to remember what something is or how many Weight Watcher's points it is. You can kind of look at that and take it as a basic"

Participant 017, female, Store 1, aged 26-35 years, often label user, Autographer post-shop interview

"Well once I'd seen the colour, just sort of read a bit, I mean again it's the fat content initially. But I mean I guess I don't sort of put it into, I mean I don't know how much sort of fat it should have, if you see what I mean. But I thought it was reasonable. Although that saying that's, it's red is obviously the traffic light system, obviously is not so good or it's higher, more content… but it didn't make me decide not to get it"

Participant 018, female, Store 1, aged 46-55 years, occasional label user, Tobii post-shop interview

There was some confusion, however, about the traffic light colours (or, in one instance, a monochrome format without traffic light colours) either because participants seemed to misunderstand the purpose of the colours or its interpretation.

"I don't understand why fats and salt are in the same colour. No I don't understand why they're in the same colour code, yes. And like sugars, I think too much sugar is not very healthy, but how can sugar it's in green because I always think green is related to healthy… know like what is fat and what is salt, but I don't understand why they're in the same colour code."

Participant 005, female, Store 1, aged 36-45 years, occasional label user, 'Think aloud' post-shop interview

"So I guess they're all just neutral colours, and that makes you even less likely to look at them. So I don't know whether beige just means below the scale, under green, under amber, I don't know. But beige is kind of, you know you don't, you sort of think it's neutral"

Participant 022, female, Store 1, aged 46-55 years, rarely label user, 'Think aloud' post-chop interview

"It's nice and clear, it shows the sugars in red, though I don't see why they're low down because I always expect to find the highest one at the top, or at the start, if you're reading from left to right. And here, although the sugar is the highest in it, everything else is one percent, one percent and trace. It shows it's in red, so it's nice and clear to see, but I would expect it to be at the top [the nutrients are always in the same order] always in the same order. Yes I see what you mean. Yes so the fat is always at the top. Do you know I hadn't picked up on that"

Participant 008, female, Store 1, aged 66-75 years, occasional label user, 'Think aloud' post-shop interview

"And then I presume that the traffic lights is talking about daily intake, daily diet needs, and that that's what it's measuring against"

Participant 021, female, Store 1, aged 66-75 years, often label user, 'Think aloud' post-shop interview

6.3.3 Grams

Several participants commented on the presence of gram labelling within the FOP nutrition information panel. Most of these participants did not use it, reporting it to be confusing and difficult to understand. One participant found the gram figure useful in comparison tasks where she adopted a simple approach, choosing the product with the lowest gram content of a specific nutrient of interest, but several participants said they were unsure about how to interpret this information and reported simply ignoring the figures.

"I'm not looking at anything else, just the grams… [how do you decide?] *Well if I'm buying the product anyway I'll just go by the lower* [so you're comparing?] *it's very simple, yes"*

Participant 019, female, Store 1, aged 46-55 years, often label user, Autographer post-shop interview

"I don't understand the grams bit, to be honest… do you know what, I haven't got a clue. Because I don't understand the grams, is that per, no I don't, no I don't get that. Do you, whatever grams this pack is, do I add all them together and that comes to the total of, to eighty grams?"

Participant 015, female, Store 1, aged 46-55 years, rarely label user, 'Think aloud' post-shop interview

"I'm not going to you know go round with a pocket calculator saying well that's got x grams of fat and that's got x number"

Participant 022, female, Store 1, aged 46-55 years, rarely label user, 'Think aloud' post-shop interview

6.3.4 Text descriptors

Participants commonly commented on the text descriptor (High, Medium or Low) part of the FOP nutrition information panel. The majority of participants reported seeing these words, most assigned a literal interpretation to this part of the label and some reported its

use during decision making. A few participants described using the text descriptor labels to confirm their initial interpretation of the traffic light colours and one participant suggested that the text descriptor component was easier to recall than the traffic light colours assigned to a product.

One participant, however, appeared not to understand their meaning and others reported not being aware of using them, either because they rarely used the FOP information or because they preferred to use the traffic light colours and considered the descriptors to be unnecessary.

> *"Low in fat, medium saturates, medium salt, everything. It's all there, all the information's there… I don't like the high in sugar"*
>
> Participant 014, male, Store 1, aged 46-55 years, always label user, 'Think aloud' post-shop interview
>
> *"I did look at the fat content and saw that it was low…it was the actual words on there rather than the green, yeah, I mean I'm very aware of the traffic light scheme but to be honest it's not the colours that I was registering, it was the sort of the words low…I was looking at the words rather than the colours when I chose those"*
>
> Participant 023, male, Store 2, aged 46-55 years, occasional label user, Tobii post-shop interview
>
> *"No the colours, I would never remember if you asked me tomorrow what colour the salt light and what colour was the* [but you would remember it if it was medium] *yes, yeah, I would"*
>
> Participant 024, female, Store 2, aged 66-75 years, occasional label user, 'Think aloud' post-shop interview
>
> *"No, because the colours are already telling me that, so I don't need them [descriptors]*
>
> Participant 028, female, Store 2, aged 26-35 years, rarely label user, Autographer post-shop interview

Table 6.2: Participants' interpretation of the meaning and action required with traffic light colours

Traffic light colour	Participants' description of the meaning of the colour	Participants' interpretation of action prompted by the colour	
Red	*"Bad for you"* *"More/High"* *"Not so good"* *"Danger/Alert"* *"Got to be careful"* *"Naughty"* *"Only for emergency meals"*	*"Avoid red"* *"Avoid red in comparisons"* *"Avoid any red versus avoid some red nutrients"* *"Take notice of red"* *"Red leaps out/pay attention"* *"Think twice about red"* *"Avoid red unless it's a treat"*	*"I would be looking out for reds* [if you saw reds what would you do?] *If they were seriously high then I wouldn't buy it"* Participant 020, female, Store 2, aged 46-55 years, often label user, Tobii post-shop interview *"I can now look and think oh that one's got red in that one hasn't got red in. I might go without glasses for the option without red in, if I'm making a decision between two things"* Participant 024, female, Store 2, aged 46-55 years, occasional label user, 'Think aloud' post-shop interview *"I'd be more fussed about fat and salt than I would sugar actually because I don't eat a lot of sugar so I could let that go. But I wouldn't want lots of fat and lots of salt. In particular, I wouldn't want the salt to be red. That's quite important… I would perceive it as more damaging really…salt, health-wise"* Participant 016, female, Store 1, aged 36-45 years, often label user, Autographer post-shop interview
Orange	*"Medium"* *"In moderation"* *"In the middle"* *"Neutral"*		*"Well, that's medium, so I don't mind that. So there's no red"* Participant 010, female, Store 1, aged 46-55 years, often label user, Autographer post-shop interview
Green	*"Good"* *"Healthy"* *"Very good"* *"The best one"* *"OK"* *"Have as much as you like"*	*"Go for a product with more greens"* *"Check to see whether there is any green"*	*"And then green is the best one. You want everything to be green really I suppose"* Participant 019, female, Store 1. Aged 46-55 years, often label user, Autographer post-shop interview

6.3.5 Percentage Reference Intake figures

Participants reported mixed views about the % RI figures shown on the FOP nutrition information panel. Several participants said they could correctly interpret the figures.

> *"Coupled with the percentage, I mean this tells me that I can eat three of these a day and then, but nothing else, in terms of my fat. So I then perhaps would say okay what else am I going to have today, and how is that going to fit into the hundred percent. But often I wouldn't even go there"*
>
> Participant 020, female, Store 2, aged 46-55 years, often label user, Tobii post-shop interview

Other participants reported either not understanding % RI figures or dismissed them as unhelpful, confusing or too time consuming to use. Despite participants' previously reporting the need for a fuller understanding of benchmarks against which to consider a choice, only a few participants could articulate the rationale behind the provision of these figures (as a guide to the contribution a portion of the particular food makes to a total average daily intake of a specific nutrient) and participants commonly misunderstood the nature of the figure shown on the pack.

> *"I can't do the maths, not because I can't do maths but because I can't hold all of that in my head. You know you can only hold, can't you. I can't hold how much somebody should have in a day in my head and calculate whether this is what proportion, I can't do it"*
>
> Participant 013, female, Store 1, aged 56-65 years, occasional label user, 'Think aloud' post-shop interview
>
> *"Ah, I thought it was this is fifteen percent fat. That is not what it's saying, it's saying it's fifteen percent of an adult's intake"*
>
> Participant 028, female, Store 2, aged 26-35 years, occasional label user, Autographer post-shop interview

6.3.6 Specific nutrient and energy labelling

Participants' demonstrated a range of priorities when turning their attention to the specific nutrients present within a product. The most common priority amongst participants appeared to be fat content, although interest in fat was not universally reported. However,

most participants reported that they would look at the fat labelling and several participants registered a high alert for products with high fat labelling.

> *"The only thing I'm normally looking for is that fat content on something because usually a lot of the fat's hidden in the products and you're not aware of how fatty is actually is. I'm always amazed at how many foods have got fat in that you would never expect to have fat in at all"*
>
> Participant 027, female, Store 2, aged 46-55 years, often label user, Tobii post-shop interview

> *"No salt is the main thing with me, salt and fat are the two that I don't really like. If I'm comparing, I think if I'm comparing two products, that's when I would use it, not just for one. If there are two or three there I would just check to see which one was the lowest* [between salt and fat, are they the same or are they different in your ranking] *Probably fat. I like to have less fat. Sugars don't bother me so much, it's the fat and the salt, but mainly the fat"*
>
> Participant 019, female, Store 1, aged 46-55 years, often label user, Autographer post-shop interview

> *"I wouldn't buy something that I thought was grossly unhealthy, but I don't exercise enough, probably enough scrutiny of things like fat content"*
>
> Participant 013, female, Store 1, aged 56-65 years, occasional label user, 'Think aloud' post-shop interview

> *"I wanted a biscuit and I got put off my choice of digestive chocolate biscuits because of the, I think there was a huge fat content in them which I hadn't actually noticed before [Crunch cream biscuits, per biscuit: Fat – 3.7g, 5% adult RI, Saturates – 2.1g, 11% adult RI]"*
>
> Participant 025, female, Store 2, aged 56-65 years, rarely label user, 'Think aloud' post-shop interview

Some participants articulated the healthier eating message to reduce total fat intake but few could recall specific current recommendations. However, several participants demonstrated that they either had altered or might change their choice based on being alert to the fat label.

> *"And fat, just that you're generally not supposed to eat too much. I can't remember what the daily limit is"*
>
> Participant 016, female, Store 1, aged 36-45 years, often label user, Autographer post-shop interview

"My husband has biscuits that he takes to work. And we've recently been buying shortbread quite a lot, but this is me picking the HobNobs – partly because they're his favourite and partly because they were on that offer, buy two for two pounds but also because they are also much less fat than the shortbread [HobNob biscuit, per 5.2g biscuit: Fat – 3.1g, 4% adult RI]"

Participant 028, female, Store 2, aged 26-35 years, rarely label user, Autographer post-shop interview

Being conscious of the saturated fat in a product was more commonly expressed by participants than an interest in sugar or salt content, although interest in saturated fat was less frequently cited as important to the participants' than total fat content.

"But if it was something that I though wasn't healthy, like a cheesecake or something, then I'd have a look at the sort of saturated fat and then think Oh that looks a bit, I'd be expecting it to be high but sometimes it's higher than you expect and you think oh no I'd better leave that one

Participant 011, male, Store 1, aged 26-35 years, often label user, 'Think aloud' post-shop interview

"I have to say I've never really looked at these kinds of labels before, but they are very useful because one of the things that I'm very conscious of is the amount of saturated fat in my diet, and it's very useful having it separated out like this, because obviously in some cases the fat content doesn't tell you enough, but having the saturated fat as well is quite useful"

Participant 003, female, Store 1, aged 36-45 years, never label user, Autographer post-shop interview

"Obviously if I had an illness, I mean I do have cholesterol that I have to, I take cholesterol tablets and statin, but I don't think of that in terms of when I'm shopping"

Participant 002, female, Store 1, aged 46-55 years, occasional label user, Autographer post-shop interview

Although some participants reported being interested in the salt content in products, this was a less common concern than appeared to be shown for fat and saturated fat. A few participants did seem to be aware that reducing salt intake was important, but others seemed more confused. Those who said they were alert to salt content suggested this was because either they had high blood pressure themselves or had a family history of cardiovascular disease.

"Probably the fat and the salt would be the ones that I would be most acutely aware of and that's because, again, looking at my daughters, they love things like

crisps, so I'm very aware that they're already getting quite a lot of salt. So I don't want to be adding to that with other things"

Participant 020, female, Store 2, aged 46-55 years, often label user, Tobii post-shop interview

"I wouldn't be that confident, only in as I say just the ones that I perhaps recognise, so saturates and well sugar, obviously, you're not supposed to have lots of sugar but I noticed sodium was one of the things that was bought up in your survey but I wouldn't have a clue on that"

Participant 006, female, Store 1, aged 46-55 years, often label user, Autographer post-shop interview

"I've bumped into people up here that you know they're looking for the sodium content because somebody in the family's suddenly diabetic or whatever and they have said they have to look really closely to distinguish what's meant. You know I mean we don't tend to see salt as such on the thing, it's just got sodium, and it's things like that you know sodium's salt but the labels baffle you, or baffle me"

Participant 002, female, Store 1, aged 46-55 years, occasional label user, Autographer post-shop interview

"Sometimes we don't know how much salt is in a thing and you know if it says it's an enormous amount of salt or an enormous amount of sugar, I might avoid it

Participant 025, female, Store 2, aged 56-65 years, rarely label user, 'Think aloud' post-shop interview

A specific interest in the sugar content of products was also reported by some participants, but although one participant demonstrated a sound understanding of current recommendations on sugar intake, other participants appeared to be less sure about what counted as a healthy choice. A focus on the amount of sugar in the breakfast cereal and biscuit categories were most frequently mentioned by participants who reported an interest in the specific sugar labelling, although making a healthy choice within these categories did not always appear to be straightforward.

"And sugars, yes I mean sugar is really a problem I think in this country more than in others, because all the products are really full of sugar…and I think I can't really avoid to eat a lot of sugars in this place"

Participant 029, female, Store 2, aged 36-45 years, occasional label user, Autographer post-shop interview

"Well anything over twenty is very high…yes twenty percent, twenty percent. So something that's about ten would be fine, and anything below ten is not really to worry about… that's my rule of thumb, that's what I was told by the nutritionist to look for really. Because some things you can look at, they're forty, they're thirty or forty percent sugar"

Participant 030, female, Store 2, aged 66-75 years, often label user, Autographer post-shop interview

"So if I was picking a breakfast cereal for my daughter, I would look at two and I'm sure that if there were, see my husband eats nonsense breakfast cereal like Crunchy Nut Cornflakes, so if I was choosing something to buy for the family, I would go well these are multigrain boulders, or whatever, have however much more sugar in it than these ones, so we'll buy those ones…the one with the least sugar in, so I'll buy that one, 'cos I'm going to give it to my daughter as well"

Participant 028, female, Store 2, aged 26-35 years, rarely label user, Autographer post-shop interview

"And then I spot those, then I thought [name of daughter] can have some of those for a snack, they're a pound and they haven't got chocolate on them, I know they've probably got sugar in. I just thought they can't be as bad…I didn't look at this bit. I might have done if I'd have not been with [name of daughter] and been concentrating more. But looking at it now, when I look at that I think that's quite good to me, and when you compare it to some other chocolate bars and things, a hundred and sixteen calories is not, doesn't seem that much to me… I didn't used to look at sugar but I have been more. That doesn't really make much sense to me. I think that's quite a lot, 8.1grams, but…[Fruity nibbles biscuits, 25g portion: Sugar – red, 8.1g, high, 9% RI"

Participant 026, female, Store 2, aged 26-35 years, often label user, Tobii post-shop interview

Only a few participants looked at energy content as a priority, with some associating the energy content with body weight management and one participant using the energy content as a proxy for total nutrient content.

"I like the calorie count. I'm not exactly watching my calories but I do like to be aware. And sometimes you think, you look at something and you think my God you know why is that so high in calories"

Participant 009, female, Store 1, aged 66-75 years, often label user, 'Think aloud' post-shop interview

"I mean I do sometimes look to, sort of calorie wise although I'm not sort of strict with myself…so although I'm not one of these people, I'm not so calories sort of thinking I've got to count how many calories I'm eating in this meal or that meal or a day, but I do take notice"

Participant 018, female, Store 1, aged 46-55 years, occasional label user, Tobii post-shop interview

"For me again just this thing of the energy, which should be useful but appears almost too detailed, for me, this what it is, the what those [kilojoules] No I don't know how many calories we actually have in our intake"

Participant 021, female, Store 1, aged 66-75 years, often label user, 'Think aloud' post-shop interview

"One of the reasons I focus on calories, because calories is kind of compound isn't it, it's made of both fats and carbs, and I wouldn't look at you know carb percentage or fat percentage in particular. I would look at calories more always"

Participant 012, male, Store 1, aged 26-35 years, never/often label user, Autographer post-shop interview

Although some participants indicated an interest in more than one specific nutrient, several participants appeared to struggle to appropriately assess a product when more than one nutrient needed to be considered. In some cases, they discounted the information provided on the food label because they considered it a treat or an infrequent purchase. A few participants demonstrated a reassessment of a product's suitability, having considered the information provided on the FOP nutrition information label more fully.

"Well looking at it now it, that says high on fat content, high on saturates, but I'm not really and that's fatty something or other but I don't know what. If I was buying this on a regular basis then it would put me off buying it on a regular basis, but because it's something that might be bought once a week I would still buy it… the salt is high actually, it says as well. And yeah, it's slightly putting me off this now [lasagne, 400g portion: Fat - red, 38g, high, 55% adult RI, Saturates - red, 16.4g, high, 82% adult RI, Salt – red, 2.2g. high, 36% adult RI]"

Participant 002, female, Store 1, aged 46-55 years, occasional label user, Autographer post-shop interview

6.4 Confidence in using the FOP nutrition information panel

All participants were asked how confident they felt in using the FOP nutrition information panel. Most participants reported being confident to use labels, with only two participants describing themselves as unconfident. Several participants, however, also reported feeling confused either in general about using labels or over specific aspects of the label.

"Twenty five percent energy, twenty six percent energy, thirty nine I mean what does energy mean? I don't know what energy means… Fat, saturated fat, sugars and salt. But they're, no I've absolutely no idea what any of that…"

Participant 025, female, Store 2, aged 56-65 years, rarely label user, 'Think aloud' post-shop interview

"I feel fairly confident. I think it's really good that it's like this now rather than what it, what you know that's what it used to be… but not it's just almost like it's right there. I feel it's you know a vast improvement on people kind of having to use their own knowledge and make their own judgements about what's high or what's low on something"

Participant 017, female, Store 1, aged 26-35 years, often label user, Autographer post-shop interview

6.5 Impact of study participation

Involvement in the study itself appeared to influence some participants, with several reporting that they understood the purpose and practical application of the FOP nutrition information panel having discussed it during the research whereas they previously had found it difficult to understand. A few participants said that they had been unaware of the presence of traffic light colours prior to taking part in the study. For at least some, the reason given for this was because they had previously focused attention on the BOP or on the figures shown on the label

"No I hadn't been aware of the different colours I don't think [some of these will be red, some will be amber and some will be green] *yes, and I haven't picked that up at all, although I would read it... Well now you've explained to me that they are traffic light colours, I mean it's you know fairly obvious that the red is the highest and the green the lowest"*

Participant 009, female, Store 1, aged 66-75 years, often label user, 'Think aloud' post-shop interview

"I mean certainly, I mean you asking me to do it as an exercise this afternoon made me more aware of it, but I mean the thing I find most useful is the medium, low, and I mean they've got… [the words...] *Yeah, high. So in fact that, allied with the colours, actually means the most to me and makes me more aware, or did make me more aware of what the content was* [Okay] *So it's words more than anything else I think… So when you're going round and you've got it in front of you, and if you had medium, low, high, then that would help inform my choice"*

Participant 023, male, Store 2, aged 46-55 years, occasional label user, Tobii post-shop interview

For a few participants, the opportunity to study the FOP nutrition information label in more detail during the interview resulted in an increased awareness of the nutritional content of a product and for one participant a change in product choice.

> *"I would only use them more probably if I was picking up a product that I didn't know* [Right so it's the first time you encounter a new product that you might actually use them] *Yes. Yeah I would have a look, yes, to see if my understanding of… do I think this product has a lot of sugar in, and, or something like that, because I can take a guess like I can with all of these sort of things, because I know there's a lot of sugar in those things, but it would only be new items really that I would tend to…* [To look for that?] *Yes, yes, yeah… I feel bad that I picked an item that's got a red…* [You shouldn't feel bad, you shouldn't feel bad. We all do don't we?] *I know. Well it's taught me a lesson"*
>
> Participant 010, female, Store 1, aged 46-55 years, occasional label user, Autographer post-shop interview

> *"I've eaten these and they're quite tasty, and it's got yoghurt in it so it's quite sort of, it feels reasonably healthy even if actually this tells you that it isn't. Does it tell you that? I don't know… It's 311 calories, that's quite a lot isn't it for one little bowl of something. Although if it's quite, it's a breakfast thing, it's designed isn't it for people who have breakfast on the run you know. It's quite filling actually. That's quite a lot of sugar isn't it? That's a lot of sugar, oh, isn't it. That's an awful lot of sugar… it's put me off now"*
>
> Participant 013, female, Store 1, aged 56-65 years, occasional label user, 'Think aloud' post-shop interview

> *"And I went back for the red pesto because I forgot it* […so again talk me through that one] *So these are all the pestos. I wanted a red one, these ones were two or three times the price of the one I bought in the end, although it's a tomato-ey one, and I'd rather have had… We normally have like a red pepper one or something slightly more interesting* [Okay so that was the price rather than…] *Yes. Although you did make me think. It says it's got cheeses in it, which I didn't know. It did make me go, this is probably full of fat, but it's absolutely delicious. So I bought it anyway. I thought let's not read the label, and then I don't know!"*
>
> Participant 028, female, Store 2, aged 26-35 years, rarely label user, Autographer post-shop interview

> *"*[you actually changed your choice based on us prompting you to use labels] *I think it's something that I would look at, but with that fresh in my mind, it was kind of like, it can be either but why should it be the cottage pie when it could be the shepherd's pie, given that kind of reminder so, yeah"*
>
> Participant 017, female, Store 1, aged 26-35 years, often label user, Autographer post-shop interview

6.6 Summary

This chapter has presented data relating to the participants' observed and declared use or non-use of the FOP nutrition information panel during a routine shop. The data suggest that some participants are using the information provided on the FOP nutrition panel sometimes and in some circumstances, but most participants did not actively attend to this labelling as they made their product choices, even when asked to do so.

Although some participants appeared to agree that the FOP nutrition information panel could play a useful part in helping to facilitate healthier food choices, many participants seemed to rely on their existing diet and nutrition knowledge and their belief that they already consumed a healthy diet, even though several participants misjudged the healthiness of specific product choices and others acknowledged that they were unsure of nutrition benchmarks and dietary recommendations.

Although some shoppers described using elements of the FOP nutrition information panel label as straightforward, a few struggled to make sense of traffic light colours and gram figures, several misunderstood more complex concepts like % RI figures and a few were confused about how to interpret the portion size information. Focusing on specific nutrients within the panel, most participants described being more interested in the fat and saturated fat information compared with the sugar, salt and energy information provided.

Many participants reported themselves to be confident in their use of the FOP nutrition information panel, despite making errors when it was used and with limited observation of its actual use in store. Several participants reported feeling more confident in their understanding of the use of the FOP nutrition information panel having taken part in the study, following detailed discussion with researchers. This suggests that the existence of a FOP nutrition information panel on pack is likely to be insufficient to trigger its use amongst most shoppers. Intervening to increase awareness and understanding may encourage some consumers to change their product choice towards a healthier option,

but the data also suggest that other competing (and potentially contradictory) influences, including those outlined in Chapter 5, frequently appear to outweigh considerations of nutrition and health.

In the following chapter, I consider the different methods used for data collection in this study in order to assess their usefulness as research tools in prompting and assisting participants to recall and articulate their use of the FOP nutrition information panel during their routine shop.

7. FINDINGS: COMPARING WEARABLE CAMERAS AND 'THINK ALOUD' METHODS – A QUALITATIVE ASSESSMENT OF DIFFERENT DATA CAPTURE METHODS

7.1 Overview

This chapter addresses the final thesis research question:

> As a research tool, how useful are wearable cameras (a novel data collection method) in prompting and assisting participants to recall and articulate their use of the FOP nutrition information panel during routine supermarket shopping compared with a traditional 'Think aloud' data collection method?

I present findings from analyses which explore the nature of the data gathered via the different methods of data capture used in the study. The data sources included in these analyses were separated into the following categories:

- transcribed audio 'shopping' data from the participants who took part in the 'Think aloud' process
- transcribed audio data from the post-shop interviews from the 'Think aloud' participants
- transcribed audio data from the post-shop interview from the participants who wore either the Autographer or the Tobii eye-tracking glasses during their shop, referred to as the 'camera-wearing' participants
- image data from both types of wearable camera

The analyses examine the acceptability of the different data collection methods to participants and researchers. I then focus on exploring the nature of the data generated from participants during the 'Think aloud' shopping process, the post-shop interviews and, for the 'camera-wearing' participants, in response to viewing images of their shop. The consistency of application of prompts used by researchers across the different methods of

data capture is also investigated. Finally, I summarise the relative contribution made by the different methods of data collection in generating data themes.

7.2 The acceptability of the different data collection methods

Most participants held a positive view about whichever method of data capture they had experienced suggesting that participants found each method an acceptable means by which to gather data in this setting.

Commonly, the 'Think aloud' participants said they enjoyed taking part, with only one participant appearing to feel self-conscious and another voicing some concern about her own performance.

> *"When I got back I said to [name of another participant] 'Have you read it properly? You've got to sort of think aloud'. He said 'Yeah' he said 'well you won't have any problem, you're always doing that anyway!'"*
>
> Participant 015, female, Store 1, aged 46-55 years, 'Think aloud' post-shop interview
>
> *"Oh, it's fun!"*
>
> Participant 022, female, Store 1, aged 46-55 years, 'Think aloud' post-shop interview
>
> *"Yeah, it's slightly weird, I feel like I'm talking to myself a bit but yeah… I might just do that when I'm shopping anyway, I don't know, I probably do just talk to myself"*
>
> Participant 001, female, Store 1, aged 36-45 years, 'Think aloud' post-shop interview
>
> *"I enjoyed it! I hope I was alright…I've sort of brought you into my family!"*
>
> Participant 008, female, Store 1, aged 66-75 years, 'Think aloud' post-shop interview

Similarly, participants who wore the Autographer talked of a positive experience with only a few appearing to be conscious of the camera. None of these participants reported being aware that the presence of the camera had changed their behaviour.

> *"I forgot all about it"*
>
> Participant 007, female, Store 1, aged 36-45 years, Autographer post-shop interview

"I didn't even know it was there really. It felt like when you wear your lanyard at work with a thing on it, it felt just like that"

Participant 016, female, Store 1, aged 36-45 years, Autographer post-shop interview

"You didn't feel like you were having to sort of like be really careful or anything, you just sort of went about your business"

Participant 006, female, Store 1, aged 46-55 years, Autographer post-shop interview

"No I didn't let that bother me, no… I decided not to look really good and buy all healthy stuff. I thought I'm going to get exactly what I would have got if I hadn't got the camera on"

Participant 019, female, Store 1, aged 46-55 years, Autographer post-shop interview

"I think I put things in front of the camera a little bit whereas normally I'd probably be up here or something [so you were a bit more conscious of the camera?] *Yeah, yes [Did that get easier?] Yes it did, yeah, yeah"*

Participant 002, female, Store 1, aged 46-55 years, Autographer post-shop interview

"I was just worried it was going to take pictures up my nose [I must remind people that it only takes pictures out this way…] *I did wonder, kind of being of ample chest whether it would be higher up and therefore…"*

Participant 017, female, Store 1, aged 26-35 years, Autographer post-shop interview

"I mean I only worried about I could say the position of the camera, not who has the camera on the wrong side, yes. But I would say comfortable by wearing the camera, yes"

Participant 029, female, Store 2, aged 36-45 years, Autographer post-shop interview

Participants who wore the Tobii eye-tracking glasses also reported positive views of their experience with them, despite some initial self-consciousness and a few technical difficulties during their use.

"They were fine. I mean I was vaguely hoping I wasn't going to bump into anyone I knew but as to that it was, no it's fine. I mean I wasn't particularly aware of them after the first minute or two"

Participant 020, female, Store 2, aged 46-55 years, Tobii post-shop interview

"It was fine, yeah absolutely fine. I'm quite used to using technology anyway, and recording devices and stuff, so but no the user glasses they were very comfortable, they didn't restrict my vision at all. I got the odd look when I was going round but hey I'm used to that… oh yes, that's when the back of the, your camera [recording unit] came off, yeah [Did you just notice that it had come adrift?] *No it actually fell off, so it was dangling down by the side of my leg"*

Participant 023, male, Store 2, aged 46-55 years, Tobii post-shop interview

> *"*[Bothered?] *Not at all, but it would have five years ago, but not now* [so what's different?] *because I'm quite a self-conscious person, I used to care what people thought of me, but I think as you get older it doesn't worry you. It doesn't worry me, no. I was dressed up as Spongebob yesterday, all day! I forgot I had them on towards the end"*
>
> Participant 026, female, Store 2, aged 26-35 years, Tobii post-shop interview
>
> *"It was okay actually, I think because I wear glasses anyway it didn't seem that strange really* [You didn't get too many funny looks…] *No, there's not that many people in the store. Though I think the poor chap who I did ask about the cherries, I don't know if he knew what I was doing, because I think he must have thought I was doing secret shopper for [name of participating store] or something, so he was very helpful!"*
>
> Participant 027, female, Store 2, aged 46-55 years, Tobii post-shop interview

For the study team, collecting data by the 'Think aloud' method and the Autographer were straightforward. The Tobii eye-tracking glasses were more difficult to use in practice – participants who routinely wore glasses to shop could not be assigned to this method of data capture, the glasses took longer to set up and calibrate for each participant and on several occasions during testing data was lost because the equipment failed. This resulted in fewer participants than originally planned being allocated the Tobii eye-tracking glasses, so data from the two different methods using images were analysed separately and also in combination.

7.3 The nature of the data generated according to the different data capture methods used

Figure 7.1 – 7.3 show the key themes found within the data captured by the different data collection methods. These were the 'Think aloud' shopping process (themes shown in Figure 7.1), the post-shop interviews for the 'Think aloud' participants (themes shown in Figure 7.2) and the post-shop interviews for the 'camera-wearing' participants who wore either type of wearable camera (themes shown in Figure 7.3).

7.3.1 Factors which influence purchasing decisions

Each of the main themes which were said to influence participants as they were making purchasing decisions during their routine shopping (previously described in Chapter 5) were found in data generated across all data capture methods. As shown in the illustrative quotations below, the participants appeared able to provide a detailed commentary about these factors during their shop or as they took part in the post-shop interview.

> *"So now yoghurt is ordinary vegetarian, but I always hope that my son, who's vegetarian, and the children will have an Alpro, which is a dairy-free voghurt. So we'll have that. But I don't push it on them, because you mustn't. I'm a firm believer that children must be shown the options and make up their own minds. And I did that with my children. They knew that my husband ate meat and I didn't and we both told them why and they experimented and they eventually both went vegetarian. And my daughter actually followed me and is vegan. But they made up their own minds"*
>
> Participant 008, female, Store 1, aged 66-75 years, occasional label user, 'Think aloud' shop

> *"Yeah vegetables, the vegetables section yes. So then I was looking through the section and then I said okay I've got carrots stored in the fridge, so much better to, I'd say to boil the carrots for the evening before buying something else fresh tomorrow probably, because I'll be in [name of town] then. And, yeah, that was my reason. So I didn't pick up anything else"*
>
> Participant 029, female, Store 2, aged 36-45 years, occasional label user, Autographer post-shop interview

> *"Right, three spuds for jackets. They've got bags of jackets but I can't really afford it. I just get… ah, there's some jackets. Oh! They're nice…right, supposed to be jackets. Cheap [name of participating store] butter – I haven't got there yet. Two large onions. Where are the onions? Maybe around here. And they've got coconuts. I'd love a coconut but I can't really afford it. Where's the onions? I can't find any onions"*
>
> Participant 014, male, Store 1, aged 46-55 years, always label user, 'Think aloud' shop

> *"Yeah, my mussels. They were £1.79 I believe. It is a bit expensive but I mean that's my week's treat. I love chocolate but I don't eat it very often because I try to keep an eye on my weight. But the mussels, yeah, I'll eat them all in one go, and luckily my partner doesn't like them so I can have the whole pack to myself. Not that there's a lot in there when you get rid of the shells but yeah I'm so glad they've got them back in. I don't know if it was because I mentioned it to the young lad that was assisting here, or… because I know they weren't in for a while, even my sister said so, so, yeah, well pleased. I can't wait! I'm getting hungry looking at them!"*
>
> Participant 015, female, Store 1, aged 46-55 years, 'Think aloud' post-shop interview

"[You look like you were still looking at the cake mixes here] *Yeah, looking at Madeira, we looked to see about Madeira cake, but we didn't get it. Daddy prefers Devil's cake doesn't he?* [What are you looking at on here?] *What you need to make the cake, if you need eggs, or how simple it is* [Okay so you're looking at what you need to add to that mix to make it. Okay] *So we didn't get it. We don't need it yet"*

Participant 026, female, Store 2, aged 26-35 years, often label user, Tobii post-shop interview

"Ham for sandwiches in the week. The date's fine, and I know I can keep it in the fridge for, you know until the 5th November. We all eat ham. It's British again, and it comes in handy for the sandwiches"

Participant 002, female, Store 1, aged 46-55 years, occasional label user, Autographer post-shop interview

7.3.2 Health, nutrition-related health and the FOP nutrition information panel

Table 7.1 compares the nature of the data generated across data collection methods, as they relate specifically to the other key themes found in the data.

i) Health and nutrition-related health themes

Most of the 'Think aloud' participants (whether asked to use the FOP nutrition information panel prior to their shop or not) mentioned health or nutrition-related health during their shop, suggesting that these issues were being considered as participants decided what product to select. However, as shown in the illustrative quotations in Table 7.1, the comments made were often a simple statement with no further elaboration. During the post-shop interviews, the 'Think aloud' participants and the 'camera-wearing' participants also referred to issues about health and nutrition-related health. In these instances, the commentary provided became more expansive following prompts during the interview.

ii) Nutrition labelling and the FOP nutrition information panel

None of the 'Think aloud' shoppers who undertook a 'Routine' shop (so were not asked to use the FOP nutrition information panel during their shop) made any spontaneous reference to the FOP nutrition information panel whilst they were shopping. Nutrition labelling was raised as an issue by only one of these participants, who mentioned (and

dismissed) a nutrition claim label. Amongst the 'Routine+FOP' shoppers (who were asked to use the FOP nutrition information panel during their shop) limited use of any nutrition labelling was observed during the 'Think aloud' shop. Only one shopper was observed using the FOP nutrition information panel several times during her decision-making while another participant referred to the BOP nutrition information once during her shop. Another 'Routine+FOP' shopper only looked at the FOP nutrition information panel during a specific interaction with the researcher as she was shopping. This intervention went beyond the general request required by the protocol, involved a series of questions and statements from the researcher (shown in Table 7.1, participant 025) and was, in effect, a mini-interview during the 'Think aloud' shop. Data themes generated from this mini-interview intervention (shown in darker purple on Figure 7.1) appear to represent a broader range of nutrition specific information than other data suggest may have been elicited if only a general prompt had been used by the researcher.

In response to prompts during the interview, a wider range and more detailed and specific information about the use of the FOP nutrition information panel was generated during the 'Think aloud' post-shop interview compared with the depth of data gathered from the same participants during the 'Think aloud' shopping process. These additional themes (shown in Figure 7.2 in darker purple) related to reasons for use or non-use of the FOP nutrition information panel, traffic light colours and descriptors, different formats of label, consumer trust in the nutritional information provided, confidence in use and the impact of the FOP nutrition information panel on purchasing decisions.

None of the 'camera-wearing' participants who did a 'Routine' shop referred to the FOP nutrition information panel during their post-shop interview until they were prompted to discuss it by the researcher. Amongst the 'camera-wearing' participants who did a 'Routine+FOP' shop, spontaneous reference to the FOP nutrition information panel was also uncommon. All of the 'camera-wearing' participants spoke more expansively and with more explanation about the panel following prompts from the researcher during the post-

shop interview. These data were of a similar range and type of information to that generated during the ‘Think aloud’ post-shop interview, with the exception of a new theme about the location of use of the FOP nutrition information panel (shown in darker purple on Figure 7.3).

The most wide-ranging and in-depth information, particularly in relation to the FOP nutrition information panel, was generated during the post-shop interviews. The data generated from the ‘Think aloud’ shopping process alone generated largely brief and descriptive information from participants. Without data gathered from the post-shop interviews with these participants, very little information about their understanding and use of the FOP nutrition information panel would have been elicited from the ‘Think aloud’ participants. This might suggest that the time spent during the interview - perhaps using specific prompts to help participants to further explore their thoughts and to reflect on their recent shopping experience - is a useful means by which to gather a detailed explanation of the factors that participants describe as important influencers on their purchasing decisions, particularly in relation to the FOP nutrition information panel.

The remaining analyses in this chapter explore the impact of the different prompts used by the researchers during the post-shop interview.

Table 7.1: Examples of data generated by the different data gathering methods

	'Think aloud' shopping data	'Think aloud' interview data	Image interview data
Health or nutrition-related health theme	*"I've got pasta on the list. I don't know if they've got any wholewheat"* Participant 001, female, Store 1, aged 36-45 years, occasional label user *"I do my best to keep my husband healthy…"* Participant 008, female, Store 1, aged 66-75 years, occasional label user *"It's not going to be a particularly healthy shop I don't think but never mind"* Participant 011, male, Store 1, aged 26-35 years, often label user *"Right, what are we having today? No, stir fry's ready. Do we don't have a… no, because the next day I'm doing a fry-up, very unhealthy fry up"* Participant 015, female, Store 1, aged 46-55 years, rarely label user *"Rindless back, I'll get those, which doesn't have too much fat on it"* Participant 021, female, Store 1, aged 66-75 years, often label user *"So I actually need something that's not too calorific, fairly healthy. And the trouble is I prefer white bread which I know isn't healthy, but there we go"* Participant 024, female, Store 2, aged 66-75 years, occasional label user	*"Again, because it is quite healthy, I don't mind you have all butter croissants, they're more tasty than low fat croissants. Because we only have croissants maybe two times a week"* Participant 005, female, Store 1, aged 36-45 years, occasional label user, product prompt *"I do buy salmon regularly* [but I noticed when you picked up the salmon you did actually turn it over] *Oh did I?* [and have a look at the back, yes] *I wanted to see where it was from, it was in Scotland. I wasn't looking at the values, because I'm more or less, I wouldn't say familiar with the calorie content, or the energy or protein, but of course it's oily fish and I would buy it and I know it's good for me…"* Participant 009, female, Store 1, aged 66-75 years, often label user, product prompt	*"Yeah I was thinking about buying a pizza but then realised that my wife had bought one from [name of alternative supermarket], so I probably should eat that one first* [Okay so that was a looking but not a purchase because you know you'd already got one?] *Yeah pretty much. It wasn't anything really to… I suppose, yeah I don't think, I mean I don't see them as being particularly unhealthy. Maybe they are but, yeah. It's mostly because my wife's got one at home* [Okay] *But that's the sort of thing I would normally buy here. I'd normally pick up a pizza"* Participant 12, male, Store 1, aged 26-35 years, never/often label user, Autographer, image prompt *"*[So we know that you bought those, the houmous, because it was on offer] …*Yeah…* [Is there anything… You've told me already about the flavours that you bought those crisps ...] *Yeah I wanted something really plain* [Yeah, okay. But is there anything…] *I don't like stuff with loads and additives and stuff in. That's what I was looking for* [Oh okay, so when you say plain you don't mean plain flavour, you mean…] *Just very simple. Yeah, healthier.* [And how did you decide they were simple? Was it…] *Because generally if you buy them ready salted they're lower fat, they just have got all the MSG and additives in and things like that, like Monster Munch and stuff like that, so I didn't want that"* Participant 16, female, Store 1, aged 36-45 years, often label user, Autographer, product prompt

Table 7.1: Examples of data generated by the different data gathering methods

	'Think aloud' shopping data	'Think aloud' interview data	Image interview data
Nutrition labelling and FOP nutrition information panel theme	*"I mean I don't really care about fifty per cent less fat but so I'll just get the cheaper one"* Participant 005, female, Store 1, aged 36-45 years, occasional label user	*"Well you see, these things like that I honestly don't look at. I look at it now because, yes because you're here, and I can see it's high in sodium or whatever, but I wouldn't normally pay any attention to that whatsoever. I would frankly not bother to look at it* [Why would that be?] *Because I think I know a fair bit about nutrition I suppose, for good or for bad. And also because my daughter in particular is a picky eater I would quite often buy something, you know even if there was a row of reds there, if I thought that she ate it well, to be honest I'd buy it anyway"* Participant 022, female, Store 1, aged 46-55 years, rarely label user, product prompt	*"*[You said you wouldn't ordinarily look at them] *No, quite often, I mean I'm very aware of the traffic light scheme but to be honest it's not the colours that I was registering, it was the, sort of the words 'low'* [So it's the words rather than…] *Yeah words rather than colours* [So you wouldn't avoid any particular colours or anything like that ...] *No, not really. Well yeah maybe red, only because, yeah, red with associations of danger and being alert. But no it was certainly, I was looking at the words rather than the colours when I chose those. And the fact that that had reduced fat as an added in big on the front"* Participant 023, male, Store 2, aged 46-55 years, occasional label user, Tobii, product prompt
	"Now they say sugars, salt. I don't mind a little bit of salt on something because I never use salt in cooking, I never add it to anything, it's never on the table, so if there's a small amount I accept it" Participant 008, female, Store 1, aged 66-75 years, occasional label user	*"Yeah I think the first thing that sort of catches my eye I think is the red. So have a look and see that's sort of saturated fat* [But is it the colour, the first thing that you notice?] *I think it's the colour first of all and then probably the high next* [The words?] *The number of grams* [How about the grams?] *That doesn't immediately draw my attention I don't think. I mean when you look at it it's, the number of grams looks quite low in comparison with the, sort of the number of grams of ordinary fat and sugar, so it doesn't seem too bad in comparison. But I think it's just the colour and the high and the thirty-four per cent, which I think is the daily, percentage of daily intake as well. It seems quite high. And if that's just a single meal of the day then that's quite a lot to be sort of taking on in one meal* [Yeah. Anything else that's on the label there that you noticed?] *I think… I have only just noticed that it's got low in sugar as well, which is probably quite a good thing, and not really what I'd be expecting. If I saw something that's high fat I might also be expecting it to be high in sugar as well so that's quite a surprise, thinking about it. And then the other two are down as medium, so they don't sort of strike me as being out of the ordinary so much really. So it'd be more the saturates and the sugars I'd be looking out for I think"* Participant 011, male, Store 1, aged 26-35 years, often label user, product prompt	*"I suppose I would use them more if I was buying a product that I was unfamiliar with* [Okay] *Possibly, that was outside of my normal range of shopping I suppose, yeah. And actually I use them, I do use them on foreign food because sometimes you get them on foreign food where you're not absolutely sure what's in the food* [Okay] *You don't get them a lot in that but…* [Yeah, I suppose anything you're unfamiliar with or you're not sure about, it's because you're sure what's actually in it] *Yes* [And that's how you decide] *Yeah* [Okay. Other stuff you'd had routinely before, sounds like you'd use them a bit less for that] *Yes, and I'd only use them if I was comparing. If I was… if two things were very close together in price, then I might start looking at what the actual… how do they vary in terms of which has got more fat and more sugar in it* [Okay, so that might be a decision but it would come after price really] *Yeah"* Participant 027, female, Store 2, aged 46-55 years, often label user, Tobii, direct question prompt

Table 7.1: Examples of data generated by the different data gathering methods

	'Think aloud' shopping data	'Think aloud' interview data	Image interview data
	"The salt is good on that again. Calories are quite good. The fat's slightly high but it isn't batter, it's just breadcrumbs" Participant 024, female, Store 2, aged 66-75 years, occasional label user	*"I mean I think it's, on some of these it's a lot clearer… I don't, I haven't really looked at how their labels are different on different products much before but I guess they're clearer on there with the colours and stuff, whereas some of the other products are a bit harder to see and harder to sense. I mean because obviously this one should be quite red in terms of the level you'd have thought* [That's interesting isn't it, that it isn't red?] *Yeah. Yeah it isn't clearly red but I mean in my head I know, thinking about it, it's very cheesy so it's not, it's pastry so it's not that good for you at all. But yeah the colours do help"* Participant 001, female, Store 1, aged 36-45 years, occasional label user, direct question prompt	*"To me it's essential for something like that to be on the packet, and at least to be where one can pick it up and see it. Not pick it up and have to go through the ingredients...Keep them a decent size so that you can catch somebody's attention. Not just tiny wee squares...* [Yes these are quite a good size] *These are a good size, yeah. I like that, yeah. I do like that. So keep them a good size and have them at the front of the pack where everybody can see them. There's some you can hardly pick it up, you see the four reds, if they want they can put it down and pick up something else"* Participant 031, female, Store 2, aged 66-75 years, often label user, Autographer, direct question prompt
	"[And if I was going to prompt you to look at the label…] *Yeah I was going to look at that* [Let's have a look at what labelling there is. Whereabouts is it?] *Well we've got…* [Turn it some more, and you might find…] *So we've got calories, sugars, fat. I haven't noticed that before actually* [No? You haven't noticed it?] *No I haven't, no. So that's not really, it doesn't really mean a great deal to me actually* [It doesn't mean a great deal] *That saturated fat looks quite a lot actually, eleven…* [How can you tell it looks quite a lot?] *Well it says eleven per cent… That's compared to this - fat, six per cent. I suppose they're… I don't know what fat… And this is saturated fat - I don't know you know what the difference is really. So does that mean you know it's like seventeen per cent fat? I think after looking at that I might put it back and not buy biscuits altogether"* Participant 025, female, Store 2, aged 55-65 years, rarely label user, direct question	*"*[You talked a little bit about the other sorts of labels that you can see that don't have the traffic lights, so GDA labels and stuff] *I find that really fiddly*. [You don't find those easy to use?] *No*. [Do you use those at all?] *I suppose sometimes, but not a lot. And I find that the whole breakdown into daily nutrition, and often the things are measured against different units as you look through it, and so I finish up absolutely, I have no idea what it's talking about then* [What about these labels makes them easy to understand?] *Simply the colouring of the traffic lights…* [And when you look at these labels, is it only the colour that you use or do you look at the, for example the figures or the text or maybe because they do have GDA's on them?] *I don't find the figures helpful so much. Yes, I mean the fact that it says high - high, low, medium - yes then you notice that, and that goes with the colour. The actual amount in grams again means very little to me. Sometimes the percentages, that obviously means something there"* Participant 021, female, Store 1, aged 66-75 years, often label user, direct question prompt	*"*[You said you tried to avoid a lot of red but how do you make a decision if there's kind of a, there's not much in it?] *I don't know really. I think it would depend on what other meals I had planned for the week, and how kind of calorific I thought they were, but if I knew we were going out to eat or if there was a special occasion and there would be lots of food, where you know that's fine. Or say you know a really cheesy pizza that you know is highly calorific is okay if there's nothing else going on in the week, and I know that I've got some really good dinners. That type of thing* [Yes, so you'd weigh it up against planning what you're going to have] *Exactly, yeah. Or maybe I'd look at that and think actually maybe, okay this is convenient but I know that I can make this… Like say spaghetti bolognaise, I can make it probably with less calories, siphon off more of the fat, that type of stuff, and do it myself* [So how often would you make that choice would you say?] *Probably once a week on something. I would look at a ready meal and think oh actually I know that I've got mince in the fridge so, in the freezer, and there's no point in getting that for say two pounds when I know I've got mince already"* Participant 017, female, Store 1, aged 26-35 years, often label user, Autographer, direct question prompt

Table 7.1: Examples of data generated by the different data gathering methods

	'Think aloud' shopping data	'Think aloud' interview data	Image interview data
		"I suppose if I plumb into my soul, I actually think that food manufacturers and retailers should not be selling things that are… I think they should be, I think it should be… Maybe this is a bit utopian - I actually think you should be able to come into a shop and buy things that are not going to kill you, you know? I don't think you should go to a shelf and buy something that looks wholesome, and actually isn't. I find that very depressing actually, quite duplicitous and quite depressing. So I do think that food manufacturers have got the responsibility. And I think it must be very very difficult, if you're a young mum with a big family and you're trying to work on a budget, actually it must be an absolute nightmare to to… It's okay if you've got time and you know how to cook, and you can come and buy your big bags of rice and your big bags of potatoes and all those sorts of things, then fine, but if you're not somebody that feels confident in that area and you are relying on packaged things, actually it needs to be much more straightforward doesn't it?" Participant 013, female, Store 1, aged 56-65 years, occasional label user, direct question prompt	*"I mean I would just highlight again this, it's reminded me to do it again, but I have got caught out several times with this business of the servings, and actually it's all very clever and obviously it's designed to try and make the thing look much healthier, but I'm always amazed at how small the servings of anything are, according to…* [They're not real life servings at all?] *Well if I was an elderly small lady of eighty maybe, but not for anybody who's active, no* [And so your daughter would eat one of these without any bother?] *Oh, probably while she was waiting for something else, yes"* Participant 020, female, Store 2, aged 46-55 years, often label user, Tobii, direct question prompt
			"Trying to think what I was looking at the other day. I was trying to work out something from these, and one of them, I think it was pasta, they had that per two hundred grams cooked weight, and this one was per hundred grams uncooked weight, and you couldn't, couldn't compare the two. I think what I was looking at, you know I can't remember now what I wanted to know, but it was, yeah, you need to be able to compare them. [So you did look at them, was that at home?] *Yeah I did at home, that was at home, yeah* [So you're mulling it over when you get home, when you've got the time] *Yeah, how much of it to cook for each of us, yeah"* Participant 007, female, Store 1, aged 36045 years, rarely label user, Autographer, direct question prompt

Figure 7.1: Key themes generated from 'Think aloud' shopping data

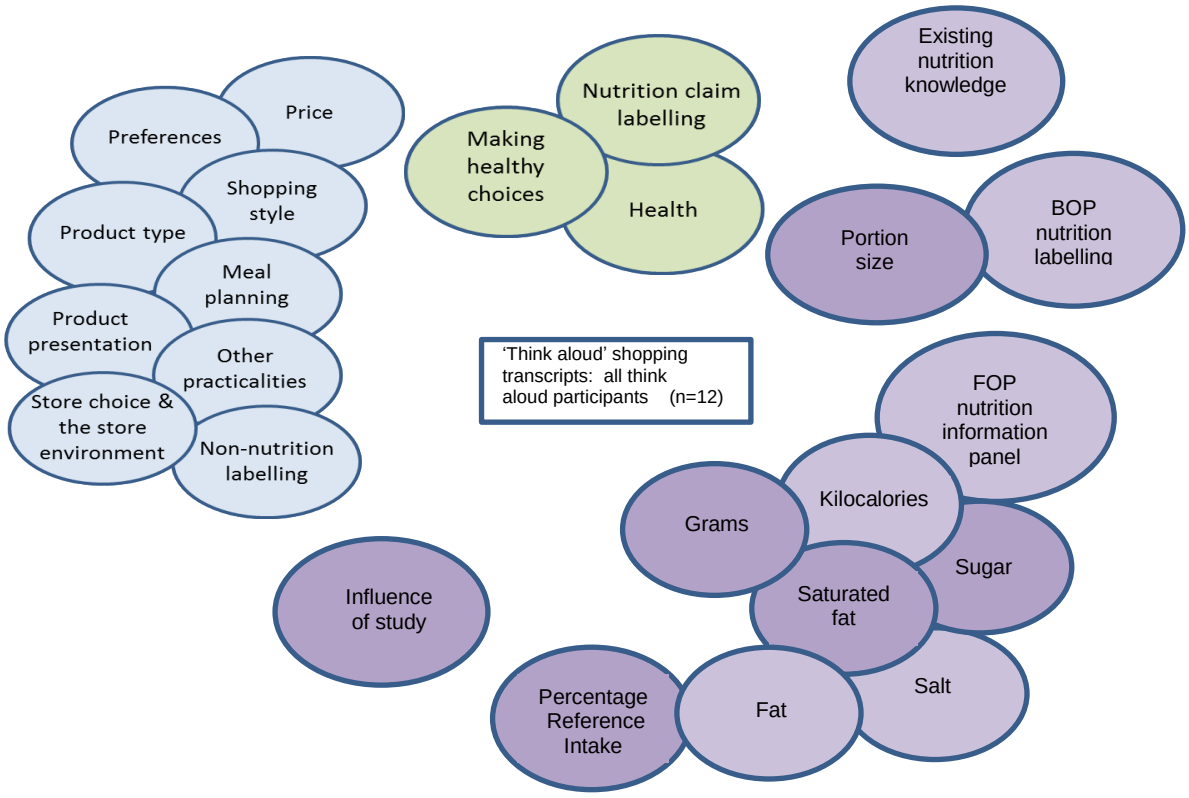
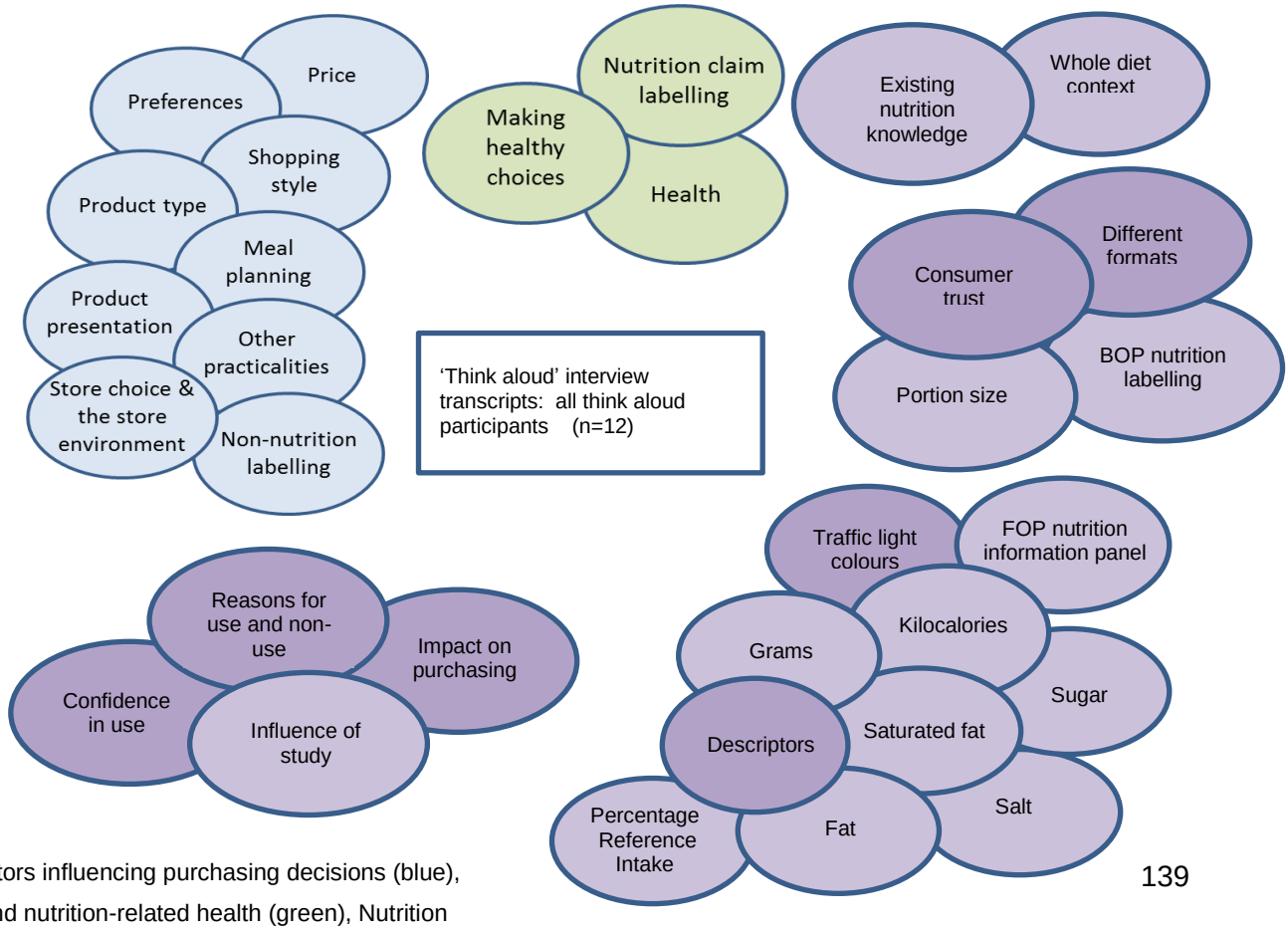
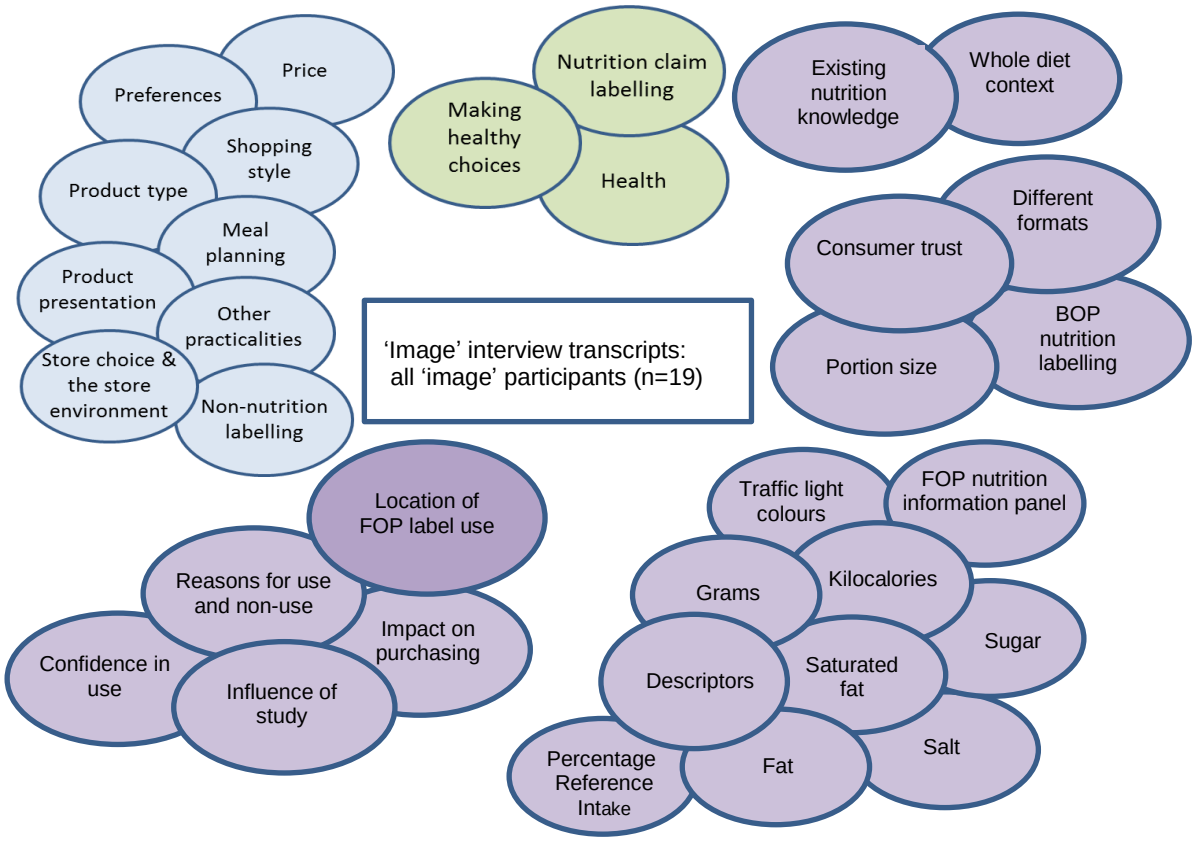


Figure 7.2: Key themes generated from 'Think aloud' post-shop interview data



Key: Factors influencing purchasing decisions (blue), Health and nutrition-related health (green), Nutrition labelling and FOP nutrition information panel (purple)

Figure 7.3: Key themes generated from 'Image' post-shop interview data



Key: Factors influencing purchasing decisions (blue), Health and nutrition-related health (green), Nutrition labelling and FOP nutrition information panel (purple)

7.4 The impact of the different prompts used by the researchers during the post-shop interview

Three different types of prompts were used by the researchers during the post-shop interview – image prompts (for those participants who wore either type of camera), product prompts (either products mentioned by 'Think aloud' participants during their shop or products introduced by the researchers during the post-shop interview) and direct questions, informed by the semi-structured interview schedule. Firstly, an analysis of the image data alone is presented. This is followed by an analysis which assesses which type of prompt used during the post shop interview elicited specific data themes.

7.4.1 Image data

i) Autographer image data

This analysis is based on images collected by twenty participants who wore the Autographer wearable camera during the study. For fourteen participants, this camera was the primary source of data capture during their shop. In addition, two participants took part in the 'Think aloud' process and also wore an Autographer and four participants who wore the Tobii eye-tracking glasses also wore an Autographer. These six participants did not view their Autographer images during the post-shop interview.

According to the data captured by the Autographer cameras, the time spent by participants to complete their shop ranged from 6-40 minutes.

Data were successfully gathered from the participants who wore the Autographer, with the average frequency of image capture calculated as every 13-14 seconds. There was some loss due to unusable images (blurred or unclear), ranging from 2-15% of total images for all but one participant. Unusable data from this participant (whose primary data capture tool was the Tobii eye-tracker glasses) was 53% because the camera was obscured by her clothing. Non-food images (which ranged between 1-35% of total number of Autographer images) were excluded from further analysis.

Between 10-63% of the total number of images captured by participants were coded as 'walk though' images, where participants were walking in the aisles and/or moving around the store. Although it is possible to ascertain the location of the participant in the store from these images, they offer little further practical purpose to address the research question of this study. Similarly, between 2-22% of the total number of images captured by participants during their shop were coded as 'facing shelf/single shot' images. These images suggest the participant demonstrated some specific interest in this part of the store display but little further can be surmised from these data, apart from on a few

occasions (4 only across all participants) when a single image shows a product being picked or held.

The images which could be used for further analysis were those images coded as ‘browsing’ or ‘choosing’ images. These ‘episodes’ were defined as a series of 2 or more consecutive images where the participant was facing the display shelves. Images were coded as a ‘browsing’ episode when no obvious image of a product being handled was captured and a ‘choosing’ episode when an image within this episode captured the participant with a product in their hand. The number of browsing or choosing images as a percentage of the total number of Autographer images captured ranged across participants from 7-71%, with the number of these episodes ranging from 1-15 episodes.

Table 7.2 provides a description of the browsing and/or choosing episodes, and some illustrative examples of the associated images, captured by participants who wore the Autographer camera.

Autographer images - when viewed in isolation from the other data sources used in this study - do appear to provide a useful mechanism to identify episodes of browsing/choosing. Sometimes, however, items which appear to have been selected for purchase during a shop (for example, the cheese in the trolley of Participant 002 in the image below) were not captured in previous image data, suggesting episodes may have been missed.

"and I think in that cabinet as well they have again reduced cold meats and things, so I was looking to see if there was anything worth having [Right, so doing a bit of browsing...] *Yeah, yeah* [Oh, what's that?] *That's cheese from that same said cabinet. It was reduced and it's Somerset Brie, so I can use it chopped up in, with salads, to take to work for lunch* [So you take your own lunch usually?] *Yeah, yeah, oh yeah, virtually the whole time, yeah, yeah. And my daughter, she has packed lunch as well, so…* [There's lots of juggling going on isn't there…] *It is, yes* [About what you're doing for dinner and what you're making for things ahead…] *Yeah, yeah, as well. As I say, I don't think of nutrition at all, to be honest. I tend to think that I'm like healthy-ish, at picking things up.* [So, you think you're being guided by what you know generally…] *I think I'm being guided by what I know generally, and as I say it was a local Somerset Brie cheese. I hate things going to waste so it's something I can use"*

Participant 002, female, Store 1, aged 46-55 years, occasional label user, Autographer post-shop interview

Understanding what the images capture is not always straightforward, potentially leading to coding errors. For example, as shown below, sometimes it is not possible to identify a product within an image.

"So now I've found the crisps. What I was actually thinking of buying were just plain tortilla ones actually. I went back there because I didn't go round there. And then I was right, I went right back to where I thought the bread was and I could see some crisps on top of the shelf. And then I thought ah it is down there, so went back there [Oh there you are, and here you actually find them, so you were looking for some tortilla ones] *Some plain tortilla triangle ones, like they sell in [name of alternative supermarket], but they seem to have more like the flavoured ones, so I was just having a look. We don't really eat crisps but we're having some people round on the weekend and I only buy them like at Christmas or something like that. So I was just wanted something plain that we could use for dips and stuff"*

Participant 016, female, Store 1, aged 36-25 years, often label user, Autographer post-shop interview

In addition, it is not always clear from the images which make up an episode whether or not a product which is being handled is actually chosen for purchase.

"Okay, well what I do before I come into the [name of participating supermarket] is look at their special offers for the week [Ah!] *And they had a special offer on a joint of gammon, which unfortunately they were out of stock on, so we thought we'd get bacon instead, because [name of son] likes bacon* [Okay.] *And the first bacon I picked up was the cheapest, but it was Danish bacon, and I'm conscious of the fact that British pigs are happier pigs, so we went for the British bacon"*

Participant 003, female, Store 1, aged 36-45 years, never label user, Autographer post-shop interview

Images can appear to suggest that a comparison between products is taking place but it is not possible to verify this from the images alone. Similarly, as shown in the two examples shown below, the images alone do not provide sufficient clarity to establish whether or not a participant is attending to the FOP nutrition information panel or provide any insight into the rationale for product selection.

"[Oh now, oh right what's happening here?] *That's the lasagne. My, we all like lasagne. I tend to buy pre-packed things if we're always going to be out early evening or if I'm not in it's something my husband can shove in the oven for dinner, and we do like them. My daughter is to-ing and fro-ing between us and another house so if she's coming home late and I can't keep a meal cooked for her that amount of time then lasagne and pre-packed things comes in handy, so… I'm not looking at the nutrition at all am I?* [Oh that's doesn't matter. It's interesting to see what else...] *It's British though* [So that's quite important?] *It is, yes, yeah [But you bought two of those didn't you?] Yeah they're two for four pounds so it makes sense yeah* [But would you have bought this if it hadn't been on offer do you think?] *I probably would have just bought one, and I would get more maybe in my regular Saturday shop when I've got the car and I can carry it* [Sure, so trying to carry it all home is not easy is it…] *Yeah, yeah* [Well there you are, with both of them in your hand] *Yes"*

Participant 002, female, Store 1, aged 46-55 years, occasional label user, Autographer post-shop interview

"So houmous is on the list. I very very often have houmous for my lunch, and the other people in my household eat it as well. So I was… They've changed the packaging, so there's about eight pictures I imagine of this, because I was like where the heck is the normal houmous [Let's have a look and see. Ah, there are, so you're here a while then] *Yeah, because I couldn't find the one I wanted* [But you clearly did find it in the end] *Ah ha!* [And there it is. Now in fact this is the one that I've got here as an example isn't it?] *It's not, because you made me look at the things, and I went this is less than half the fat of that. And although I don't think I like reduced fat houmous, I thought I would try it, seeing as how you'd asked me to look at the numbers, and it is less than half the amount* [So you were looking at the labels?] *Yes* [We'll come back to that in a minute ...] *You can see he's red and he's not"*

Participant 028, female. Store 2, aged 26-35 years, rarely label user, Autographer post-shop interview

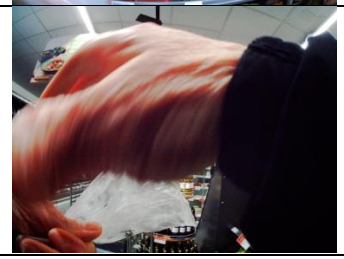
Assessing the images in conjunction with information provided during the post-shop interview appears to elicit a clearer understanding of these participants' decisions around product purchases.

Table 7.2: Browsing and choosing episodes captured by participants wearing the Autographer camera

Participant	Total number of Autographer images	Number of 'browsing' images	Number of 'choosing' images	Browsing/ choosing images as % of total Autographer image data	Number of episodes	Episode description	Example of Autographer image episode
002	74	8	24	43%	14	Browsing: fruit, vegetables, fat spreads, bakery, Choosing: Mince in trolley, salmon in hand, lasagne in hand/trolley, ham in trolley, bread in trolley, 2nd bread in trolley, different chocolates in trolley, cereal in hand, crisps in hand, **cheese biscuits in hand** Missed: cheese in trolley, chocolate in trolley	
003	56	16	24	71%	6	Browsing: fruit, vegetables, chocolate Choosing: meat in hand, **bacon in hand**, bread in hand	
004	149	39	22	41%	14	Browsing: Vegetables, rice and pasta, pulses, cereals, Quorn, baby milk, chocolate, biscuits, condiments Choosing: Cheese in hand, peas in hand, Puy lentils in hand, tins in hand, **Colman's mix in hand** Missed: Milk in hand, eggs in hand, oats in shot	

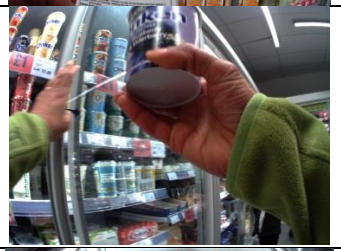
Key: The bold text indicates the episode description which is shown in the associated image.

Table 7.2: Browsing and choosing episodes captured by participants wearing the Autographer camera

Participant	Total number of Autographer images	Number of 'browsing' images	Number of 'choosing' images	Browsing/ choosing images as % of total Autographer image data	Number of episodes	Episode description	Example of Autographer image episode
006	60	19	2	35%	5	Browsing: Fruit and vegetables, yoghurt, pasties, ice cream/frozen puddings Choosing: **Ham in hand**	
007	55	15	19	62%	9	Browsing: Meat, yoghurt, bakery, tea, frozen goods Choosing: Vegetables, sweets in hand, **product in hand - crisps?**, fruit or veg product in hand	
010	31	7	6	42%	3	Browsing: Bakery, cereals Choosing: **bag in hand in fruit and veg**	

Key: The bold text indicates the episode description which is shown in the associated image.

Table 7.2: Browsing and choosing episodes captured by participants wearing the Autographer camera

Participant	Total number of Autographer images	Number of 'browsing' images	Number of 'choosing' images	Browsing/ choosing images as % of total Autographer image data	Number of episodes	Episode description	Example of Autographer image episode
012	47	17	6	49%	7	Browsing: Fruit, ready meals, cheese, cereals, pot noodles Choosing: **fruit juice**, milk	
016	41	2	1	7%	2	Choosing: **Yoghurt in hand**, packet in hand (frozen chips?)	
017	40	2	9	27%	2	Browsing: Meat Choosing: **Ready meals (fridge open)**	

Key: The bold text indicates the episode description which is shown in the associated image.

Table 7.2: Browsing and choosing episodes captured by participants wearing the Autographer camera

Participant	Total number of Autographer images	Number of 'browsing' images	Number of 'choosing' images	Browsing/ choosing images as % of total Autographer image data	Number of episodes	Episode description	Example of Autographer image episode
018 (Tobii)	34	4	0	12%	1	Can't tell what but in same location	
019	37	9	0	24%	2	Browsing: Fruit and vegetables, **bread**	
020 (Tobii)	44	9	4	29%	5	Browsing: Fat spreads, bread, tinned meat/fish Choosing: Bananas in hand, rice in hand	
021 (TA)	87	21	29	57%	15	Browsing: Fruit, meat, bacon, puddings, crisps Choosing: (Gammon in hand, **picking up lamb shank,** another packet in hand – curry?) picked up in same episode, cheese in hand, eggs in hand, bread? in hand, Cup a soup packet picked off shelf, pasta taken from shelf, beans in hand, olives in hand, reaching for biscuits, packet in hand	
022 (TA)	84	46	5	61%	11	Browsing: Bargain bin, sandwiches, meat, cheese, bargain fridge, tinned veg, bakery, frozen, fizzy drinks, bin end Choosing: **Vegetables in hand**	

Key: The bold text indicates the episode description which is shown in the associated image.

Table 7.2: Browsing and choosing episodes captured by participants wearing the Autographer camera

Participant	Total number of Autographer images	Number of 'browsing' images	Number of 'choosing' images	Browsing/ choosing images as % of total Autographer image data	Number of episodes	Episode description	Example of Autographer image episode
023 (Tobii)	50	25	0	50%	8	Browsing: Cooked meats, vegetables, dips, bread, jam, tinned vegetables, squash, cereal	
027 (Tobii)	97	33	14	48%	13	Browsing: Fruit, yoghurt, cheese, mayonnaise, pasta/sauces, **Chinese ingredients**, cereals, dried fruit, meat Choosing: Peas, sausages/seafood (picks up mussels), picks up meat packet, fruit in hand	

Key: The bold text indicates the episode description which is shown in the associated image.

ii) Tobii image data

Five participants wore the Tobii eye-tracking glasses during the study. According to the data captured by the Tobii eye-tracking glasses, the time spent by participants to complete their shop ranged from 7-20 minutes.

Data were successfully gathered from all of the participants who wore the Tobii eye-tracking glasses. Non-food images (which ranged between 5-15% of total time of image capture) were excluded from further analysis. Between 22-40% of the total image time captured by participants was coded as 'walk though/glancing' images, where participants were walking in the aisles, were moving around the store or were scanning the display shelves without appearing to hold their gaze. No further analysis was undertaken on these data.

As it is not possible to determine from image data at which exact point an episode of 'browsing' turns into a 'choosing' episode, browsing and choosing time was combined into a single episode for this analysis. Table 7.3 categorises the browsing/choosing episodes captured by participants who wore the Tobii eye-tracking glasses. The length of browsing/choosing time as a percentage of the total shop time, as captured by the Tobii eye-tracking images, ranged across participants from 46-70% with the number of episodes ranging from 6-24 episodes. The amount of time spent appearing to attend to the FOP nutrition information panel during this time ranged from 0.5-2%.

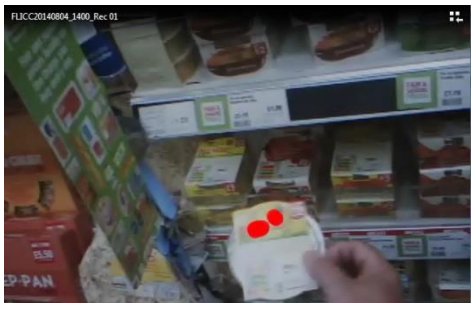
Table 7.4 provides a description of a specific browsing/choosing episode for each participant. The bold text indicates a detail in the description which is illustrated by an image shown from within the relevant episode.

Tobii eye-tracking images - when viewed in isolation from the other data sources used in this study - seem to provide a useful mechanism for identifying episodes of browsing/choosing. These data suggest that the images captured by the Tobii eye-tracking glasses are more likely to be coded within a 'browsing/choosing' episode than as

'walk through/glancing' images. As the data is viewed as a continuous series of images, it is also more straightforward to categorise and assign an interpretation to each episode. For example, as shown in the illustrative image below, it is clear that the participant is looking at the price offer label, given that the red dots on the image show where the participant is focusing their gaze.

Participant 018, female, Store 1, aged 46-55 years, occasional label user, Tobii

Similarly, in the example from data captured by participant 023 (shown below), it can be clearly seen that their gaze is fixed at the top of the label of the item in their hand (in this instance on the Reduced fat label – as shown on the detailed product image shown alongside the Tobii image)



"[What's going on here?] *Yeah. I think I was just looking around to see if there was anything, and I then, again not on the list but I bought some houmus* [Okay] *And I did look to see if I could find the healthiest one on there* [So the one you chose the one you would normally choose or…] *Yes, to be honest. With something like houmus, because I associate it with being slightly more healthy, we tend to try and get low fat* [So it's the fat bit that you…] *It's the fat content on that, yes"*

Participant 023, male, Store 2, aged 46-55 years, occasional label user, Tobii post-shop interview

In each instance, data from the post-shop interview again seems to help to clarify and provide additional detail about each purchasing episode.

Table 7.3: Browsing/choosing episodes, as captured by the Tobii eye-tracking glasses

Participant	Total shop time (seconds)	Total time of 'walk through/ glancing' images (seconds)	Total time of non-food images (seconds)	Total time of browsing/ choosing (seconds)	Length of browsing/ choosing time as percentage of total shop time (as detected by Tobii images) (seconds)	Number of episodes	Range of time spent	Total time looking at FOP label (estimated, via Tobii images) (seconds)	Description of episodes
018	429	96 (22%)	34 (8%)	297	69%	6	1s-3.03	5 (2%)	Grapes, fruit and vegetables, spring rolls, fat spreads, rice, freezers
020	565	226 (40%)	76 (13%)	263	46%	16	3s-55s	2 (1%)	Bananas, ready meals, bargain bins, different bargain bins, bread, cakes, rice, oils, jams, tinned meat/fish, Colman's sauces, bin end, tea/coffee, fruit juice, crisps, sweets
023	635	234 (37%)	74 (12%)	327	51%	13	3s-50s	7 (2%)	Bananas, cold meat, garlic, garlic again, other vegetables/salad, dips, ready meals, milk, bread, jam, baked beans, squash, cereal
026	667	246 (37%)	102 (15%)	319	48%	13	6s-1.23	-	Apples, bananas, baking ingredients, vegetable bargains, bargain fridge, bargain bin, bargain bread, Nutella, biscuits, cereals, bargain bin, different bargain bin, another bargain bin
027	1174	429 (36%)	429 (36%)	663	56%	24	2s-1.00	3 (0.5%)	Bananas, cooked meat, fresh pasta/ready meals, meat, meat bargains, yoghurt, cheese, fruit juice, bin end, mayonnaise, pasta, Chinese/cooking sauces, rice/noodles, crisps, cereals, frozen peas, baking ingredients, almonds, chicken, other meat, bacon/fish, fish again, meat/fish bargains, fruit

Table 7.4: A detailed description of a specific browsing/choosing episode for each participant, Tobii eye-tracking glasses

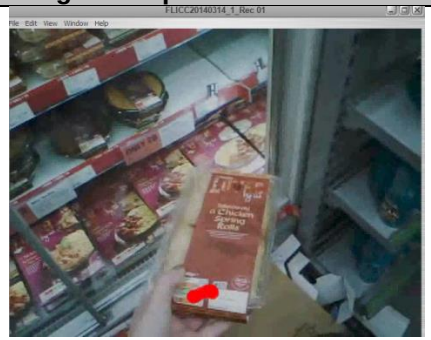
Participant		Episode description example	Image example	Interview
018	2.05-2.44 spring rolls	Comes around corner past loading trolley, glances down fridges, then returns to focus gaze on corner fridge. Scans shelves, looks at price information, opens fridge door. Picks up spring roll packet, puts it back and goes to pick up neighbouring pack, but then picks up original packet. **Looks at product label, including storage information and FOP label**. Looks at Loved by us label, puts pack in basket. Rescans shelves before leaving		*"I was looking for, because they have the vegetable spring rolls as well as the chicken spring rolls, and I was looking more specifically. I looked at the packet first, which were vegetable, which I do like as well but I was particularly looking, wanting to get the chicken ones ...* [Chicken ones, okay well we'll just run it forward a bit more and see where you're going there. Oh that looks like that's there…] *That's when I was getting them.* [Okay.] *I was um-ing, I think because, well I picked up one I think which was the vegetable one. [Well so that's the chicken one in the end.] Right. I think the vegetables are next to them.* [Ah, so here you are doing a real comparison there between the two but in the end you picked… And you went with the chicken ones in the end because...?] *Because again I'd had them for the first time but only last week as well. I've had the vegetable ones previously and I like them both but I just thought, having tasted the chicken ones, which I really enjoyed, I thought I would get them.* [What are you looking at on here? Looks to me like you're looking at… Let's have a look at the packet and see what that is. Ah, the freezing ...] *What I was looking at?* […by the looks of it.] *Down at the bottom, yes I was, yeah. Yeah because I wasn't sure whether, well I have had them before and I have frozen them so I, but I haven't actually bought these myself, I was with somebody else when I had them last week.* [Ah now what were you looking… Were you looking at the label there?] *Yeah possibly the label, or I don't know whether… "* Tobii post-shop interview

Table 7.4: A detailed description of a specific browsing/choosing episode for each participant, Tobii eye-tracking glasses

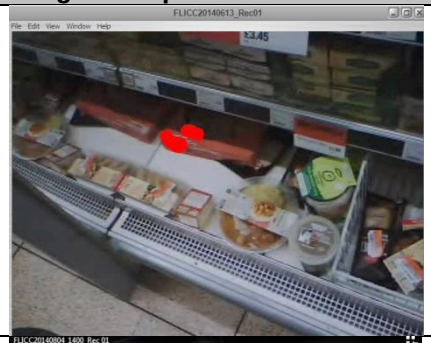
Participant		Episode description example	Image example	Interview
020	2.05-2.24 bargain bins	Fixes gaze on bargain area in bottom of fridge, scans different products in the area, **looks at label on salmon,** picks up 'Moma' product and places in basket, moves away		*"That again is very cheapskate individual. These are all again reduced chiller food, things. That's just a continuation of the theme* [Right okay. You are having a good look though aren't you?]" Tobii post-shop interview
023	4.33-5.14 bread	Scanning bread display, scans top shelf, then moves to baguettes, along to other end of display, gazes across aisle at other bread in promotional display bin, moves across to this bin, picks up a packet of bread rolls, looks at bottom shelf of display bin, moves gaze to neighbouring bread display, scans across different bread varieties, picks up packet from bottom shelf, **looks at label, including nutrition labelling but not FOP panel**, turns pack over, then places in basket, rescans bread display, looks at list, moves on		*"We're trying to cut down on wheat-based stuff, and we have been for a week or so now, but I knew we were short of pitta bread, so that is me trying to find pitta, which I think was on the bottom shelf* [And you're cutting down on the wheat because...?] *Just because we've had friends who have cut wheat out of their diet and they've found great health benefits to doing it. We haven't cut it out completely, and we do eat quite a lot of rice, which again mainly is white rice, mainly because of the taste because I'm not that keen on brown rice. But we do, what we're trying to do is actually mix a bit of brown rice in with stuff now. And we are trying to cut down the amount of bread we eat"* Tobii post-shop interview

Table 7.4: A detailed description of a specific browsing/choosing episode for each participant, Tobii eye-tracking glasses

Participant		Episode description example	Image example	Interview
026	6.37-6.58 biscuits	Scanning shelves of biscuits, focuses briefly on offer biscuits on top shelf, quickly moving gaze from one variety to another across different shelves, fixes gaze back on reduced price biscuits on top shelf**, looks at price on shelf**, looks at packet on shelf, picks up a packet, rescans shelf and moves away		
027	4.19-4.50 yoghurt	Shifts gaze to opposite fridge containing yoghurt, scans across display, top, middle and bottom of fridge, across different varieties, **returns gaze to focus on Onken branded yoghurt on top two shelves**, picks up a pot from the top shelf and puts it in trolley, rescans shelves, including variety just picked, then moves gaze around other varieties on display, top and bottom of display, then focuses on nearby products, before moving on		*"so, and then I was off to yoghurt* [And again was that on your list or…] *That was on my list, yeah. They seem to have cut down on the varieties they do so… I don't like one, but I don't like this Onken yoghurt you see so I prefer the… this one, that variety I prefer so…* [Oh yeah that one] *Yeah* [Okay. And again so that's a preference because?] *Well it's British for a start, yeah that's one thing and it's one… And also I think it's organic, that's right, and the other stuff I don't think is organic, so yeah* [So it's those two things that matter...] *Yeah [*So the British matters to you because...?] *Prefer to support British farmers* [Okay so it's about supporting the farmers] *Yeah* [And organic?] *Yes for some things I do prefer organic, I tend to buy organic milk and organic yoghurts and things like that* [Okay. So your preference is based on why, I suppose I'm interested to know why organic vs non-organic] *Well with things like milk products, the organic milk tends to contain more good stuff than…* [Okay. So it's a health, for you it's a health issue] *Yeah* [rather than taste or I'm trying to think of other reasons why you might buy it] *Mm. And the cows' are looked after better as well* [Ah okay] *That's the other reason as well* [So there's a welfare issue as well] *Yeah, welfare"* Tobii post-shop interview

iii) Autographer vs Tobii image data

Four participants who wore the Tobii eye-tracking glasses also wore the Autographer camera, as a back-up data capture tool. Table 7.5 compares the data gathered from the two different camera systems.

Table 7.5: Comparative data captured by the Autographer and Tobii eye-tracking glasses

Participant	Total shop time, as measured by Autographer (Seconds)	Total shop time, as measured by Tobii (Seconds)	Number of browsing/ choosing episodes captured by Autographer images	Number of browsing/ choosing episodes captured by Tobii images	Browsing/ choosing images as a percentage of total Autographer image time	Length of browsing/ choosing time as a percentage of total shop time (as detected by Tobii images)
018	420	429	1	6	12%	70%
020	660	565	5	16	29%	46%
023	600	635	8	13	50%	51%
027	1260	1174	13	24	48%	58%

These data suggest that the Tobii eye-tracking glasses were able to capture more episodes coded as ‘browsing/choosing’ than the Autographer. In the illustrative examples shown in Table 7.6 below, images taken with both the Autographer and Tobii eye-tracking glasses are compared for the same episode, with images selected to be as close as possible to the same section of the shop. In each example, it is possible to categorise and assign an interpretation to the image, with the Tobii eye-tracking glasses images providing more information than the Autographer images, as demonstrated by the captions assigned to each of the images.

Table 7.6: Example of episodes illustrated by images taken with the Autographer and Tobii eye-tracking glasses

Participant	Autographer image	Tobii eye-tracking glasses image	
020			*"*[And you did buy the rice here. So talk me through why you decided to buy the rice that you ended up with] *Popular with the younger daughter, useful as a really quick snack, good price, new variety that has obviously just come out for the World Cup. I hadn't seen it before so that probably tipped it* [Okay. So you'd obviously had that, and apart from the new varieties you've had it before ...] *Yes, yeah [*Oh now what are you looking at there?] *Oh I couldn't work out what was making it Brazilian. Whether it had little footballs in it or whether it had some sort of fruit, and I don't think I did discover what it was. But because it was new, we're getting a bit tired of the other ones, I bought it anyway "* Tobii post-shop interview
	Participant picks rice packet from shelf	Participant picks rice packet from shelf and focuses gaze on flavour description	
023			*"I then go on to buy some ham, and what I did notice, and I noticed you picked some of the items up, I was attracted by the 'Loved by us' brand on there, because I… less the traffic light stuff to begin with but that seemed to me to sort of say health on it* [Okay…And you spend quite a lot of time thinking about it, by the looks of it] *Yeah. I was conscious of you saying try and use the traffic lights system, so I was um-ing and ah-ing about which one to get. And in the end I ended up on the breaded stuff, which is probably slightly less healthy but again I think my daughter likes it* [Okay. So when you were look… Were you actually… Oh .let me see if I can stop that. Were you actually, did you… you looked at the label there, I saw you didn't I?] *Yes, yeah.* [So which bits were you looking at?] *I was looking at the fat content, to be honest, more than anything else* [Yeah we might as well look at it now whilst we've got it. So you're looking at that, versus the other one when you were looking at it, you were comparing it] *Yeah. But I mean they were very similar, but I went for that because, I don't know why, because I'm a man. I don't know* [Well and you said that your daughter liked it as well, that was the other consideration] *Yeah. Yeah yeah absolutely. So, but I did, I did look at the fat content, and saw that it was low* [And so when you saw that it was low, which bit of it was telling you it was low?] *It was the actual words on there rather than the green, yeah"* Tobii post-shop interview
	Participant faces cooked meat display shelf	Participant picks cooked ham from display and gaze fixes near FOP nutrition information panel	

Table 7.6: Example of episodes illustrated by images taken with the Autographer and Tobii eye-tracking glasses

Participant	Autographer image	Tobii eye-tracking glasses image	
027			*"Oh I'm looking for mayonnaise* [And how did you decide?]*That was a price thing in the end. Because I'd picked up the Hellmann's first of all, which is what we sometimes have, but the [name of participating supermarket] was quite a bit cheaper. And I do buy the light version of the mayonnaise rather than the full fat one* [Why?] *To try and avoid the fat in it* [Oh okay. That's a conscious decision?] *Yeah it was yeah. Actually my son is addicted to mayonnaise so I'm trying to reduce the amount of fat that he eats)* [Okay. So you're concerned about him?] *Yeah, mm* [Okay. And how did you decide that you'd get a lower fat one? Was it on the label or…] *I think it was the label, yes. It said it was low fat so…* [Okay. Ah there you are…] *I think I was probably checking the label anyway"* Tobii post-shop interview
	Participant faces display of mayonnaise	Participant faces display of mayonnaise, fixes gaze on one variety, appears to look at FOP nutrition information panel	
027			*"Oh no that is their ready meals actually, that's on the way round to the fish. And I did look at one packet of something that my mum had bought, but I put it… I decided against it because I don't usually buy ready meals* [Okay. So you were looking at it because she'd said] *Yes, yeah, she'd said."* Tobii post-shop interview
	Participant near to ready meals display	Participant faces ready meal display, focuses gaze near FOP nutrition panel	

As the Tobii eye-tracking images are more likely to be coded as browsing/choosing episodes rather than as 'walk-through/glancing' images when compared to similar coding of the Autographer images, this suggests that more data are available for interpretation and may also mean that fewer data are lost, as fewer episodes are missed.

It is clearer to establish in greater detail what participants paid attention to, and looked at, when viewing the Tobii eye-tracking glasses images but this is still not entirely straightforward. For example, it is not possible to establish for sure from the images alone whether or not the participant focused on the FOP nutrition information panel, as the red dots (which indicate where the participants gaze was held) are sometimes captured near but not exactly on this area of the packet.

The Autographer images cannot capture whether or not a participant paid attention to the FOP nutrition information panel and neither set of images provide information on the rationale for product choices.

Augmenting the image data with data from the post-shop interview appears to offer more contextual and explanatory information than is provided by the image data alone.

7.4.2 Assessing the post-shop interview prompts

Table 7.7 shows an analysis of the illustrative quotations from the post-shop interviews used in Chapter 5 and Chapter 6. This explored which of the three types of prompts (direct questions, product prompt or image prompts) being used in the interviews had generated specific date themes.

Most illustrative quotations used for the 'Think aloud' participants were as a result of the use of product prompts rather than direct questions from the interviewer. This was irrespective of whether the issue under discussion related to general factors influencing purchasing decisions or related specifically to the FOP nutrition information panel. An additional sample of quotations which appear in the data, but which are not used as

illustrations in either chapter, referred to as ‘non-quoted’ data was also assessed. A similar pattern of theme generation was consistently found.

Table 7.7: Prompts used in the Post-shop interview categorised according to data capture method

	Data capture method	Direct question	Product prompt	Image prompt
CHAPTER 4 – Themes around factors influencing purchasing decisions				
Illustrative quotations used (n=89)	‘Think aloud’ (n=34)	6 (18%)	28 (82%)	-
	Wearable cameras (n=55)	17 (31%)	5 (9%)	33 (60%)
Non-quoted data (sample, n=61)	‘Think aloud’ (n=24)	6 (25%)	18 (75%)	-
	Wearable cameras (n=37)	11 (30%)	2 (5%)	24 (65%)
CHAPTER 5 – Themes relating to the FOP nutrition information panel				
Illustrative quotes used (n=116)	‘Think aloud’ (n=44)	16 (36%)	28 (64%)	-
	Wearable cameras (n=72)	39 (54%)	27 (37%)	6 (8%)
Non-quoted data (sample, n=56)	‘Think aloud’ (n=19)	7 (37%)	12 (63%)	-
	Wearable cameras (n=37)	14 (38%)	16 (42%)	7 (19%)

For the ‘camera-wearing’ participants, image prompts generated most of the illustrative quotations for themes about general factors influencing purchasing decisions. In contrast, most illustrative quotations relating to FOP nutrition panel specific information resulted from direct questioning by the researcher during the interview, followed by product prompts. Image prompts provided relatively little data about the FOP nutrition information panel. This pattern of theme generation was broadly seen in other ‘non-quoted’ data, with image prompts generating information about general factors influencing purchasing decisions and image prompts provided the smallest proportion of data about the FOP nutrition information panel. In the ‘non-quoted’ data, product prompts and direct questions provided a similar proportion of data.

7.5 Assessing the consistency of application of prompts by the researchers

Table 7.8 provides illustrative quotations from the data which describe and characterise the type of prompts used by the three researchers across the different data capture methods used in the study. The data suggest that the type of prompts used by the researchers were consistent and similar across each of the methods used.

Table 7.8: The types of prompts used by researchers across the three data capture methods

	'Think aloud' shop	'Think aloud' post-shop interview	Autographer post-shop interview	Tobii post-shop interview
General prompt	"What are you looking at?" Researcher 1 to participant 015, female, Store 1, aged 46-55 years, rarely label user "Talk me through it…" Researcher 2 to participant 005, female, Store 1, aged 36-45 years, occasional label user "What are you thinking when you choose that?" Researcher 3 to participant 011, male, Store 1, aged 26-35 years, often label user	"So tell me, you picked those, you walked past the fresh version of the Quorn *[Oh the fresh Quorn stuff, yeah]* Talk me through why you went for these in the end" Researcher 1 to participant 001, female, Store 1, aged 36-45 years, occasional label user "So what made you decide to buy these today?" Researcher 2 to participant 014, male, Store 1, aged 46-55 years, always label user	"So what's going on here?" Researcher 3 to participant 010, female, Store 1, aged 46-55 years, occasional label user	"So talk me through what's happening here" Researcher 1 to participant 018, female, Store 1, aged 46-55 years, occasional label user
Specific image prompt (initiated by researcher)	No image data	No image data	"I'm kind of looking on this bit here really *[Yeah, that's the fish and things, yeah. Fish and meat, yeah]* Did you buy anything from in here?" Researcher 1 to participant 002, female, Store 1, aged 46-55 years, occasional label user	"What was in here? I can't tell…" Researcher 1 to participant 020, female, Store 2, aged 46-55 years, often label user
Specific image prompt (initiated by participant)	No image data	No image data	*"And this is the biscuit thing going on – what biscuits do I have* [ah yes] *And I got really faffled about the fact that there was two packets exactly the same, but one was flat and one was upright, and I was really like what's the difference between these two then? So I went for the one that wasn't damaged, I thought Oh, I'll go for the one that I know they're not cracked you know inside"* Participant 004, female, Store 1, aged 36-45 years, rarely label user to Researcher 1	*"I think I must have given up at this point and thought I thought I'm going to look, I'm also going to look. What was I looking for here? I was looking for meat, that's right, I was looking for some sausage meat actually, yeah, but they don't seem to sell it"* Participant 027, female, Store 2, aged 46-55 years, often label user

Table 7.8: The types of prompts used by researchers across the three data capture methods

	'Think aloud' shop	'Think aloud' post-shop interview	Autographer post-shop interview	Tobii post-shop interview
Specific label-related prompt	"Don't forget to use labels by the way *[looking at the contents? Sorry]* Just use them to help you choose" Researcher 3 to participant 008, female, Store 1, aged 66-75 years, occasional label user	"Is there anything on the packet in terms of – we'll just use this one as an example, but it could be any of them – that appeal to you? You said the picture. Anything else?" Researcher 1 to participant 022, female, Store 1, aged 46-55 years, rarely label user	"Because we asked you to look at the labels, and what was interesting so far, what you said is when you did look at them, certainly the orange juice, you looked at the back, you turned it over and looked at the pack of the pack, you didn't look at the front of the pack at all, did you? *[No I don't think I did actually, no. I just, well automatically went to the back of the pack]"* Researcher 1 to participant 012, male, Store 1, aged 26-35 years never/often label user	"One of the reasons I pulled that out actually was because I was interested in the labelling of it. So we'll have a little but more of a detailed chat about it. And there's that's obviously you looking at it" Researcher 1 to participant 023, male, Store 2, aged 46-55 years, occasional label user
Explanation given by researcher	"If you just want to carry on and do your normal shopping we can start *[and it's any element, you haven't got a particular… I know you have got, I know your research has got a particular focus but you're interested in the whole decision making?]* You can buy whatever, absolutely. Whatever is important to you" Researcher 1 to participant 013, female, Store 1, aged 56-65 years, occasional label user	"So one of the focuses for us is about pre-packaged food *[oh yeah]* And so I've picked out three of the pre-prepared foods that you've purchased today, so I'd like to talk about each of them in turn" Researcher 3 to participant 011, male, Store 1, aged 26-35 years, often label user	"So this is actually the pictures that we took at the beginning of you starting your shop *[oh right yeah]* Let's have a quick look. What I'll do is I'll just click through *[yes, fine]* and then if we see anything that's sort of vaguely interesting… now your branflakes, sorry your Fruit and Fibre isn't it, we're going to talk about" Researcher 1 to participant 006, female, Store 1, aged 46-55 years, often label user	"Okay scoot on a bit. Oh here we are, might see some better, ah this is you choosing the, can you see the red dots are actually on what you were looking at" Researcher 1 to participant 026, female, Store 2, aged 26-35 years, often label user
Confirmation of participant thought by researcher	*"[If I but six [hot cross buns], I might eat six]* Easy to eat" Researcher 2 to participant 009, female, Store 1, aged 66-75 years, often label user	"I remember you saying you looked at it and it had no mayonnaise in it *[It didn't. Its salt content was low]* It was the salt you were looking at" Researcher 1 to participant 024, female, Store 2, aged 66-75 years, occasional label user	*"[So I was just wanted something plain that we could use for dips and stuff]* Yes, so that's why you chose those, because they're plain *[Yeah. But I did sort of go further down the aisle but they didn't have what I wanted]"* Participant 016 to researcher 1, female, Store 1, aged 36-45 years, often label user	*"[Oh no I was looking for fresh pasta, to see how much the fresh pasta was actually, so I decided it was cheaper to buy dry stuff]* Okay, so that was the price" Researcher 1 to participant 027, female, Store 2, aged 46-55 years, often label user

Table 7.8: The types of prompts used by researchers across the three data capture methods

	'Think aloud' shop	'Think aloud' post-shop interview	Autographer post-shop interview	Tobii post-shop interview
Extension of participant thought by researcher	"No? You haven't noticed it?" Researcher 3 to participant 025, female, Store 2, aged 56-65 years, rarely label user	"But you mentioned salt as well for the bread didn't you?" Researcher 1 to participant 001, female, Store 1, aged 36-45 years, occasional label user	*"[Strong cheddar, I like that for making sauces, stronger the better, if it's on offer]* Okay. Was it on offer today? [*It's on offer today yeah]"* Participant 031, female, store 2, aged 66-75 years, often label user to Researcher 1	"There we go, this is you're looking for croissants or something particularly? *[Offers]* The offers. Would that be typical of your top-up shop? Where you're looking for that kind of bargain?" Researcher 1 to participant 020, female, Store 2, aged 46-55 years, often label user
Intervention by researcher	*"[I'm looking for some Quorn escallops for my son. I thought they did have some. Maybe that…]* They've got them here" Researcher 3 to participant 008, female, Store 1, aged 66-75 years, occasional label user	"…You were sort of saying 'Well I'm not really sure what the colours mean' What these colours are actually trying to tell you is that this product is high in saturated fat *[right]* and that's what the red colour is telling you" Researcher 2 to participant 005, female, Store 1, aged 36-45 years, occasional label user	"Ah okay, so that's… Oh yes you have got two because I remember seeing them in your basket. Okay so let's read your list. You need red pesto, you need Pom Bears, we'll see where they come in a minute" Researcher 1 to participant 028, female, Store 2, aged 26-35 years, rarely label user	"So you look like you're pretty familiar with the layout…" Researcher 1 to participant 023, male, Store 2, aged 46-55 years, occasional label user

7.6 Summary

Table 7.9 shows an analysis of the relative contribution of the different methods of data capture used in generating the themes found within the data presented in this thesis.

The data suggest that the ‘Think aloud’ shop, when viewed alone as a method of data capture, was not successful at generating explanatory information from participants about their use and understanding of the FOP nutrition information panel, although it was a useful mechanism by which to gather data themes relating to general factors which influence their purchasing decisions. Augmenting the ‘Think aloud’ shop with a post-shop interview seems to have been a successful approach, with participants providing detailed information about the FOP nutrition information panel especially in response to the use of product prompts and specific questions.

Similarly, wearable camera images appear to be a useful trigger for discussion in the context of a post-shop interview and generated a similar type and depth of information from ‘camera-wearing’ participants about the general factors which influence their purchasing decisions as was elicited from participants during the ‘Think aloud’ shop and post-shop interview. This could suggest that the images function as a type of product prompt, triggering participants to articulate the rationale behind their choices in a similar way as they might be prompted when paying attention to products on the supermarket shelves during a ‘Think aloud’ shop.

The images from wearable cameras, when viewed as a stand-alone method of data capture, can assist in helping to identify episodes of browsing and choosing of products, in particular by identifying where participants spend their time during their shop. Despite being problematic for researchers to use, the Tobii eye-tracking glasses provided more data for analysis than the Autographer, gathered some specific information about the attention given by participants to the FOP nutrition information panel and were acceptable

to participants. However, the most detailed and informative data were generated during the post-shop interview, where direct questions and product prompts were more useful in eliciting a broader understanding of participants' views and use of the FOP nutrition information panel than the wearable camera images. The data suggest that only a very small proportion of shopping time was spent by any participant in attending to the FOP nutrition panel information (and the data collection protocol required researchers to wait for spontaneous mention of the FOP nutrition information panel by participants prior to specifically prompting its discussion). It could be that direct questions (and specific referral to the FOP nutrition information panel on a product during a product prompt) are required to encourage some participants to even consider this information.

Table 7.9: Summary of an analysis of the relative contribution of the different methods of data capture used in generating data themes

	Think aloud				Wearable cameras									
					Autographer					Tobii				
	Shop	Post-shop interview			Images alone	Post-shop interview				Images alone	Post-shop interview			
			Direct questions	Product prompts			Direct questions	Product prompts	Image prompts			Direct questions	Product prompts	Image prompts
Themes around Factors influencing purchasing decisions (as discussed in Chapter 4)	+++++	+++++	+	++++	+	++++++	++	+	+++	+	++++++	++	+	+++
Themes around Using the FOP nutrition information panel (Chapter 5)	+	+++++	++	+++	-	++++++	+++	++	+	++	++++++	+++	++	+

Key: More + equals greater contribution to data themes generated per data capture source

8. DISCUSSION AND CONCLUSIONS

8.1 Overview

This chapter provides a summary of the study findings and considers these in relation to the study aims and to the existing evidence base. I describe the strengths and limitations of the research, highlight its novel contribution and consider in what ways this research may inform the future development of the FOP nutrition information panel for a range of stakeholders.

8.2 Study aims and main study findings

This thesis reports on a qualitative study which set out to investigate the factors which influence consumer decision-making at point-of-choice, to understand how shoppers use the FOP nutrition information panel during routine supermarket shopping and to explore whether wearable cameras are a useful data capture tool which can assist researchers to understand how shoppers use the FOP nutrition information panel when they shop.

The study findings characterise food shopping as a complex, involved activity and suggest that - in the hectic store landscape - participants give priority to a range of different issues including price, presentation, appearance and taste over health concerns. Participants appeared to be balancing numerous competing - and sometimes conflicting - factors when they were making decisions about which products to purchase. They reported being aware of making these decisions in an environmental context which was designed to encourage unplanned purchases. The study did not detect any spontaneous use of the FOP nutrition information panel amongst participants and its use was not observed to be frequent even when participants were asked to use it immediately prior to their shop. As participants reported that the shopping episode which they undertook as part of the study was similar to their ‘normal’ shopping, this suggests that using the FOP nutrition information panel is not typically part of their decision making process when food products are chosen. Participants confirmed this by reporting that its impact on their purchasing was low. Some participants did

use the FOP nutrition information panel during the study shop, more reported sometimes using it and even those who did not currently make use of it provided a considered view about its use and how it could be improved. Using several methods to collect data uncovered an interesting - and unexpected - difference in the type of data captured by each method. Taking part in the 'Think aloud' shop or viewing images post-shop amongst camera-wearing participants appeared most useful in generating data relating to general factors which influenced shopping decisions but less information was produced by these methods about specific use of the FOP nutrition information panel. Most of the data relating to the use of the FOP nutrition information panel were generated during post-shop interviews in response to the use of product prompts and direct questioning by researchers. The Tobii eye-tracking glasses, despite being tricky to use in practice, provided more data suitable for analysis than the Autographer and generated information specifically related to FOP nutrition information panel use. The interpretation of image data from both types of device was enhanced when analysed alongside contextual data from the post-shop interviews.

8.3 Discussion and implications

In this section, I consider how the key findings of my study relate to other research, with a focus on recently emerging literature. As it is within this context that the FOP information panel is placed, initially I reflect on the supermarket environment in which the participants make their choices and how this and other issues are reported to impact on their purchasing decisions. Secondly, I discuss the detailed findings of the study relating to reported use of the FOP nutrition information panel. Finally, I focus on the findings from the use of different methods of data capture.

8.3.1 Making healthy choices in a supermarket environment

Shoppers in this study reported the need to trade-off a myriad of different considerations when making purchasing decisions. The findings support existing evidence which shows that a range of other factors influence decision-making at point of choice ahead of concerns of

health and nutrition, including price, quality, promotion and taste (Chandon P and Wansink B 2012, Barnett J, Vasileiou K et al. 2013, Benn Y, Webb TL et al. 2015, Statistica 2015). Decisions were also reported to be influenced by personal preferences and practical management issues within the household. Participants in this study appeared susceptible to cues within the planned retail environment when making their choices, particularly in relation to price and promotions, although decisions seemed to be based on a combination of thoughtful and impulsive behaviour. Findings are consistent with social ecological theories which postulate that behaviour is influenced by a range of intrapersonal, interpersonal, environmental and policy related factors (Glanz K, Rimer BK et al. 2008).

Stores need to capture the attention of shoppers in order to increase unplanned - or impulse - purchases, which provide valuable sales for the retailer (Nordfalt J 2009, Bell DR, Corsten D et al. 2011, Cohen DA and Babey SH 2012). Products are presented, placed, priced and promoted in ways to encourage purchase (Chandon P, Wesley Hutchinson J et al. 2009, Hawkes C 2009, Cohen DA and Babey SH 2012) and the most prominent displays tend to be for less healthy products (Economic and Social Research Council 2014). Cohen and Babey (2012) argue that consumers are likely to be unaware of some of the mechanisms in which their shopping behaviour is cued by contextual factors which favour selection of foods high in fat, sugar and salt. They, and others, suggest that cognitive, deliberate decision-making may be overwhelmed when faced with such an environment with shoppers instead relying on heuristic, non-cognitive processes which are more likely to lead to unhealthy dietary choices (Cohen DA and Babey SH 2012, Kalnikaitė V, Bird J et al. 2013). Other authors agree that consumers need greater support to make healthier shopping decisions in such a complex and potentially ‘hostile’ environment (Swinburn B, Egger G et al. 1999, Butland B, Jebb S et al. 2007, Van Kleef E and Dagevos H 2015). The predominant narrative amongst participants who were aware of retailer practices to boost sales was one of irritated resignation that an additional burden had been added to their shopping experience.

8.3.2 Using the FOP nutrition information panel

i) Attending to the label

Initially, shoppers need to notice and attend to nutrition information before they can make use of it as part of their decision making. Attention from consumers reflects a combination of 'exposure' to the information (the information being available on pack in store) and the consumer noticing the information during the 'search' element of the process outlined previously in Figure 2.5.

Research indicates that the time taken, on average, for shoppers to look at a food product before selection varies between 6 and 35 seconds per product (Grunert KG, Fernández-Celemín L et al. 2010, Sutherland LA, Kaley LA et al. 2010, Royal Society for Public Health 2016). UK shoppers were found to take an average of 29 seconds to make their selection in a study by Grunert *et al* (2010), although this varied according to product category (41 seconds for ready meals and 23 seconds for carbonated soft drinks). The authors suggest that this indicates that purchases are not entirely habitual and shoppers do take time to consider their choices (Grunert KG, Wills JM et al. 2010). However, this still provides a relatively limited window of opportunity for the FOP nutrition information panel to capture the attention of shoppers as they make their choice.

In a complex 'busy' retail environment, when shoppers have so many competing cognitive interests, it is perhaps not surprising that the participants appeared to give little attention to the FOP nutrition information panel, despite reporting themselves to be at least occasional label users. The study findings are consistent with other research which shows that observed use of nutrition labelling is lower than declarations of self-reported use (Rayner M, Boaz A et al. 2001, Cowburn G and Stockley L 2005, Malam S, Clegg S et al. 2009, Grunert KG, Fernández-Celemín L et al. 2010, Graham DJ and Jeffery RW 2011). Consumers seem to pay little attention to nutrition labels in a real life context, with researchers suggesting that this may be due to a lack of motivation and differing food consumption goals alongside the

priority given to price, taste, convenience and habit during decision making (Grunert KG, Fernández-Celemín L et al. 2010, Storcksdieck genannt Bonsmann S and Wills JM 2012, Chalamon I and Nabec L 2016). Low levels of attention to nutrition information have also been reported during on-line supermarket shopping (Benn Y, Webb TL et al. 2015).

My findings appear to confirm research which reports that traffic light labelling and/or associated text descriptors are likely to catch the attention of shoppers more than other kinds of nutrition label (Antúnez L, Vidal L et al. 2013, Bix L, Sundar RP et al. 2015, Becker MW, Sundar RP et al. 2016). However, participants in my study also reported being distracted from the FOP nutrition information panel by the presence of other information on the front of pack. Research has suggested there may be an interaction between different forms of labelling shown on packaging although further investigation is needed to understand in which circumstances' additional information on the front of pack might be helpful or distracting. Talati *et al* (2016) investigated the combined effect of FOP nutrition labels and health claims on consumer evaluations of food products amongst Australian shoppers taking part in focus group discussions. Shoppers were deliberately presented with conflicting information on mock packages and were found to trust the FOP nutrition information more highly than health claim information and to prioritise its use when they thought the FOP nutrition information was easy to understand (Talati Z, Pettigrew S et al. 2016). Little has been reported about how congruent rather than conflicting nutrition information might be viewed by consumers so the impact of a proposal to introduce, for example, 'activity equivalent' calorie labelling (Royal Society for Public Health 2016) is currently unknown.

Out of store eye-tracking research has shown that consumers spend 25 -100 milliseconds looking at nutrition labels (Storcksdieck genannt Bonsmann S and Wills JM 2012) which is consistent with the eye-tracking data captured in this study, where participants appeared to spend very little time during their shop attending to the FOP nutrition information panel. In their eye-tracking study, Antunez *et al* (2013) reported findings common in the experimental,

laboratory-based, literature which show that consumers attend to nutrition information when asked to achieve a nutrition-related goal but do not necessarily use the information to complete the task (Antúnez L, Vidal L et al. 2013).

ii) When is the label used and by whom?

Attending to the FOP nutrition information panel thus appears to be an important first step for shoppers but further processing of the information seems to be required for it to be understood and used to inform purchasing decisions. A range of different factors (including perception, familiarity, liking and understanding) are known to affect whether and how nutrition label information is used (Grunert KG, Wills JM et al. 2010).

Participants in my study who used the FOP nutrition information panel during their shop did so to make product comparisons or to identify the content of specific nutrients in a single product. Similarly, those participants who reported using the label (at least sometimes) used it with new or unfamiliar foods, when making direct comparison between products or if they thought that a product might be unhealthy. This confirms research which found that nutrition information was more likely to be attended to when purchasing a food for the first time (Ares G, Giménez A et al. 2013, Benn Y, Webb TL et al. 2015, Kleef E and Dagevos H 2015), during product comparisons (Higginson C, Kirk TR et al. 2002, Malam S, Clegg S et al. 2009) and (in a laboratory context) when viewing unhealthy or ambiguous food products (Graham DJ and Jeffery RW 2012, Bix L, Sundar RP et al. 2015). Grunert *et al* (2010) found that proportionally more shoppers were able to understand how to successfully make intra-category comparisons between products than were observed making these comparisons during their actual shopping (Grunert KG, Fernández-Celemín L et al. 2010).

Participants reported being less likely to use the FOP nutrition information panel if they were already familiar with a product, consistent with other research which has also reported that product familiarity influences nutrition information use (Grunert KG, Fernández-Celemín L et al. 2010, Grunert KG, Wills JM et al. 2010, Benn Y, Webb TL et al. 2015). Participants

appeared less likely to pay attention to labelling on products which they already judged to be unhealthy, suggesting that their use of label information may be influenced by product category. Grunet *et al* (2010) found that participants were more likely to look at 'healthy' yoghurt labels and least likely to look at labels on 'indulgence' confectionery products (Grunert KG, Wills JM et al. 2010). Hodgkins *et al* (2015) found that consumers rated different product categories differently, underestimating the healthiness of pizza and yoghurt and overestimating the healthiness of biscuits (Hodgkins CE, Raats MM et al. 2015).

Participants in this study were predominantly female, of mixed age group, well-educated, employed and declared themselves to be in good health. They held broadly positive attitudes towards healthy eating, reported a moderate to healthy typical dietary pattern and most rated their nutrition knowledge to be good or very good. As such, the participants appear to be similar to 'typical' label users reported in the literature – who tend to be female, well-educated, nutrition and/or health aware and with a good nutrition knowledge (Baltas G 2001, Cowburn G and Stockley L 2005, Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007, Grunert KG, Fernández-Celemín L et al. 2010, Campos S, Doxey J et al. 2011, Hieke S and Taylor CR 2012, Storcksdieck genannt Bonsmann S and Wills JM 2012, Christoph M, An R et al. 2015). Participants also over-reported their use of nutrition label information compared with observed use, a finding also consistent with 'typical' label readers in the broader literature. Very little is reported in the literature about the nutrition label use patterns of minority ethnic groups (Malam S, Clegg S et al. 2009, Campos S, Doxey J et al. 2011, Van Kleef E and Dagevos H 2015) and this study cannot contribute to this knowledge gap because all but one of the participants identified as white British. Similarly, this study can add little to the paucity of data which is available which relates to the impact of nutrition labelling on populations living with in deprived communities and/or with limited income. Limited review data suggests that individuals with lower incomes are less likely to use labels than the general population (Cowburn G and Stockley L 2005, Ni Mhurchu C and Gorton D 2007, Campos S, Doxey J et al. 2011, Hieke S and Taylor CR 2012) and that individuals

from socially disadvantaged areas perform less well in objective tests of label use (Grunert KG and Wills JM 2007, Hawley KL, Roberto CA et al. 2012).

Grunert *et al* (2010), in their study based on in-store observations and interviews supplemented with questionnaires completed at home, postulate that *understanding* of FOP nutrition information can be attributed to nutrition knowledge amongst consumers whereas *use* of the information is the result of interest in healthy eating (Grunert KG, Wills JM et al. 2010). In their review of the impact of nutrition knowledge on the use of BOP nutrition information, Soederberg Miller and Cassady (2015) found that nutrition knowledge related to how effectively consumers were able to engage with nutrition information. They suggest that nutrition knowledge might work in several ways to help consumers – it might enable shoppers to ignore other marketing information and focus on relevant nutrition information, it might help them to interpret and remember information and could support the recall of the understood and remembered information so that it can be applied to a food choice (Soederberg Miller LM and Cassady DL 2015). A novel finding of my study provides some evidence in support of this, in that one participant reported that taking time to read the FOP nutrition information panel would help them to recall the nutritional composition of products in the future. Another participant reported finding text descriptors for products which she had previously examined easy to recall.

Review data suggests that more educated consumers may choose not to use nutrition labels but rely on their existing knowledge to guide food selection (Hieke S and Taylor CR 2012). In common with other research (Ronteltap A, Sijtsema SJ et al. 2012), participants in my study appeared to be judging the healthiness of food products based on a combination of factors including their previous experience of the nutritional content of a food alongside an assessment of how frequently they believed they consumed it. Although participants reported themselves to have at least ‘good’ nutrition knowledge, they reported a lack of certainty over appropriate recommendations and/or benchmarks for specific nutrients and several appeared either not to realise what the % RI figures represented or misunderstood

their purpose. Participants seemed vulnerable to ‘unrealistic optimism’ (where people believe their own risk is less than the risk of their peers, (Weinstein ND and Lyon JE 1999)) in terms of the healthiness of their overall diet and/or how frequently they purchased ‘less healthy’ products for consumption. In their qualitative study to understand how different food consumption goals influenced the reading of on-pack nutrition information, Chalamon and Nabec (2016) found that French consumers with differing goals adopted different heuristic processes to select the nutrition information which they would consider in their evaluation of food products. The authors suggest that these heuristic processes lead to a series of potentially problematic inference biases. Firstly, they found that consumers with goals which prioritised either ‘enjoyment of food’ or ‘food as a necessity’ were open to an optimism bias which tended to result in the underestimation of negative nutrient quantities which could lead to overconsumption of less healthy foods. Secondly, consumers with goals orientated by ‘optimization of intake’ might be open to an optimism bias which overestimates the positive nutrient qualities of foods (highlighted by health claim labelling, for example) and tends to ignore the more negative nutrients. The third inference bias was found in consumers with goals relating to ‘food regulation’ where focusing on prohibitive rules for food intake might limit the intake of sufficient positive nutrients for health (Chalamon I and Nabec L 2016). It has been proposed that optimism biases attributed to the reading of nutrition information might prompt a ‘halo’ effect, where positive nutritional attributes lead to a generalised (possibly over-) positive evaluation of other aspects, for example, what constitutes an appropriate portion size to consume or how attractive the product appears (Williams P 2005, Van Kleef E and Dagevos H 2015, Chalamon I and Nabec L 2016, Sorensen MR and Holm L 2016). Perceived healthiness is thought to be associated with a reduction in guilt feelings about consumption and the acceptability of increased portion size, and so may induce overconsumption of ‘healthy’ foods (Wansink B and Chandon P 2006, Kerr MA, McCann MT et al. 2015).

iii) Label format

Consumer preference of a particular label format is an important part of the decision process which encourages its use (Grunert KG and Wills JM 2007). The participants in my study reported mixed views about the different formats of FOP nutrition information panel which they had seen. On balance, there was a preference expressed amongst the participants for the hybrid FOP label because it was considered to be clear and easy to use. Participants liked the traffic light colour-coding and the text descriptors, although this was not a universally held view. More participants reported being put off or confused by the presence of % RI and/or gram figures than those who reported them to be helpful. The mixed views about format expressed by participants is reflected in the literature, where findings suggest that format can influence consumers' ability to understand (and use) the label information.

Malam *et al* (2009) reported that the strongest format for consumer comprehension was a nutrition label which combined text, traffic light colours and % GDA (Malam S, Clegg S et al. 2009). In their review, Temple and Fraser (2014) favour traffic light and descriptor labelling (Temple NJ and Fraser J 2014). Grunert *et al* (2010) found that their study participants could understand FOP nutrition information and make correct inferences about the healthiness of a product, regardless of the format in which nutritional information was presented (Grunert KG, Wills JM et al. 2010). Siegrist *et al* (2015) conducted an eye-tracking study where Swiss consumers were asked to assess the healthiness of five different foods from different food categories using one of three different formats of FOP nutrition information. They reported that traffic light and % GDA format labels were more efficiently processed than a nutrition table label, suggesting this was because both traffic light and % GDA labels provide contextual information which reduces processing time. Comparisons between the traffic light and % GDA label showed that both formats could be efficiently processed but that the traffic light format took less time which the authors argue may facilitate its use in a real-life context, where decisions need to be made quickly. Adding numerical information to a label (as with

the % GDA format) increased the time needed to interpret the information (Siegrist M, Leins-Hess R et al. 2015).

Ducrot *et al* (2015) investigated the acceptability and effectiveness of the 5-Color Nutrition label (a graded summary label) against 3 other label formats (% GDA, a multiple traffic light format and a simple summary health logo) and no label in helping French consumers to assess the nutritional quality of products across a range of product categories. The researchers found that each label format was effective in enabling consumers to appropriately rank products in comparison with no label, with the 5-Colour Nutrition label out-performing other label formats, followed by the multiple traffic light format, the % GDA format and the simple summary health logo. No single label format emerged as most acceptable to consumers (Ducrot P, Mejean C et al. 2015). A study assessing the impact of the 5-Colour Nutrition label on the nutritional quality of purchases in an artificial store environment found that it had a limited impact on purchases in one food category (sweet biscuits) but no impact on other product categories (Julia C, Blanchet O et al. 2016). A randomised controlled trial in a web-based virtual supermarket found that exposure to the 5-Colour Nutrition label resulted in consumers selecting products with the highest overall nutrition quality in comparison with no label exposure (Ducrot P, Julia C et al. 2016). The multiple traffic light label format and the simple summary logo also performed well, but less well than the %-Colour Nutrition label, in comparison with no label. The % GDA label format performed no better than no label. The authors suggest that the 5-Colour Nutrition label out-performed the other formats because it presents a graded summary of the nutritional attributes of a food which helps consumers to resolve potential conflicts between the different nutrients displayed in the multiple traffic light or % GDA formats (Ducrot P, Julia C et al. 2016). In their experimental choice study, Hodgkins *et al* (2015) found that consumers could successfully use any of several FOP nutrition label formats (including the traffic light, % GDA format and hybrid traffic light/% GDA format) to assess the healthiness of foods across three different food

categories with distinctly different levels of healthiness (Hodgkins CE, Raats MM et al. 2015).

Consistent with the views of participants in my study, Hodgkins *et al* (2012) found that some consumers viewed simpler label formats as more impactful and attractive, finding labels providing more information to be complex and difficult to understand. Other consumers found label formats with more complete information to be clearer and easier to understand than simpler formats and preferred these. The authors suggest that although simpler information may be more useful under time pressure (such as when using labels in a real-life context) some consumers might be reassured by the presence of complex nutrition information, even if they do not actually use it in their choice (Hodgkins C, Barnett J et al. 2012). Hamlin *et al* (2014) report that their participants paid attention to the presence of either traffic light or % Daily Intake (equivalent to % GDA) format FOP labels but used these labels as an indicator of product desirability rather than using the information to evaluate the nutritional content of the breakfast cereals under assessment (Hamlin RP, McNeill LS et al. 2015).

Participants in my study reported being confused by the presence of different label formats which could account for some of their reluctance to use the information. Graham and Jeffery (2011) found that participants in their laboratory-based eye-tracking study of the US Nutrition Facts label were most likely to view nutrients placed near the top of the label (Graham DJ and Jeffery RW 2011). My findings provide some evidence that using out of date metrics to interpret nutrition labels (for example, assuming that the presentation of nutrient order on the hybrid format was related to nutrient quantity, as with ingredient information) are also adding to the confusion of consumers. Differing formats are known to create confusion and frustration amongst consumers, with consistency of format and positioning helping shoppers to access information (Malam S, Clegg S et al. 2009, Storcksdieck genannt Bonsmann S and Wills JM 2012, Van Kleef E and Dagevos H 2015).

My findings support the adoption of a consistent FOP nutrition label format. Participants held different views about the value and importance of elements within the label which suggests that no single format will be preferred by all consumers. Consequently, the current hybrid label format may be able to satisfy the widest range of consumer preferences providing that these labels can attract attention in a competitive store environment.

iv) Colour-coding

Participants in my study were generally able to interpret the traffic light colour-coding on the hybrid label format, suggesting it was easy and quick to use. However, in a novel finding from my study, this was not universally the case. Some participants appeared to be confused by the purpose of the traffic light colours – assuming that the colour-coding related to the general properties of a nutrient rather than relating to the specific amount of a nutrient in a given amount of a food or presuming that the traffic light coding was supposed to indicate a daily guideline amount. This suggests that, for some, interpretation of traffic lights is not intuitive and that colour-coding requires further explanation to enable these consumers to understand how it is designed to be used. There was also an indication of misinterpretation caused by exposure to different colour presentations of information on FOP nutrition labels, with some shoppers attributing the colours used in monochrome % GDA formats as meaningful rather than presentational. This supports the need for consistent presentation of information to assist consumers to correctly interpret the available information on front of pack.

The findings from my study support other research which has shown that consumers are more alert to red colour-coding when using the traffic light element of the FOP nutrition information panel. Scarborough *et al* (2015) reported that consumers who took part in an online choice experiment assessing the healthiness of different labels depicting the four key traffic lighted nutrients on UK labels were more concerned with avoiding nutrients coloured red than choosing nutrients coloured green. They cite two other studies which found that UK

and German consumers reported a similar alertness to red over orange and green (Scarborough P, Matthews A et al. 2015). Grunert *et al* (2010) found evidence that consumers tended to consider amber and red traffic light colours more negatively than necessary (Grunert KG, Wills JM et al. 2010).

v) Specific nutrient labelling

When focusing on specific nutrient information, participants in my study tended to look at fat and saturated fat ahead of salt and sugar, with energy levels appearing to be of little interest to participants. Other studies report mixed findings. Higginson *et al* (2002) reported that consumers focused their attention on fat and energy information when primed to shop for nutrition-related consumption goals (Higginson C, Kirk TR et al. 2002) whereas Scarborough *et al* (2015) report that saturated fat and salt had more influence on their consumers' decisions around healthiness (Scarborough P, Matthews A et al. 2015). In an experimental study, a group of Polish consumers prioritised the use of salt and fat to judge the healthiness of different food products (Wasowicz-Kirylo G and Stysko-Kunkowska M 2011).

Interpretation of the FOP nutrition information panel appeared to be most difficult for some participants when they tried to consider how to process conflicting information between nutrients. In most instances, participants adopted a simple approach and prioritised the information about the nutrient which was most salient to them, suggesting the use of heuristic approach. Wasowicz-Kirylo and Stysko-Kunkowska (2011) found that energy level (provided in kilocalories) appeared to act for consumers as a marker for healthiness, making other information less relevant (Wasowicz-Kirylo G and Stysko-Kunkowska M 2011). A participant in my study also reported using energy labelling as a proxy measure for healthiness.

vi) Portion size labelling

The finding that portion/serving size information was a cause for confusion for participants is consistent with review level data which suggests that portion size information can be difficult for consumers to interpret (Cowburn G and Stockley L 2005). More recent research suggests that this remains an important point of confusion. Grunert *et al* (2010) found interpretation of information about portion size and/or 100g measure to be problematic (Grunert KG, Wills JM et al. 2010). In their review of nutrition labels used in the USA and Canada, Temple and Fraser (2014) suggest that consumers find product comparison more difficult when different portion sizes are displayed (Temple NJ and Fraser J 2014). Kerr *et al* (2015) report research which suggests that although some consumers can interpret simple portion size information, this information may be overlooked (Kerr MA, McCann MT et al. 2015). Raats *et al* (2015) found that providing different portion size information influenced the interpretation of the healthfulness of products (Raats MM, Hieke S et al. 2015). Participants in my study seemed aware that manufacturers might use the provision of portion size information to present less healthy products in the most positive manner and suggested that the uncertainty around portion size information increased their difficulty in interpreting the FOP nutrition information panel.

vii) Summary

Most participants did not attend to the FOP nutrition information panel during their routine shop. For some, this was because factors other than nutrition-related health were afforded a greater priority. Some simply failed to notice it and others were distracted by other information on the front of pack. Involvement in the study seemed to raise awareness and increased participants' willingness to try to use the FOP nutrition information panel in the future. This suggests that the mere presence of the FOP nutrition information panel is not sufficient, by itself, for it to be noticed or considered by shoppers without a specific nutrition/health related goal. Raising awareness about the importance of eating for health,

and the role that the FOP nutrition information panel can play in helping shoppers to make healthy food selections, seems to be an important pre-requisite to increasing the attention given to it by shoppers.

The FOP nutrition information panel could offer support to shoppers but its presence is currently overwhelmed by commercially driven factors which participants did not generally resist. Perhaps it is unrealistic to expect that individual consumers should be successfully able to make consistently healthy choices in an environment designed to make unhealthy choices easy. Alongside FOP nutrition labels, working to increase the visibility and promotion of healthy products within supermarkets will be needed to encourage more shoppers to consider making healthy choices.

This research confirms some common findings reported in the literature. Those who did use the information spent only a short time examining the label before making their choice, but some decisions were more considered - for example, when a new product was being selected or a comparison was being made between two different products. A useful approach might be to encourage consumers to consider specifically using the FOP nutrition information panel to inform their choice on these occasions rather than expecting them to use it for each decision. The likelihood that consumers' view (and judge) different product categories differently increases the complexity of encouraging the use of the FOP nutrition information panel. Tailoring use messages at product specific level may help to increase the saliency of the message for some shoppers.

It appears that shoppers need to be interested in making healthy choices and be sufficiently informed and motivated to spend time considering the information provided on the FOP nutrition information panel. While some participants could correctly interpret and use the FOP nutrition information panel, others reported being confused by different label formats and several misunderstood different elements provided within the panel. A consistently applied label format across supermarkets is likely to enable more shoppers to engage with

the information. The different elements within the UK hybrid format label appear, potentially, to meet the needs of a wide range of consumers. Shoppers seem to need further assistance in understanding and recalling appropriate benchmarks to help them to interpret the label information. Of particular value might be guidance to help shoppers to develop more accurate label reading heuristics to enable them to place individual food choices in the context of their total dietary intake.

Adams *et al* (2016) characterise FOP nutrition labelling as a high-agency population based intervention, because using the nutrition label requires the mobilization of significant 'agency' or personal resources (including, for example, health literacy, time, motivation and nutrition knowledge). The authors suggest that such interventions *"are likely to be less effective, overall, than those that require less agency"* and may exacerbate social inequity because engagement with this type of intervention is likely to be socially patterned (Adams J, Mytton O et al. 2016). Further research is urgently required to explore the role and impact of nutrition label use amongst those with limited health 'agency', with consideration being given to whether nutrition labels might potentially exacerbate the health inequity experienced by the most vulnerable population groups. Similarly, an important research gap exists specifically in relation to nutrition label use in people with limited health literacy - defined as *"the cognitive and social skills that determine the motivation of individuals (and populations) to gain access to, understand and use information in ways that promote and maintain good health"* (Kickbusch 2001) - who are likely to be at risk of experiencing poorer health (Rowlands G, Khazaezadeh N et al. 2013). The development of a UK specific screening tool to assess health literacy skills which uses nutrition label information could help to contribute to progress in addressing this gap in understanding (Rowlands G, Khazaezadeh N et al. 2013).

8.3.3 Comparing the different data capture methods

i) The impact of the data capture method on recall of purchasing decisions

Specifically, my study set out to investigate whether using wearable cameras might help researchers to understand how shoppers recall and articulate their use of the FOP nutrition information panel during their routine shop compared to using a 'Think aloud' method. The two types of method act in distinct ways. The 'Think aloud' shop requires participants to articulate their thoughts as the selection of a product is being considered. In their meta-analysis Fox *et al* (2011) reported that while concurrent verbal reporting ('Think aloud') increased the time required to complete a task it also produced a reliable report of the sequence of thoughts during task performance (Fox MC, Ericsson KA et al. 2011). Nielsen *et al* (2002) describe Ericsson and Simon's rationale for 'Think aloud' as a means of verbalising the content of the short term memory, arguing that delayed recall resulted in descriptions and explanations rather than a report of immediate thoughts (Nielsen J, Clemmensen T et al. 2002).

The camera-wearing participants were required to recall their decision making process retrospectively on viewing their images after their shop had been completed. Viewing images of previous experiences has been shown to aid recall of normal events, with researchers postulating that recall is stimulated because the images produced by wearable devices are close to the nature of visual autobiographical memories (Hodges S, Williams L et al. 2006, Sellen AJ, Fogg A et al. 2007, Gemming L, Doherty A et al. 2013). Others have found that viewing images helped participants to return to an experience, prompted a discussion of thoughts at the time, facilitated sharing of background context, see things they had missed and provided evidence to support their explanation (Fleck R and Fitzpatrick G 2009). Wearable cameras have previously been found to be useful in assessing eating patterns (Chen J, Marshall SJ et al. 2013) and in dietary assessment (Gemming L, Doherty A et al. 2013, O'Loughlin G, Cullen SJ et al. 2013).

Despite the difference in approach between the two methods (with 'Think aloud' capturing concurrent data and viewing wearable camera images collecting data retrospectively), both appear to have been useful mechanisms to generate information relating to the general factors which were reported to influence the purchasing decisions of participants. However, neither the 'Think aloud' shop nor viewing images as prompts seemed to capture data relating to the FOP nutrition information panel. This might be a reflection of the lack of priority participants appeared to give to health and nutrition-related health during their purchasing decisions and the limited use of the FOP nutrition information panel which was observed. It also points to the lack of saliency given by the participants to the FOP nutrition information panel – data about its use (or potential use) was only generated following specific researcher intervention during the post-shop interview.

Considering the wearable camera images alone, a significant quantity of Autographer data was 'lost' to analysis as it showed unusable (blurred or unclear) images or showed 'walk-through' or 'facing shelf/single shot' images. Similarly, data was lost from the Tobii images as 'walk through/glancing' images could not be analysed further. Manual coding of these (and other usable) images was time consuming and we (and others) have suggested that this is unfeasible in larger scale studies (Barr M, Signal L et al. 2013, Cowburn G, Matthews A et al. 2015). In their pilot supermarket based eye-tracking study, Rawson *et al* (2008) also suggests that the time spent on analysis would make the method difficult to use at scale (Rawson D, Janes I et al. 2008). The development of automated image analysis may assist with reducing the burden of image analysis but still requires further technological improvements, particularly in relation to the analysis of food-related data (Doherty AR, Hodges SE et al. 2013, Sun M, Burke LE et al. 2015).

Both the Autographer and the Tobii eye-tracking glasses were found to be useful tools in identifying episodes of browsing and choosing which participants undertook during their supermarket shop. As more of the Tobii images could be coded in this way, this resulted in more images being available for analysis when the Tobii eye-tracking glasses were used as

the data capture method. One explanation for fewer Autographer images being available for analysis is the speed of data capture. The Tobii eye-tracking glasses continuously capture data, and playback appears as a continuous set of images, whereas the Autographer captured an image every 13-14 seconds. Given that it seems that shoppers spend between 6-35 seconds looking at a product before selection (Grunert KG, Fernández-Celemín L et al. 2010, Sutherland LA, Kaley LA et al. 2010, Royal Society for Public Health 2016), this suggests that the Autographer's speed of operation may be too slow to capture some decision making. Other studies have reported that slow image capture has resulted in missed episodes (Gemming L, Doherty A et al. 2013, Cowburn G, Matthews A et al. 2015). In my study the inaccurate identification of products, misclassification of product comparisons and a lack of clarity about whether items which were handled counted as a purchase or non-purchase were found. These findings confirm our previous research which reported that similar coding errors are likely to occur when Autographer-type camera images are viewed in isolation (Cowburn G, Matthews A et al. 2015). It was impossible to gather direct data about whether or not participants looked at the FOP nutrition information panel from the Autographer images. The images seem to offer a starting point for a discussion with participants about the rationale for their product selection (including their nutrition label use) rather than providing this information directly in the image data.

Although the Tobii eye-tracking glasses data did not provide direct information about the rationale for purchase decisions, the images were more straightforward to code (because of their continuous nature) and it was possible to gather information about the attention given by participants to the FOP nutrition information panel. However, the images only record attention and cannot collect data relating to understanding or use of the FOP nutrition information panel. The images were most useful in providing an opportunity for further discussion and elaboration during the interview. Rawson *et al* (2008) reported on a pilot eye-tracking study based in a supermarket which aimed to test the feasibility of eye-tracking as a method for food labelling research. Twelve participants were asked to complete specific

shopping tasks and then watched a playback of their eye-tracking images, took part in an interview and completed a questionnaire about their experience. The researchers found that eye-tracking images could identify whether attention was paid to different parts of the packaging but very detailed information could not be clearly discerned. Those given a specific goal (to purchase a breakfast cereal suitable to someone with a nut allergy, a soup/sauce suitable for microwaving and a yoghurt containing real fruit pieces) were most likely to give more attention to the food labelling whereas other participants (who had been given a general task to purchase a cereal, a soup/sauce and a yoghurt different to the one they would normally choose) appeared to use 'less effortful' ways to make a choice than examining the label. Rawson *et al* (2008) found that participants found using the technology acceptable but also reported that the eye-tracking data alone was insufficient to provide any contextual understanding of why decisions had been made (Rawson D, Janes I et al. 2008). Data using the Tobii eye-tracking glasses was only collected from five participants but the use of this device seems to offer a promising way forward to investigate specific detail about the attention given to the FOP nutrition information panel in store, once technological advances improve its practical application.

The post-shop interview data turned out to be the primary source of information about label use from participants, a finding which I had not anticipated for this study. However, the importance of interviews as a data source is supported by other research. In our wearable camera study with adolescent users, we found that a combination of data collection methods (food records, wearable camera images and interview data) offered a greater insight into the food and drink purchasing opportunities which teenagers were exposed to on their journeys to and from school. In particular, viewing images prompted an opportunity for a detailed discussion and produced valuable, contextually specific information (Cowburn G, Matthews A et al. 2015). Nielsen *et al* (2002) reported that understanding the rationale behind decision making frequently came from the 'Think-After', the interview which followed the 'Think aloud' (Nielsen J, Clemmensen T et al. 2002). Bryne *et al* (2008) tested wearable cameras as a

tool for aiding task observation in understanding the information accessing processes used by a group of Finnish scientists. They found that the captured images alone were most useful in providing what the authors termed a ‘‘gisting’ or high level overview’ of the tasks involved but were less effective at uncovering task specific, detailed information (Byrne D, Doherty A et al. 2008). Similar findings about the general nature of eye-tracking image data have also been reported (Rawson D, Janes I et al. 2008).

ii) Reactivity and the data capture methods

Part of the rationale for the current study was to consider how the use of the ‘Think aloud’ method and wearable cameras as data capture methods might be affected by reactivity, where participants change their behaviour towards conformity and social desirability because they are being observed (McCambridge J, Witton J et al. 2014). The ‘Think aloud’ method is a direct observation method in contrast to wearable cameras which are classified as a non-direct method of observation. Research has found that ‘Think aloud’ reports contain interactive and social features, suggesting that they might be open to observer effects (Sasaki T 2008). It has been argued that the passive nature of image collection by the wearable cameras might reduce reactivity by being a less intrusive method of data capture than a direct observation method like using ‘Think aloud’ (Nguyen D, Marcu G et al. 2009, Sun M, Burke LE et al. 2015). This study did not set out to directly assess whether participants taking part in the ‘Think aloud’ shop reported their ‘actual’ thinking or instead what they were prepared to disclose during the process. Similarly, there is a possibility that camera-wearing participants found being presented with images of their own shopping behaviour to be more, rather than less, intrusive because the images provide some evidence of actual behaviour rather than behaviour which participants might have felt more comfortable to report. However this was not evident from the data. The findings suggest that participants found all of the data collection methods to be acceptable. Some participants reported feeling self-conscious when they started their shop but this was consistent across all three methods of data capture. While participants were aware that there was potential for

them to change their behaviour as they took part in the study, some specifically reported deciding to shop 'normally'. Participants were recruited into the study having been informed that the research was interested in 'exploring decisions made during routine supermarket shopping' and most of the participants were asked to use the FOP nutrition information panel before they started their shop. If participants had been strongly cued by this information to amend their behaviour, it would be reasonable to expect to have seen more evidence of use of the FOP nutrition information panel amongst participants than was found. The limited attention and interest shown by the participants in nutrition-related health and specifically in the FOP nutrition information panel suggests that their behaviour was not particularly affected and that, as they reported, the shop which they undertook for the study was 'typical' of their normal shopping behaviour. There was some evidence that shoppers who originally expressed interest in taking part in the study decided not to participate having considered how data would be collected, suggesting that they may have reacted negatively to being observed, directly or non-directly. We found similar concerns during recruitment in our wearable camera study with teenagers (Cowburn G, Matthews A et al. 2015). It may be that once participants have self-selected themselves to take part in a study of this kind, they are fully prepared to contribute. The findings make it plausible to suggest that once they were immersed in the 'busy' supermarket environment, participants became absorbed in the familiar task of shopping and were less aware of being observed.

8.4 Strengths and limitations

8.4.1 Study strengths

A key strength of the study is the setting in which the data were gathered. In the nutrition labelling literature, there has been a consistent and strong call for research to take place in 'real life' settings rather than in an experimental or laboratory based context (Cowburn G and Stockley L 2005, Grunert KG and Wills JM 2007, Hawley KL, Roberto CA et al. 2012, Hieke S and Taylor CR 2012). Very little labelling research has been attempted in the environment

in which it has been designed to be used, at point-of-choice in a retail environment (Hersey JC, Wohlgenan KC et al. 2013). Participants were also asked to undertake their own shopping, for which they were expected to pay, as I hoped to encourage participants to consider and make genuine choices during their shop. This was a deliberate decision imposed to address a concern that, as is common in labelling research, researchers imposing a 'healthy choice' task might influence the decision-making processes under study.

Information provided to participants was kept to a minimum until after data collection was complete so that participants would behave naturally during their shop. This decision received ethics committee consent on the condition that a participant debriefing sheet (which clarified the rationale for the study and offered participants the opportunity to opt out after data collection was completed, previously referred to in Appendix 16) was devised and used. Permission to use this approach facilitated the collection of naturalistic data but as previous labelling research suggested that actual labelling use was infrequent, it ran the risk of failing to capture any use of the FOP nutrition panel. In light of this, I decided to ask some of the participants to try to use the FOP nutrition information panel prior to their shop. As a consequence, although the attention paid to the FOP nutrition panel by participants turned out to be limited, there was - at least - some data to be assessed.

Using the Tobii eye-tracking glasses provided objective data showing participants - albeit limited – attention to the FOP nutrition panel. To my knowledge, assessing the feasibility of wearable camera devices to explore label use in a retail setting has previously been piloted in only one UK study. Rawson *et al* (2008) also used eye-tracking technology with a small number of participants but the focus of their study was on general label use rather than specifically addressing the use of the FOP nutrition information panel, making my study unique (Rawson D, Janes I et al. 2008).

Following participants shopping trip with a post-shop interview also turned out to be a key strength of the study. If I had relied on data gathered from the 'Think aloud' shop and/or the

wearable camera images alone, little data would have been captured which related directly to the use of the FOP nutrition information panel. Using a variety of data capture tools – and using product prompts and specifically focused direct questions - resulted in the collection of a combination of rich data which has provided useful findings which could offer new avenues for future research. This study confirms the importance of collecting interview data to gather contextual and explanatory data as wearable camera images are being viewed by participants (Cowburn G, Matthews A et al. 2015).

8.4.2 Study limitations

A range of different methods were used to recruit participants to the study. However, it was difficult to garner the interest of shoppers who were being asked to make a relatively significant time commitment to help in the research. The profile of participants who agreed to take part is similar to enthusiastic individuals who typically volunteer to take part in this type of research (Baltas G 2001, Cowburn G and Stockley L 2005, Drichoutis AC, Lazaridis P et al. 2006, Grunert KG and Wills JM 2007, Grunert KG, Fernández-Celemín L et al. 2010, Campos S, Doxey J et al. 2011, Hieke S and Taylor CR 2012, Storcksdieck genannt Bonsmann S and Wills JM 2012, Christoph M, An R et al. 2015). The findings from this study thus reflect the shopping choices, views, experiences and thoughts of this particular group of participants. Although I aimed for a maximum variation sample, resource and practical issues meant that the recruited sample most realistically reflects ‘all-comer’ volunteers. As such, the study is unable to provide information about the label use practices of a wider group of shoppers, those living in vulnerable circumstances or consumers with diverse ethnic backgrounds. This study offers an insight into the ‘real-life’ use of the FOP nutrition information panel within a supermarket setting but further research is needed to ascertain whether the findings of this study would be replicated amongst different groups of shoppers. Similarly, this study cannot provide insight into whether and how consumers engage with FOP nutrition information in other contexts – at home or in other point-of-choice food purchasing contexts (for example, during internet supermarket purchasing or when food is

purchased from catering outlets). Malam *et al* (2009) found little reported used of nutrition labelling at home (Malam S, Clegg S et al. 2009) and Benn *et al* (2015) found that little attention was given by consumers to nutritional information during on-line product selection (Benn Y, Webb TL et al. 2015). Although consumers have expressed interest in seeing nutritional information on food provided by catering outlets (Mackison D, Wrieden WL et al. 2009), little is currently known about the most appropriate means by which to display this information or about whether or not it would be used by consumers in practice.

Partly as a result of difficulties in recruitment and also due to other practical considerations, it became unfeasible to continue to recruit further shoppers beyond September 2014. The number of participants who were successfully recruited to take part in the study raises the issue of whether this small sample is a sufficient sample to enable data saturation to be achieved. The number of participants considered to be sufficient is a contested issue in qualitative research with a majority view reported as *"it depends… on the theoretical perspective, the research context and practicalities"* (Baker SE and Edwards R 2012) and other authors citing numbers of between 6-50 participants as guidelines for sufficiency (Guest G, Bunce A et al. 2006, Mason M 2010). Morse (2000) and others have argued that the number of participants required to reach saturation is influenced by a range of factors (Morse J 2000, Charmaz K 2006, Ritchie J, Lewis J et al. 2013). Morse suggested that these included the scope of the study, the nature of the topic and the quality of data obtained from participants, where she postulated that having a narrow, well defined scope which covered an unambiguous topic area and which generated clear and usable data reduced the number of participants needed to achieve data saturation (Morse J 2000). I believe that the data collected from participants for this study meets Morse's criteria and suggests that the number of participants from which data was collected would, in principle, enable data saturation to be reached.

Morse's earlier work contended that richness of data depends on the depth and detail of information elicited not on the frequency with which it is encountered. She suggested that

data saturation can be said to have been achieved when data analysis initially seeks to find variation of description until such time as repetition of descriptions is found. This replication of descriptions indicates that no new information is being encountered and a theme can be deemed to be saturated (Morse J 1995). As my analysis progressed through successive transcripts, I stopped hearing new themes and so ceased adding new codes. This led me to be able to develop a detailed picture of a range of perspectives and experiences, alongside a set of full and consistent insights, which points towards the achievement of data saturation. Hennink *et al* (2016) have suggested that a useful differentiation should be made between 'code saturation', when a range of thematic issues have been identified, and 'meaning saturation', where researchers have a rich understanding of the issues (Hennink MM, Kaiser BN et al. 2016). According to these definitions, I am confident that data saturation was achieved. Demonstrating that a rigorous face value and interpretive approach has been used in the study is also challenging, particularly as the data analysis was undertaken by one researcher (Tracy SJ 2010). The transcripts of the post-shop interviews, and the subsequent selection of illustrative quotations used in the thesis, show that data were checked to ensure that clarity of meaning and a shared understanding of the perspective of different participants was achieved.

As the researcher solely responsible for data analyses, I am responsible for the findings which have emerged from the data, which will have been influenced by my prior experience and expectations (Finlay L 2002). As such, it is possible that other researchers would have drawn out different findings from those which are presented here and input from other researchers during the analyses may have helped to challenge, strengthen or confirm the interpretations which I have made. However, in qualitative research, considerable importance is placed on the contextual and interpersonal insight which can be brought to interpretation when analyses are conducted by the individual who collected the data, with less emphasis given to duplication and replication of results (Morse JM 1997).

Data was successfully gathered from the post-shop questionnaire which was useful in characterising the nature of participants who took part in the study. Most participants were able to complete all of the questionnaire items without assistance, suggesting that the questionnaire was straightforward to use. However, although questions used within the questionnaire have previously been used for similar research purposes, the post-shop questionnaire was created specifically for use in this study. As such, it is a modified, non-validated questionnaire and specific findings taken from the questionnaire should be interpreted with caution as its reliability and validity has not been ascertained (Boynton PM and Greenhalgh T 2004).

As the method for scoring the Leeds SFFFQ items in the post-shop questionnaire was not publically available when I completed my analysis, I had to create my own diet quality score. Although this scoring system was verified by another experienced nutritionist, it is possible that the scores allocated using my diet quality score might differ from the scores which would have been given if the Leeds SFFFQ scoring system had been used. Following publication of the Leeds SFFFQ scoring system (Cleghorn CL, Harrison RA et al. 2016), I recalculated the participant scores relating to three specific diet elements (fruit, vegetables and oily fish) to compare my own diet quality score with the Leeds scoring system. Although one participant was scored more conservatively by my method, there was generally good agreement on the categorisation of participants between the two scoring methods, as assessed on these three components. This suggests that both diet quality scores would have identified the participants in the study as reporting moderate to healthy typical dietary patterns.

Although data collection took place in two stores, a limitation of the study is that both stores were part of one supermarket chain. It could be that consumers who shop at other supermarket chains adopt different approaches to using the FOP nutrition information panel, although most of the study participants did also report shopping in other supermarkets. The shoppers who took part mostly did so by undertaking a ‘top-up’ type shop so this study

cannot offer evidence about how use of the FOP nutrition information panel is affected when shoppers are selecting for a larger style shop or in stores which offer a wider selection of products than the convenience-style stores in which data were collected.

Collecting data from participants directly following on from their shop resulted in the capture of their immediate reflections on their recent experience but the location of data collection (within a screened off area within the store) may have impacted on the nature of the data collected. Although the space was relatively enclosed, some participants may have restricted their responses to issues they were comfortable to disclose within a public space, although most appeared to talk freely during the interview. Similar research in future might need to consider the trade-off between collecting data in the context where shopping decisions are taken compared to potential gains which might be offered by interviewing participants in more private surroundings, for example, at home.

Collecting data using the Autographer was more straightforward and less research-intensive than using the Tobii eye-tracking glasses (and the devices are considerably more affordable research tools) but the infrequency of image capture during their shop was a major limitation in this study. Attempting to use these types of device to collect detailed and specific information may be beyond their technical reach in their current form. Experience in this study suggests that the use of Autographer in retail settings should be limited to gathering data on general shopping-related issues until the devices are enabled to speed up the rate of image capture. The Tobii eye-tracking glasses show more potential as a useful tool in collecting information relating to attention paid to the FOP nutrition information panel but I did not find them straightforward to use in practice and they are likely to be too costly to be considered for use for most non-commercial research.

8.5 Contribution to the evidence base

This study makes an innovative contribution to the evidence base in two ways. Firstly, it has explored the factors which influence the purchasing decisions that shoppers make and

identified whether and how they use the FOP nutrition information panel when they are undertaking 'real-life' shopping in an typical retail environment. This has been identified as a significant research gap in the literature and this study takes the first step to address this. Secondly, this is the first study to assess whether wearable camera devices could feasibly be used as a research tool to understand how shoppers use the FOP nutrition information panel in a retail setting.

8.6 Recommendations

The findings from this study can be used to inform the future development of the FOP nutrition information panel and a series of recommendations are made to a range of stakeholders.

Policy makers

- Work towards creating a food retail environment which aims to provide equal opportunities for healthy food to be promoted and visible to consumers

This study confirms that consideration of issues relating to health and nutrition is given a lower priority than other factors when food choices are being made in a retail environment where commercially driven factors overwhelmingly promote less healthy choices. Working to increase the visibility and promotion of healthy products within supermarkets will be needed to assist and encourage shoppers to consider making healthy choices.

- Consider a mandatory format for the FOP nutrition information panel

An important finding from this research is confirmation that – in real-life settings – shoppers report being confused and alienated by the presence of different FOP nutrition labelling formats. The supermarket environment is designed to offer a plethora of choices and the voluntary nature of existing guidance on FOP nutrition label formats allows for deliberate obscuration of the nutritional content of products. Working towards a

mandatory format for the FOP nutrition information panel would help to reduce shopper confusion and facilitate engagement with a single format.

- Fund formative evaluation to inform the development of future FOP nutrition label use campaigns and interventions

A key problem with existing FOP label information identified by this study is the lack of attention which it is given by shoppers. Formative evaluation work is required to understand how to engage shoppers with nutrition and health related issues and to help them to make use of the guidance which the FOP nutrition information panel can offer in supporting them to make healthy choices when they shop. Future attempts to engage consumers in using the label should be subject to rigorous evaluation so that more can be learned about how shoppers might be encouraged to attend to this information and motivated in its use.

Researchers

- Assess the FOP nutrition information label use of shoppers in a wide range of supermarkets and store types

Although my study has made a valuable start to address the gap in knowledge which has been consistently reported in the literature, very little is still known about how a wide range of shoppers use the FOP nutrition information panel in real life settings. Replicating studies of this type in different supermarket chains and store types and with a wider variety of shoppers would increase our knowledge of the circumstances in which nutrition label use could be most encouraged.

- Understand more about how label users trade off different elements within the label

My study did observe some examples of shoppers using the FOP nutrition information panel to guide their choice. However, further exploration of the specific heuristic

processes which label readers use could help to guide the development of focused nutrition education materials which would encourage its use.

- Understand the impact and influence of possible ‘halo effect’ of using the FOP nutrition information panel

The findings from this study hint that shoppers might use their understanding of the value of a single nutrient as a means to evaluate the nutritional content of the whole product. Further research is needed to understand this phenomenon, to address its possible impact and to consider ways to encourage shoppers to more accurately interpret the nutritional information provided on pack in the context of their total diet.

- Undertake research which considers how to amplify the use of the FOP nutrition information panel in real-life contexts

My research has demonstrated the value in exploring how consumers behave in their usual shopping environment. Understanding and assessing the effectiveness of real-life interventions designed to encourage the use of the FOP nutrition information panel and investigating its impact on diet quality should be research priorities.

- Assess the impact of the FOP nutrition information panel on the reformulation of specific food categories

The presence of the FOP nutrition information panel has been considered important as a means of encouraging manufacturers and retailers to reformulate their products to gain a more ‘healthy’ label. However, little is known about the impact of nutrition labelling on the reformulation of foods so independent monitoring and assessment is required to assess its impact over time.

- Use wearable camera devices and ‘Think aloud’ shop methods to investigate general issues relating to decision making during shopping

The findings of this study suggest that data collected during a 'Think aloud' shop and from wearable camera images alone can be useful methods by which to understand general issues which relate to decision making during food shopping and using eye-tracker technology might provide objective evidence of FOP nutrition information panel use. Wearable camera data are greatly strengthened by the use of post-shop interviews, as interviews appear to be a useful method to generate further specific and important contextual information relating to the use of the FOP nutrition information panel.

Retailers

- Tailor FOP label reading education efforts to when users are most likely to use labels

This study suggests that FOP nutrition label use is more likely when shoppers are considering new products or during product comparisons within category. Focusing FOP label reading information to encourage its use at these times or when shoppers report finding it most difficult to interpret (to understand portion size, for example) rather than providing general advice on using nutrition information to guide every choice might increase the saliency of the advice for consumers.

- Offer in store activities to promote and highlight the value of the FOP nutrition information panel

The use of the FOP nutrition information by shoppers could be amplified if retailers offered in-store activities (such as banners, posters, shelf-tags, till-point information) which promote and highlight its presence and the benefits of use.

8.7 Conclusion

This study has provided new information on the use of the FOP nutrition information panel in routine shopping. The retail context for the use of this information is known to be designed to offer a multitude of product choices, many of which make little contribution towards a healthy diet. While the FOP nutrition information panel might - potentially - make a valuable

contribution in assisting shoppers to consider making a healthy choice, other more broadly based public health nutrition interventions (such as fiscal or legislative measures) are likely to offer more promise in achieving significant population health gain. The results confirm the findings of other research conducted outside of a retail setting and suggest that using the FOP nutrition information panel to aid purchasing decisions is not given high priority by those shoppers without specific health or nutrition-related purchasing goals. Providing nutrition information on pack is important for consumer protection and the FOP nutrition information panel appears to offer potential to encourage the consideration of nutrition during food choice. It currently seems to fail to engage some shoppers sufficiently to enable them to use it to guide their food selection at point-of-choice. As such, the study findings hint at possible explanations for the limited impact of nutrition labelling on improving the healthiness of food purchases and dietary behaviour which has been found in the literature. The findings also suggest that merely providing nutrition labelling on the front of pack with the expectation that this will be sufficient to engage the attention of consumers is unlikely to be a successful approach. Future nutrition education interventions need to not only encourage an increased use of the FOP nutrition information panel by helping shoppers consider the importance of a healthy diet, but also to raise awareness of the presence of nutrition information on pack and provide clear explanations of how the FOP nutrition information panel can be used in different circumstances to guide their choice. Only then might shoppers be more prepared and able to correctly interpret the information provided and so more accurately assess the nutritional content of products as part of their decision making.

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APPENDICES

Table of Contents

Number	Title	Page
Appendix 1	'Think aloud' protocol for researchers	222
Appendix 1.1	'Think aloud' training practice materials,Toaster	224
Appendix 1.2	'Think aloud' training practice materials, Kettle	225
Appendix 1.3	'Think aloud' training practice materials, Iron	226
Appendix 2	Ethics approval letter	227
Appendix 3	Recruitment poster/flyer	228
Appendix 4	Study information sheet	229
Appendix 5	Participant consent form	232
Appendix 6	Non-participation questionnaire	233
Appendix 7	Autographer camera protocol for researchers	234
Appendix 8	Tobii eye-tracking glasses protocol for researchers	235
Appendix 8.1	Tobii eye-tracking glasses calibration protocol for researchers	236
Appendix 9	Safe use of wearable cameras – protocol for researchers	237
Appendix 10	Examples of the format of FOP nutrition information panel used in study stores	238
Appendix 11	Post-shop questionnaire	239
Appendix 12	Leeds short form food frequency questionnaire permission for use	251
Appendix 13	Product prompt selection protocol	252
Appendix 14	Post-shop interview schedule	253
Appendix 15	Wearable camera image interview protocol	257
Appendix 16	Participant debriefing information sheet	258
Appendix 17	Summary coding framework	259
Appendix 18	Wearable image coding: 'episode' descriptions (Autographer)	261
Appendix 19	Wearable image coding: 'episode' descriptions (Tobii eye-tracking glasses)	262

Appendix 1 – 'Think aloud' protocol for researchers

1. Consent form check - is it signed? Ask participant:

   "are you happy that you have read and understood the information sheet?"

   "any further questions?"

2. Overview of today's task:

   Think aloud training
   Shopping – remind them it is their shop and they are paying
   Post shop – questionnaire, record of purchases, interview

3. Ask:

   "what size of shop are you doing today?"
   "how long do you think your shop will take?"
   "you'll remember that after you've finished your shopping we'd like you to talk to me which will take about one hour - is that still ok?" [If yes - continue, if no – rebook]
   "do you need to leave by a particular time?"

4. **'Think-Aloud' Training**

   "As I have probably already mentioned… in this task I would like you to think aloud while you are doing your shopping. What I mean by thinking out loud is to say everything you are thinking while you are shopping. So maybe this will be what you are looking at, reasons why you are choosing to buy it, or reasons why you aren't buying it and so on…

   When I say 'everything you're thinking' I mean just that, no matter how fleeting or trivial the thoughts may be. That means including everything that you're looking at and registering mentally, as well as anything you're doing.

   The idea is that you continue talking as much as possible about what you are thinking, rather than you and I having a conversation, so you will find that I will follow you and observe what you are doing, but not talk a lot to you. When you are talking out loud it's fine to aim what you are saying to me so you feel you aren't talking to yourself!

   I have a few practice examples here as it can help to get used to talking out loud…I will demonstrate the first example, then if you happy to have a go you can try the following example. It is also really useful if you mention what in particular you are looking at, for the benefit of the tape recording.

   So I'll start now with an example of how I might think aloud if I was trying to buy a toaster out of a catalogue. "I am looking at the Cookworks toaster, it's 6.99 – so it seems nice and cheap and it toasts 2 slices of bread. But then there's this Waring one which is 39.99, much more expensive but it toasts 4 slices of bread. Although I prefer the look of this one as it's silver and red and I don't really need the toaster to toast 4 slices of bread and I don't really want to spend too much, so I think I'll choose the cheaper one."

   Could you now do the same as though you wanted to buy a kettle and you were choosing between these four. Would you like to have go at talking out loud about these irons too?"

5. **Instructions for the shop:**

   "Carry out your shopping in your usual way. Don't rush on my account. It may feel

strange to have me following you around.

Think aloud at all times

I will prompt you if you fall silent for more than a short time and I will probably say: 'Keep thinking aloud'; or 'What are you thinking'; or 'What are you looking at?' but I won't have a conversation with you.

I may make some notes during the shop, please don't be put off by this. It's just to help me remember things.

Finally, I'm not here to judge what you buy."

"Any more questions before we start?"

6. Set up recording equipment and clip the microphone to lapel/collar. Say

   "the recorder will be on throughout the shop and will pick up both of our voices."

7. Start recording equipment and say Participant ID number

8. After shop has been completed say:

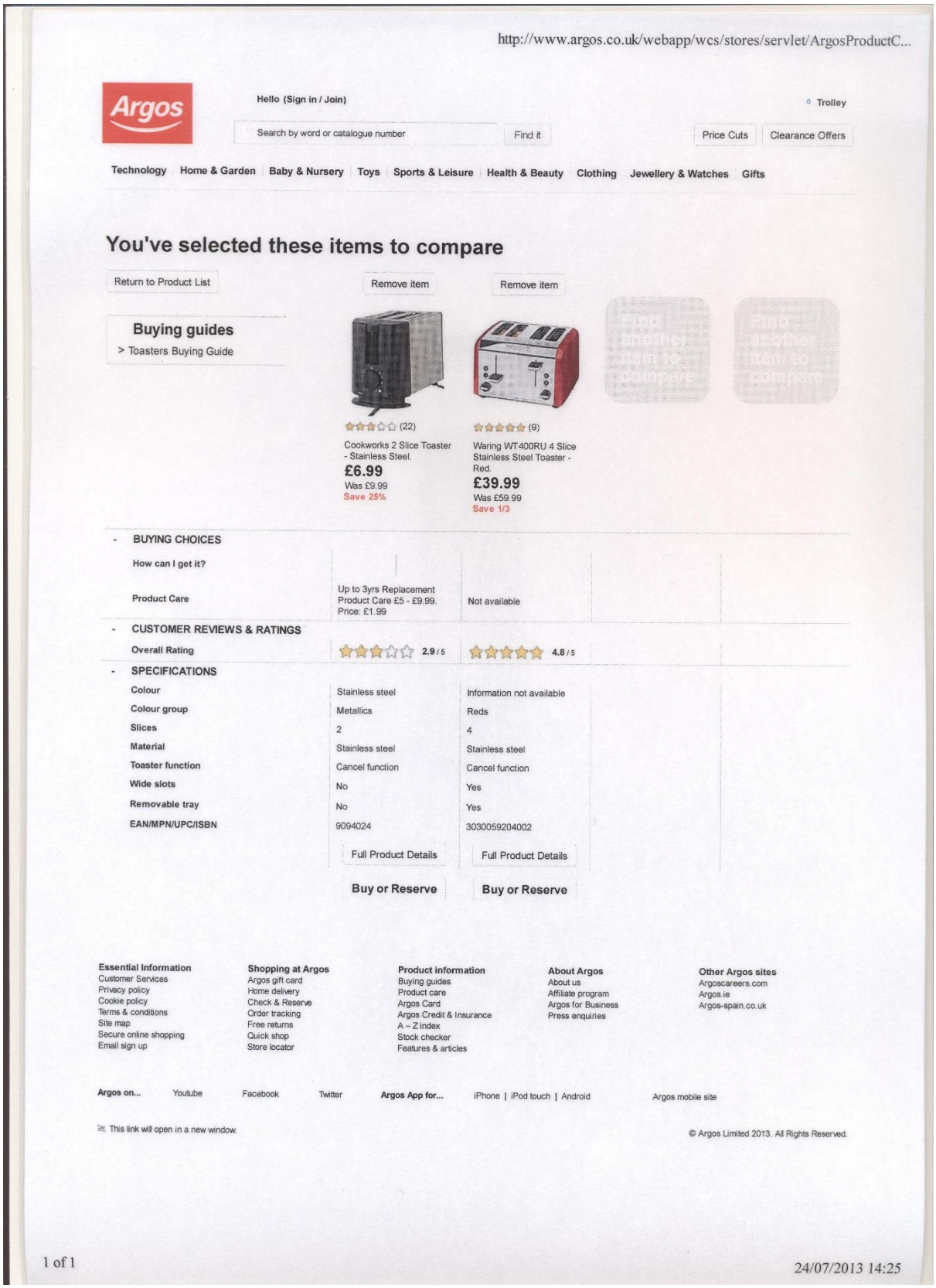
   "We have now finished - I'll turn off the recorder before we reach the tills."

   "Anything you want to say before I turn it off?" "Thank you"

9. *"We'd only like to talk to you about some of the products you've chosen today – the prepacked ones - would you like me to help pack your shopping so we can pack those items separately to speed things up a bit or would you rather pack your own?"*

   Take participant to area for post shop activities

Appendix 1.1 - ‘Think aloud’ training practice materials, Toaster



http://www.argos.co.uk/webapp/wcs/stores/servlet/ArgosProductC...

Argos

Hello (Sign in / Join)

Trolley

Search by word or catalogue number

Find it

Price Cuts | Clearance Offers

Technology | Home & Garden | Baby & Nursery | Toys | Sports & Leisure | Health & Beauty | Clothing | Jewellery & Watches | Gifts

You've selected these items to compare

Return to Product List

Remove item

Remove item

Find another item to compare

Find another item to compare

Buying guides

> Toasters Buying Guide

(22)

Cookworks 2 Slice Toaster - Stainless Steel.

£6.99

Was £9.99

Save 25%

(9)

Waring WT400RU 4 Slice Stainless Steel Toaster - Red.

£39.99

Was £59.99

Save 1/3

-	**BUYING CHOICES**			
	How can I get it?			
	Product Care	Up to 3yrs Replacement Product Care £5 - £9.99. Price: £1.99	Not available	
-	**CUSTOMER REVIEWS & RATINGS**			
	Overall Rating	2.9 / 5	4.8 / 5	
-	**SPECIFICATIONS**			
	Colour	Stainless steel	Information not available	
	Colour group	Metallics	Reds	
	Slices	2	4	
	Material	Stainless steel	Stainless steel	
	Toaster function	Cancel function	Cancel function	
	Wide slots	No	Yes	
	Removable tray	No	Yes	
	EAN/MPN/UPC/ISBN	9094024	3030059204002	
		Full Product Details	Full Product Details	
		Buy or Reserve	Buy or Reserve	

Essential Information
Customer Services
Privacy policy
Cookie policy
Terms & conditions
Site map
Secure online shopping
Email sign up

Shopping at Argos
Argos gift card
Home delivery
Check & Reserve
Order tracking
Free returns
Quick shop
Store locator

Product information
Buying guides
Product care
Argos Card
Argos Credit & Insurance
A – Z index
Stock checker
Features & articles

About Argos
About us
Affiliate program
Argos for Business
Press enquiries

Other Argos sites
Argoscareers.com
Argos.ie
Argos-spain.co.uk

Argos on... Youtube | Facebook | Twitter

Argos App for... iPhone | iPod touch | Android

Argos mobile site

This link will open in a new window.

1 of 1

24/07/2013 14:25

Appendix 1.2 - ‘Think aloud’ training practice materials, Kettle

http://www.argos.co.uk/webapp/wcs/stores/servlet/ArgosProductC...

Argos

Hello (Sign in / Join)

Trolley

Search by word or catalogue number

Find it

Price Cuts | Clearance Offers

Technology | Home & Garden | Baby & Nursery | Toys | Sports & Leisure | Health & Beauty | Clothing | Jewellery & Watches | Gifts

You've selected these items to compare

Return to Product List

	Remove item	Remove item	Remove item	Remove item
	(99)	(2)	(10)	(25)
	Morphy Richards Brita Filter Kettle - Black.	Waring Jug Kettle.	ColourMatch Plastic Jug Kettle - Funky Fuchsia.	Breville IKJ796 Jug Kettle - Polished Stainless Steel.
	£24.99	£59.50	£6.99	£18.99
	Was £49.99	+ Free Delivery	Was £14.99	Was £39.99
	Half Price		Half Price	Less Than Half Price
			+ 1 special offer	
- BUYING CHOICES				
How can I get it?				
Product Care	Up to 3yrs Replacement Product Care £40 - £49.99. Price: £12.49	Up to 3yrs Replacement Product Care £50 - £59.99. Price: £14.99	Up to 3yrs Replacement Product Care £5 - £9.99. Price: £1.99	Up to 3yrs Replacement Product Care £30 - £39.99. Price: £9.99
Credit Offers (Representative 29.9% APR variable)	Not available	Nothing to Pay for 3 Months	Not available	Not available
- CUSTOMER REVIEWS & RATINGS				
Overall Rating	4.3 / 5	4 / 5	4.9 / 5	4.3 / 5
- SPECIFICATIONS				
Colour	Black	Silver	Information not available	Information not available
Colour group	Blacks	Metallics	Pinks	Metallics
Capacity (L)	1	1.7	1.7	1.5
Rapid boil	Yes	Yes	No	Yes
Power (kW)	3.1	3	2.2	Information not available
Concealed element	Yes	Yes	No	Yes
EAN/MPN/UPC/ISBN	5011832028693	3030059000178	9099414	5011773051972
Material	Information not available	Stainless steel	Plastic	Stainless steel
	Full Product Details	Full Product Details	Full Product Details	Full Product Details
	Buy or Reserve	Buy or Reserve	Buy or Reserve	Buy or Reserve

Essential Information
Customer Services
Privacy policy
Cookie policy
Terms & conditions
Site map
Secure online shopping
Email sign up

Shopping at Argos
Argos gift card
Home delivery
Check & Reserve
Order tracking
Free returns
Quick shop
Store locator

Product information
Buying guides
Product care
Argos Card
Argos Credit & Insurance
A – Z index
Stock checker
Features & articles

About Argos
About us
Affiliate program
Argos for Business
Press enquiries

Other Argos sites
Argoscareers.com
Argos.ie
Argos-spain.co.uk

Argos on... Youtube Facebook Twitter

Argos App for... iPhone | iPod touch | Android

Argos mobile site

This link will open in a new window.

1 of 1

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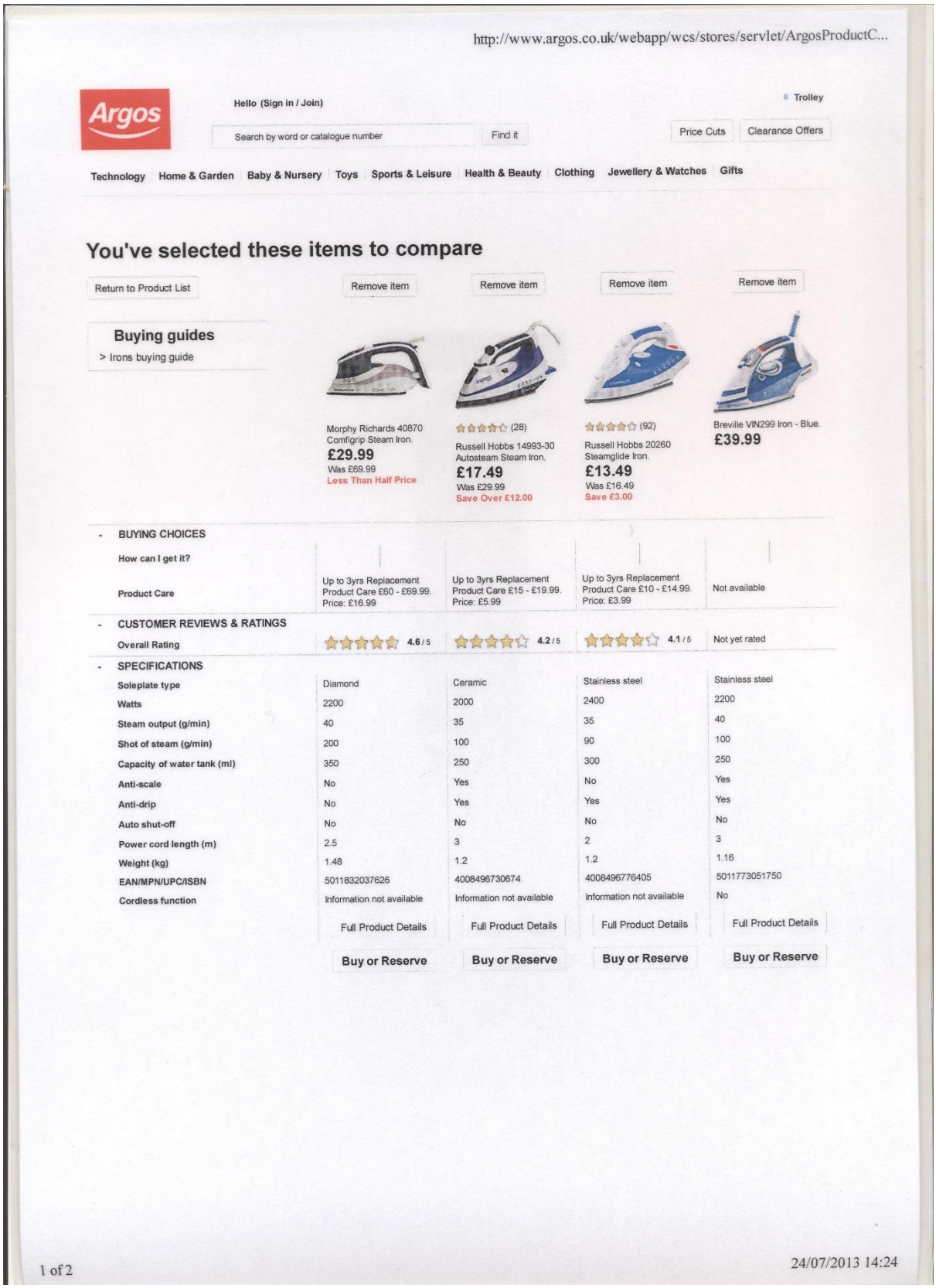
Appendix 1.3 - 'Think aloud' training practice materials, Iron



http://www.argos.co.uk/webapp/wcs/stores/servlet/ArgosProductC...

Argos

Hello (Sign in / Join)

Trolley

Search by word or catalogue number

Find it

Price Cuts | Clearance Offers

Technology | Home & Garden | Baby & Nursery | Toys | Sports & Leisure | Health & Beauty | Clothing | Jewellery & Watches | Gifts

You've selected these items to compare

Return to Product List

Buying guides

> Irons buying guide

	Remove item	Remove item	Remove item	Remove item
	Morphy Richards 40870 Comfigrip Steam Iron. **£29.99** Was £69.99 Less Than Half Price	(28) Russell Hobbs 14993-30 Autosteam Steam Iron. **£17.49** Was £29.99 Save Over £12.00	(92) Russell Hobbs 20260 Steamglide Iron. **£13.49** Was £16.49 Save £3.00	Breville VIN299 Iron - Blue. **£39.99**
BUYING CHOICES				
How can I get it?				
Product Care	Up to 3yrs Replacement Product Care £60 - £69.99. Price: £16.99	Up to 3yrs Replacement Product Care £15 - £19.99. Price: £5.99	Up to 3yrs Replacement Product Care £10 - £14.99. Price: £3.99	Not available
CUSTOMER REVIEWS & RATINGS				
Overall Rating	4.6 / 5	4.2 / 5	4.1 / 5	Not yet rated
SPECIFICATIONS				
Soleplate type	Diamond	Ceramic	Stainless steel	Stainless steel
Watts	2200	2000	2400	2200
Steam output (g/min)	40	35	35	40
Shot of steam (g/min)	200	100	90	100
Capacity of water tank (ml)	350	250	300	250
Anti-scale	No	Yes	No	Yes
Anti-drip	No	Yes	Yes	Yes
Auto shut-off	No	No	No	No
Power cord length (m)	2.5	3	2	3
Weight (kg)	1.48	1.2	1.2	1.16
EAN/MPN/UPC/ISBN	5011832037626	4008496730674	4008496776405	5011773051750
Cordless function	Information not available	Information not available	Information not available	No
	Full Product Details	Full Product Details	Full Product Details	Full Product Details
	Buy or Reserve	Buy or Reserve	Buy or Reserve	Buy or Reserve

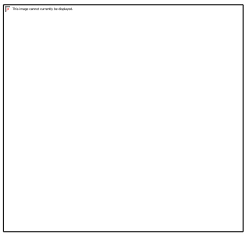
1 of 2

24/07/2013 14:24

Appendix 2 - Ethics approval letter

MEDICAL SCIENCES INTER DIVISIONAL RESEARCH ETHICS COMMITTEE
Medical Sciences Divisional Office

University of Oxford, Level 3, John Radcliffe Hospital, Headington, Oxford, OX3 9DU
Tel: +44(0)1865 228974 Fax: +44(0)1865 750750
ethics@medsci.ox.ac.uk http://www.medsci.ox.ac.uk



CONFIDENTIAL Ref: **MSD-IDREC-C1-2013-087**

[Address] 28th May 2013

Dear Dr Rayner and Ms Cowburn

I am writing to acknowledge receipt of your CUREC/1 form for your project: **FLICC: Front of Pack Labelling: impact on consumer choice**

On the basis of the information you have provided this has now been approved by the Medical Sciences IDREC **subject to:**

a) it is your responsibility to comply with the requirements for administering any tests or questionnaires and if in doubt to contact the publisher of those tests or questionnaires.

The reference number for this project is **MSD-IDREC-C1-2013-087** and may I remind you that your project may be reviewed at some stage during an annual audit of projects.

Amendments

Should you at some stage alter some of the techniques or procedures then you should first undertake a checklist (CUREC/1) to see whether these changes alter the ethics of the research. If these remain the same then the committee will require notification of the changes to lodge with the project. If they do not remain the same then you may need to complete a CUREC/2 form and undergo further scrutiny by the committee.

Please do not hesitate to contact me if you have any queries about this.

Yours sincerely

Rosie Mortimer
Senior Assistant Registrar & Secretary to IDREC

Appendix 3 - Recruitment poster/flyer

Appendix 4 - Study information sheet

[University logo and address]

'Exploring decisions made during routine supermarket shopping'

Information for participants

About this study

The University of Oxford and the University of Surrey are working with other universities to investigate what affects the choices you make during your regular food shopping. We are asking shoppers to take part in this research which will help us to understand the different factors which affect the decisions you make when you are shopping for food. This will help us to understand how to help shoppers make choices.

In this leaflet, we have provided some detailed information about the study so that you can understand what we are planning to do, before you decide whether or not you would like to be involved.

Why have I been invited?

You have been invited to take part in the study because you regularly shop at the *[name of participating supermarket, store location]* and sometimes buy pre-packed foods.

Do I have to take part?

It is up to you to decide whether or not you would like to take part. If you agree, we will ask you to sign a consent form. If you do agree and then decide that you would rather not take part, you can leave the study at any time, just by advising the researchers of your decision. There will be no penalty to you for leaving the study at any time.

W*hat would I have to do?*

If you agree to take part in the study, you will be asked to do one of the three things listed below while you carry on with your planned food shopping:

- To allow a researcher to accompany you around the store, asking you to 'think-aloud' about what you are doing and to explain the reasons for making your choices. You will need to wear a small voice recorder so that we can record what you say.
- To wear a small camera around your neck which will automatically take photographs as you go around the store.
- To wear a special pair of glasses which automatically track what you see as you go around the store.

In each case, after you have completed and paid for your shopping, you will be asked to complete a questionnaire and to take part in an interview with one of the researchers. The interview will take about one hour and the interviewer will ask a series of questions about your shopping. They will use the information collected during your shop (either from the researcher who accompanied you, or from looking at the images taken by the camera or the special glasses) to find out more about some of the food products you have chosen and the

reasons for your choices. We will provide 'cool bag' facilities if you need them and provide a safe area so that your shopping is secure.

If you agree, the interview will be recorded using a digital recorder. The researchers will make a note of what you have purchased in your shopping (by writing down product details and taking photographs).

Where will it take place?

The first part of the study will take place in *[store location],* while you do your normal shopping. The second part of the study (completing the questionnaire and interview) will also take place in *[store location],* screened from other shoppers.

Will I get paid?

You will be offered a £20 high street voucher which can be used in many high street stores to thank you for taking the time to help us.

Who will conduct the study?

The study researchers are:

[Names of researchers and University affiliations]

What are the possible benefits to taking part in this study?

By taking part in this research you will help us to find out the different factors which affect the decisions you make when you are shopping for food. This will help us to understand how to help shoppers make choices. You might also find it interesting to consider why you choose the foods that you do.

What are the possible disadvantages to taking part in this study?

We do not expect there to be any risks involved in you taking part in the study. If you do not want to answer any of the questions in the questionnaire or during the interview you do not have to. You will also be able to check and delete any images taken whilst you are taking part in the study, if you want to. The project has been reviewed by, and received ethics clearance through, the University of Oxford Central University Research Ethics Committee. The study reference number is MSD-IDREC-C1-2013-087. It has also received clearance from the University of Surrey ethics committee.

What will happen to the information I provide?

The information you provide will only be shared within the research team. Any information you provide will be stored securely. We will give a unique number to the information which you provide. This means that we will not need to use your name to keep track of your information, so it will not be possible to identify you personally in any reports, papers or theses which are produced. Any personal information which you provide will be held and processed in accordance with the provisions of the Data Protection Act. At the end of the study, we will destroy all personal information.

The results of the research will contribute to a report and academic papers about the factors which influence the choices that people make during their usual supermarket shopping. The University of Oxford is committed to the dissemination of its research for the benefit of society and the economy and, in support of this commitment, has established an online archive of research materials. This archive includes digital copies of student theses successfully submitted as part of a University of Oxford postgraduate degree programme.

Holding the archive online gives easy access for researchers to the full text of freely available theses, thereby increasing the likely impact and use of that research.

If you agree to participate in this project, some of the research will be written up as a thesis. On successful submission of the thesis, it will be deposited both in print and online in the University archives, to facilitate its use in future research. The thesis will be published with open access, meaning that the research will be available to every internet user. However, it will not be possible to identify you as a participant in the research.

What happens next?

If you decide that you do not want to take part in the study, thank you for taking the time to consider taking part.

If you want to take part, or would like further information before you decide whether or not you want to take part, or you have any questions please contact Gill Cowburn (Senior Researcher) on 01865 289246, email gill.cowburn@dph.ox.ac.uk or at the British Heart Foundation Centre on Population Approaches for Non-Communicable Disease Prevention, Old Road Campus, Headington, Oxford, OX3 7LT.

If you have a concern about any aspect of this project, please speak to Gill Cowburn who will do her best to answer your query. If you remain unhappy and wish to make a formal complaint, please contact the Research Ethics Committee at the University of Oxford (ethics@medsci.ox.ac.uk; Medical Sciences Inter-Divisional Research Ethics Committee, Medical Sciences Divisional Office, Level 3 John Radcliffe Hospital, Oxford, OX3 9DU, UK).

[Logos of participating Universities]

Appendix 5 - Participant consent form

[Logo and address of University of Oxford]

Consent Form for 'Exploring decisions made during routine supermarket shopping' study

Please tick the appropriate boxes	**Yes**	**No**
Taking Part		
I have read and understood the project information sheet dated June 2014	☐	☐
I have been given the opportunity to ask questions about the project.	☐	☐
I have received satisfactory answers to all of my queries about the study	☐	☐
I understand that my taking part is voluntary; I can leave the study at any time and I do not have to give any reasons for why I no longer want to take part. I understand that there will be no penalty to me for leaving the study at any time.	☐	☐
I understand all data will be treated as personal under the 1998 Data Protection Act, and will be stored securely.	☐	☐
I understand my personal details such as phone number and address will not be revealed to people outside the project.	☐	☐
I understand who will have access to my data and what will happen to my data at the end of the project	☐	☐
I understand that the study has received ethics clearance through the University of Oxford Central University Research Ethics Committee	☐	☐
I understand that if I have a concern about any aspect of this project, I can speak to the researcher concerned (Gill Cowburn, 01865 289246). If I still have the concern after contact with the researcher I may make a formal complaint to the Research Ethics Committee at the University of Oxford (ethics@medsci.ox.ac.uk;).	☐	☐
I agree to take part in the project. Taking part in the project will include being interviewed and recorded (audio)	☐	☐
So we can use the information you provide legally		
I agree to assign the copyright I hold in any materials related to this project to Gill Cowburn	☐	☐

_____ _____ _____

Name of participant [printed] Signature Date

_____ _____ _____

Researcher [printed] Signature Date

Contact details of the researcher: Gill Cowburn, Senior Researcher, British Heart Foundation Centre on Population Approaches for Non-Communicable Disease Prevention , Old Road Campus, Headington, Oxford, OX3 7LF Tel.: +44 1865 289246 Mail: gill.cowburn@dph.ox.ac.uk

[Logo's of participating supermarket and Universities]

Appendix 6 - Non-participation questionnaire

[University logo and address]

'Exploring decisions made during routine supermarket shopping'

Feedback Questionnaire June 2014

You have recently enquired about this research but decided not to participate. As this is a new study, we are keen to find out more about why you chose not to take part as this may help us to improve future recruitment to the research.

We invite you to complete this short feedback questionnaire but you do not have to do so. There is no intention to persuade you to participate in the research.

1. Why didn't you want to participate in the 'Exploring decisions made during routine supermarket shopping' research? *(Tick as many statements as you like)*

- ☐ Not really interested
- ☐ I didn't see why this research was important
- ☐ The research sounded like a lot of effort for me
- ☐ I thought it would take up too much of my time
- ☐ I didn't like the idea of being observed around the store when I was shopping
- ☐ I didn't like the idea of wearing a camera
- ☐ I didn't like the idea of wearing the special glasses
- ☐ I didn't like the idea of being recorded
- ☐ Other reason (please provide more information)

2. If you would like to say anything else, please write it below:

Please return the completed form to Gill Cowburn (Senior Researcher) by email gill.cowburn@dph.ox.ac.uk or at British Heart Foundation Centre on Population Approaches for NCD Prevention, Old Road Campus, Headington, Oxford, OX3 7LT

Appendix 7 - Autographer camera protocol for researchers

1. Note number of Autographer and link with participant number

2. Consent form check - is it signed? Ask participant:

   "are you happy that you have read and understood the information sheet?"

   "Any further questions?"

3. Overview of today's task:

   - Introduction to Autographer
   - Shopping – remind them it is their shop and they are paying
   - Post shop – questionnaire, record of purchases, interview

4. Ask:

   "what size of shop are you doing today?"
   "how long do you think your shop will take?"
   "you'll remember that after you've finished your shopping we'd like you to talk to me which will take about one hour - is that still ok?" [If yes - continue, if no – rebook]
   "do you need to leave by a particular time?"

5. **Introduction to Autographer**

   "This is the camera I'd like you to wear while you do your shopping. I've already turned it on – it goes over your neck and needs to stay clear of your clothing. Is that comfortable?" Adjust the lanyard so that the Autographer is positioned mid-chest of participant.

   "You don't have to do anything with the camera – it will automatically take pictures as you go around the store. You will get chance to see the images after you have finished your shopping"

   "Is there anything you want to ask?"

6. **Instructions for the shop:**

   "Carry out your shopping in your usual way. I'll meet up with again by the checkout"

   "Any more questions before we start?"

7. **After Shopping has been completed:**

   Remove and turn off Autographer

   "Thank you"

8. *"We'd only like to talk to you about some of the products you've chosen today – the prepacked ones - would you like me to help pack your shopping so we can pack those items separately to speed things up a bit or would you rather pack your own?"*

   Take participant to area for post shop activities

Appendix 8 – Tobii eye-tracking glasses protocol for researchers

1. Link participant number with eye-tracking data file

2. Consent form check - is it signed? Ask participant:

   "are you happy that you have read and understood the information sheet?"

   "any further questions?"

3. Overview of today's task:

   - Introduction to eye-tracking equipment
   - Shopping – remind them it is their shop and they are paying
   - Post shop – questionnaire, record of purchases, interview

4. Ask:

   "what size of shop are you doing today?"
   "how long do you think your shop will take?"
   "you'll remember that after you've finished your shopping we'd like you to talk to me which will take about one hour - is that still ok?" [If yes - continue, if no – rebook]
   "do you need to leave by a particular time?"

5. **Introduction to eye-tracking**

   "These are the glasses I'd like you to wear while you do your shopping. I've already turned them on. Is that comfortable?"

   "We need to calibrate the glasses to you so I'll ask you to do a couple of things to set that up before you get started on your shopping"

   Follow eye-tracking calibration protocol

   "You don't have to do anything with the glasses – they will automatically record what you see as you go around the store. You will get chance to see the images after you have finished your shopping"

   "Is there anything you want to ask?"

6. **Instructions for the shop:**

   "Carry out your shopping in your usual way. I'll meet up with again by the checkout"

   "Any more questions before we start?"

7. **After Shopping has been completed**

   Remove and turn off eye-tracking glasses

   "Thank you"

8. *"We'd only like to talk to you about some of the products you've chosen today – the prepacked ones - would you like me to help pack your shopping so we can pack those items separately to speed things up a bit or would you rather pack your own?"*

   Take participant to area for post shop activities

Appendix 8.1 - Tobii eye-tracking glasses calibration protocol for researchers

1. Position Tobii eye-tracking glasses on participants and ensure they are comfortable

2. Ensure equipment is switched on

3. Position participants chair 1m distant from plain screen

4. Place calibration marker onto the screen and move in a clockwise grid direction, asking participants to move their gaze (but not their head) to focus on the four corners of the grid

5. Check that the calibration screen turns green before moving to the next point

6. Once all five points (4 corners plus one central) have registered green the calibration is complete

Appendix 9 - Safe use of wearable cameras: protocol for researchers

The purpose of this protocol is to set out the health and safety procedures which should be adopted by FLICC participants wearing Autographer/ Tobii eye-tracking equipment during the course of the data collection in store. Although the wearing of the equipment is not expected to be risky, the protocol will be discussed with each of the participants prior to the start of data collection. This will alert and prepare them for any potential problems.

Wearing the equipment

The equipment itself is safe to wear. A researcher will help to adjust the equipment so that it is properly and securely fitted prior to the start of data collection. Participants using the eye-tracking glasses will be asked to take care when they first put on the glasses, so that they adjust to wearing them. They will be offered the opportunity to walk for a few moments, escorted by a researcher, until they feel comfortable to walk unaccompanied. Participants will be reminded that they are free to remove the equipment at any time, during data collection, if they become uncomfortable.

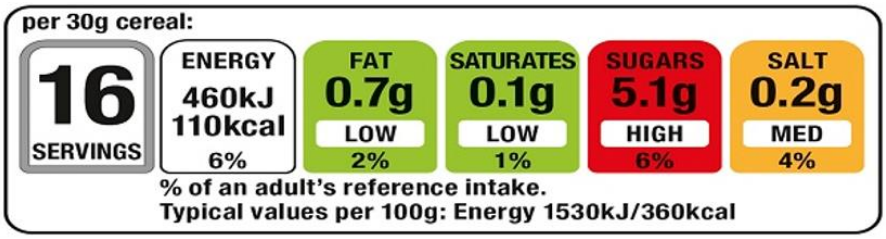
Personal safety

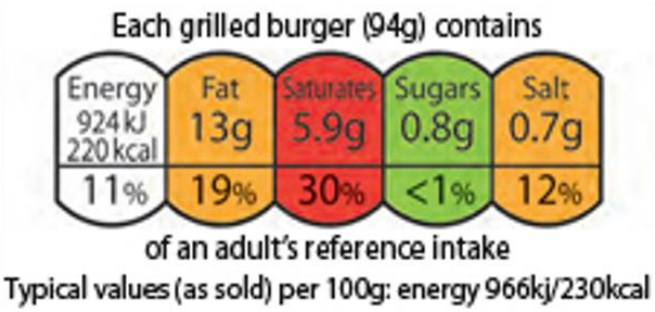
If other shoppers question the participant about the equipment, the following suggested replies may be helpful:

Autographer/Tobii eye-tracking glasses			
Q	**What are you wearing?**	A	It's a data recorder
Q	**What does it do?**	A	It collects visual images of my shopping
Q	**Can I see the images?**	A	No, because they need to be downloaded to a computer first
Q	**Why are you wearing it?**	A	I am taking part in some University research

If the participant feels that wearing the Autographer/Tobii eye-tracking glasses makes them vulnerable or unsafe, they should remove the equipment and report to the researchers in store. Participants should not put themselves at personal risk – in the unlikely event that they are personally threatened and asked to remove the equipment, they should do so. They should call for help if/when it is safe to do so. The research team and store staff will be briefed on the appropriate procedure to follow in such an event – to let the equipment go, to stay personally safe and to call store security/police, as appropriate.

Appendix 10 - Examples of the format of FOP nutrition information panel used in study stores





Appendix 11 - Post-shop questionnaire

Exploring decisions made during routine supermarket shopping - questionnaire

Participant ID number:

Interviewer ID:

Date:

Thank you for helping out with our study. Please answer the following questions by ticking the box which applies to you.

ABOUT YOU

1. Are you

1 Female ☐

2 Male ☐

2. How old are you?

1 18-25 years ☐

2 26-35 years ☐

3 36-45 years ☐

4 46-55 years ☐

5 56-65 years ☐

6 66-75 years ☐

7 76 years or more ☐

3. Please write down the postcode for your house

1 ☐

4. At what age did you finish your continuous full-time education at school or college?

1 Not yet finished ☐

2 Never went to school ☐

3 14 years or under ☐

4 16 years ☐

5 18 years ☐

6 19 years or over ☐

5. What is the highest level of qualification you have?

1 Degree/degree level qualification (including higher degree) ☐

2 A Level ☐

3 O Level/GCSE ☐

4 School Certificate ☐

5 NVQ ☐

6 Recognised Trade Apprenticeship ☐

7 Clerical or Commercial Qualification ☐

8 Other qualification (please say what) ☐

6. Which of these descriptions applies to what you were doing last week?

1 Going to college/university full-time (including on vacation) ☐

2 In paid employment or self-employment (or away temporarily) ☐

3 On a Government scheme for employment training ☐

4 Unemployed ☐

5 Permanently unable to work because of long-term sickness or disability ☐

6 Retired from paid work ☐

7 Looking after the home or family ☐

8 Doing something else (please say what) ☐

7. How would you describe your ethnic group?

1 White/White British ☐

2 Asian/Asian British

2.1 Indian ☐

2.2 Pakistani ☐

2.3 Bangladeshi ☐

2.4 Chinese ☐

2.5 Other ☐

3 Black/African /Black British

3.1 Caribbean ☐

3.2 African ☐

3.3 Other ☐

4 *Mixed/multiple groups*

4.1 White and Black Caribbean ☐

4.2 White and Black African ☐

4.3 White and Asian ☐

5 *Any other ethnic group* ☐

Write in here

ABOUT YOUR HEALTH

8. How is your health in general? Would you say it is:

1 Very good ☐

2 Good ☐

3 Fair ☐

4 Bad ☐

5 Very bad ☐

9. If you are female, are you currently pregnant or breastfeeding?

1 Yes ☐

2 No ☐

10. Do you have any long-standing illness, disability or infirmity? By long-standing we mean anything that has troubled you over a period of time, or that is likely to affect you over a period of time?

1 Yes ☐ Please write some more information in this space

2 No ☐

11. Does this limit your activities in any way?

1 Yes ☐ Please write some more information in this space

2 No ☐

ABOUT YOUR FOOD SHOPPING

12. Are you the main food shopper for your household?

1 Yes ☐

2 No ☐ Who is the main food shopper for your household?

13. How many people live in your usual household?

	1 Adults	2 Children aged under 16	3 Children age 16 or older
My usual household includes	☐	☐	☐

14. Is anyone in your usual household currently on a 'special' diet?

1 Yes ☐ Please write some more information in this space

2 No ☐

15. Is anyone in your household currently trying to lose weight?

1 Yes ☐

2 No ☐

16. Where does your household shop for food? Please include all shopping, including your main shopping, top-up shopping in between your main shopping trips and any other food shopping

	Tick each box which applies
1 Large supermarket (including home delivery from supermarket)	☐
2 Mini supermarket	☐
3 Specialist ethnic food store/supermarket	☐
4 Local/corner shop (including newsagents)	☐
5 Garage forecourt	☐
6 Independent greengrocer	☐
7 Independent butcher	☐
8 Independent baker	☐
9 Independent fishmonger	☐
10 Market, including farmers market	☐
11 Delicatessen	☐
12 Farm	☐
13 Home delivery (including vegetable boxes) not from supermarket	☐
14 Other (Please give us some more information)	☐

17. How often does your household shop for food?

	1 Monthly	2 Twice a month	3 Weekly	4 Daily	5 Never
a) Main shop	☐	☐	☐	☐	☐
b) Top up shop between the main shopping	☐	☐	☐	☐	☐
c) Other type of shop (please write some more information in this space)	☐	☐	☐	☐	☐

ABOUT WHAT YOU EAT[3]

18. Here are some more statements that we would like you to look at. For each statement, please tick one box to show how much you agree or disagree with the statement

	1 Agree strongly	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Disagree strongly
a) I am very particular about the healthiness of food	4	3	2	1	0
b) I always follow a healthy and balanced diet	4	3	2	1	0
c) It is important for me that my diet is low in fat	4	3	2	1	0
d) It is important for me that my daily diet contains a lot of vitamins and minerals	4	3	2	1	0
e) I eat what I like and do not worry about the healthiness of food	0	1	2	3	4
f) I do not avoid any foods, even if they may raise my cholesterol	0	1	2	3	4
g) The healthiness of food has little impact on my food choices	0	1	2	3	4
h) The healthiness of snacks makes no difference to me	0	1	2	3	4

[3] Scores for questions 18, 19, 20, 23, 24 and 25 added after completion of data collection

19. Please tick one box to show how much you agree or disagree with each statement

	1 Agree strongly	2 Agree	3 Neither agree nor disagree	4 Disagree	5 Disagree strongly
a) I know a lot about healthy eating	4	3	2	1	0
b) I do not feel very knowledgeable about healthy eating	0	1	2	3	4
c) I know more about healthy eating than most of my friends	4	3	2	1	0
d) I know less about healthy eating than most other people	0	1	2	3	4
e) When it comes to healthy eating I really don't know a lot	0	1	2	3	4

The following questions ask about some foods & drinks you might have during a 'typical' week, over the past month or so. Do not be concerned if some things you eat or drink are not mentioned.

20. Please tick how often you eat at least ONE portion of the following foods & drinks: (a portion includes: a handful of grapes, an orange, a serving of carrots, a side salad, a slice of bread, a glass of pop). *(Please only put one tick, but answer **EVERY** line)*

	Rarely or never	Less than 1 a Week	Once a Week	2-3 times a Week	4-6 times a Week	1-2 times a Day	3-4 times a Day	5+ a Day
Fruit (tinned / fresh)	☐ 0	☐ 0	☐ 0	☐ 1	☐ 2	☐ 3	☐ 3	☐ 3
Fruit juice (not cordial or squash)	☐ 2	☐ 2	☐ 2	☐ 2	☐ 1	☐ 1	☐ 0	☐ 0
Salad (not garnish added to sandwiches)	☐ 0	☐ 0	☐ 0	☐ 1	☐ 2	☐ 3	☐ 3	☐ 3
Vegetables (tinned / frozen / fresh but not potatoes)	☐ 0	☐ 0	☐ 0	☐ 1	☐ 2	☐ 3	☐ 3	☐ 3
Chips / fried potatoes	☐ 3	☐ 3	☐ 2	☐ 0	☐ 0	☐ 0	☐ 0	☐ 0
Beans or pulses like baked beans, chick peas, dahl	☐ 0	☐ 0	☐ 1	☐ 2	☐ 3	☐ 3	☐ 3	☐ 3
	Rarely or never	Less than 1 a Week	Once a Week	2-3 times a Week	4-6 times a Week	1-2 times a Day	3-4 times a Day	5+ a Day
Fibre-rich breakfast cereal, like Weetabix, Fruit 'n Fibre, Porridge, Muesli	☐ 0	☐ 0	☐ 1	☐ 2	☐ 3	☐ 3	☐ 3	☐ 3
Wholemeal bread or chapattis	☐ 0	☐ 0	☐ 1	☐ 2	☐ 3	☐ 3	☐ 3	☐ 3
Cheese / yoghurt	☐ 0	☐ 0	☐ 1	☐ 2	☐ 3	☐ 3	☐ 3	☐ 2
Crisps / savoury snacks	☐ 3	☐ 3	☐ 2	☐ 1	☐ 0	☐ 0	☐ 0	☐ 0
Sweet biscuits, cakes, chocolate, sweets	☐ 3	☐ 3	☐ 2	☐ 1	☐ 0	☐ 0	☐ 0	☐ 0
Ice cream / cream	☐ 2	☐ 2	☐ 1	☐ 0	☐ 0	☐ 0	☐ 0	☐ 0
Non alcoholic fizzy drinks/pop (not sugar free or diet)	☐ 2	☐ 2	☐ 0	☐ 0	☐ 0	☐ 0	☐ 0	☐ 0

	Rarely or never	Less than 1 a Week	Once a Week	2-3 times a Week	4-6 times a Week	7+ times a week
WHOLE MEATS						
Beef, Lamb, Pork, Ham - steaks, roasts, joints, mince or chops	☐ 2	☐ 2	☐ 2	☐ 2	☐ 1	☐ 0
Chicken or Turkey – steaks, roasts, joints, mince or portions (not in batter or breadcrumbs)	☐ 2	☐ 2	☐ 2	☐ 2	☐ 1	☐ 0
PROCESSED MEAT/MEAT PRODUCTS						
Sausages, bacon, corned beef, meat pies/pasties, burgers	☐ 2	☐ 2	☐ 1	☐ 1	☐ 0	☐ 0
Chicken/turkey nuggets/twizzlers, turkey burgers, chicken pies, or in batter or breadcrumbs	☐ 2	☐ 2	☐ 1	☐ 1	☐ 0	☐ 0
FISH						
White fish in batter or breadcrumbs – like 'fish 'n chips'	☐ 2	☐ 2	☐ 1	☐ 0	☐ 0	☐ 0
White fish not in batter or breadcrumbs	☐ 0	☐ 0	☐ 1	☐ 2	☐ 1	☐ 1
Oily fish – like herrings, sardines, salmon, trout, mackerel, fresh tuna (not tinned tuna)	☐ 0	☐ 0	☐ 2	☐ 3	☐ 2	☐ 2

21. On average, how many portions of FRUIT do you eat a day?
(examples include a handful of grapes, an orange, a glass of fruit juice, a handful of dried fruits)

22. On average, how many portions of VEGETABLES do you eat a day? (examples include: 3 heaped tablespoons of carrots, a side salad, 2 spears of broccoli)

23. What milk do you <u>usually</u> use or drink, such as in hot & cold drinks or on cereal? (including tea, coffee, hot milk, milk shakes, or on cereal)

Whole / full-fat milk	☐ 0	Semi-skimmed milk	☐ 1
Skimmed milk	☐ 2	Rarely/never use milk	☐ 1
Other (please write its name) 1			

24. How much of the following nutrients do health experts recommend that UK adults should have?

	1 More	2 About the same	3 Less	4 None at all	5 I don't understand what this is
a) Sodium	0	1	2	0	0
b) Trans fat	0	0	1	2	0
c) Omega-3 fatty acids	2	1	0	0	0

25. How much of the following foods do health experts recommend that UK adults should have?

	1 A lot	2 Some	3 A little	4 None at all
a) Starchy foods (bread, rice, pasta, potatoes)	2	1	0	0
b) Protein (meat, fish, eggs, beans)	0	2	1	0
c) Milk and dairy foods	0	2	1	0

26. How frequently do you use the front of pack nutrition panel information (containing traffic lights or guideline daily amounts) on food packs when buying food?

1 Always ☐
2 Often ☐
3 Occasionally ☐
4 Rarely ☐
5 Never ☐

27. Thinking about the amount of nutrition information on the front of food packs, do you think there is:

1 Far too much information ☐
2 Too much information ☐
3 Enough information ☐
4 Not enough information ☐
5 Not nearly enough information ☐
6 Don't know ☐

28. Do you think the front of pack nutrition panel information (containing traffic lights or guideline daily amounts) on food packs is:

1 Very easy to understand ☐
2 Quite easy to understand ☐
3 Neither easy or difficult to understand ☐
4 Quite difficult to understand ☐
5 Very difficult to understand ☐

Thank you very much for completing this questionnaire. We appreciate you taking the time to help us with our research. Please give the completed questionnaire to one of the researchers. THANK YOU![4]

[4] Part of this questionnaire (q20-23) is from SFFFQ: V1.0 December 2009 Copyright (c) 2008 University of Leeds. All rights reserved. Any third party wishing to use the SFFFQ in any way must obtain the prior written consent of the University of Leeds (Cristina Cleghorn)

Appendix 12 - Leeds short form food frequency questionnaire permission for use

Gill Cowburn

From: Cristina Cleghorn <C.L.Cleghorn@leeds.ac.uk>
Sent: 17 September 2013 10:41
To: Gill Cowburn
Subject: FW: Developing a simple tool to measure diet in public health population surveys

Importance: High

Hi Gill,

Would you be able to include this statement somewhere on the questionnaire:

"Part of this questionnaire is from:
SFFFQ. V1.0 December 2009
Copyright (c) 2008 University of Leeds. All rights reserved.
Any third party wishing to use the SFFFQ in any way must obtain the prior written consent of the University of Leeds (Cristina Cleghorn)."

You could either include it at the end of the questionnaire with the 2 pages of the SFFFQ identified somehow (page reference or having SFFFQ on the 2 pages) or at the bottom of the 2 pages the SFFFQ is on. Or wherever makes sense to your team.

And please consider this email as our formal consent for you to use the SFFFQ.

Appendix 13 - Product prompt selection protocol

Pre-packed food selection for use in post-shop interview: checklist

Selection criteria	
1. Exclude non-food items	e.g. toilet rolls, washing powder etc
2. Exclude non-prepacked food items	e.g. fruit and vegetables, deli items etc
3. Exclude prepacked food items with no FOP nutrition panel	
4. Include 4-8 prepacked food items with: • Range of FOP nutrition label formats e.g. TL, %GDA, hybrid TL/%GDA • Across range of categories - Pizza, pie, quiche, sausage rolls etc - Ready meals - Pasta/sauce combinations or similar - Individual items for main meal e.g. prepared fish, burgers - Desserts e.g. chilled, yoghurt, ice-cream - Breakfast cereals - Other items – crisps, biscuits	

Appendix 14 - Post-shop interview schedule

Post-shop interview schedule

Participant ID number:

Interviewer ID:

Date:

Before interview commences:
Thank you for taking the time to take part in our study today. Can I just check a few things with you?

Have you completed your planned shopping for today? ☐

You took part in the 'usual' shop ☐ or 'use FOP nutrition label' shop? ☐

You took part using:

Think aloud	☐
Autographer	☐
Tobii eye-tracking glasses	☐
Think aloud/Autographer	☐
Think aloud/Tobii eye-tracking glasses	☐

You have completed the questionnaire?

We've downloaded the data from your Autographer/Tobii eye-tracking glasses?

Preamble

The purpose of today's interview is to ask you a series of questions about the shopping you have done today. We will also use the information collected during your shop *[from the researcher who accompanied you/from looking at the images taken by the Autographer camera or the Tobii eye-tracking glasses]* to find out more about some of the foods you have chosen and the reasons for your choices. You might make some choices automatically or unconsciously, so it's ok if you can't think of anything to say. Today we are only focusing on the pre-packed foods that you have selected.

If you agree, the interview will be recorded using a digital recorder so we have a full record of what was said. If you don't want to answer any of the questions asked during the interview you don't have to. *[You will also be able to check and delete any images taken, if you want to].* Nothing you say will be identifiable as coming from you – are you happy with this?

I also need to make a note of the pre-packed foods you have purchased in your shopping (by writing down product details and taking photographs). Is that ok?

Before we start, do you have any questions?

Thinking about your food shop today – how would you best describe it? Is it more of a main shop or a 'top up' shop?

How does your shopping today reflect what you'd usually buy? So, how typical a shop is this for you, today?

Prompt: If yes, ask in what way?

Prompt: If no, ask in what way and what might be more typical…

For Think-aloud participants

Let's look at the shopping you have done today.

For Autographer/Tobii eye-tracking participants

Let's take a look at what you saw when you were shopping today –

[scroll through images]

You're looking at the shelves…what are you doing?

So, you've stopped here… what's happening?

What are you doing/seeing here?

Which did you choose/ why?

What are you thinking here?

How did that affect what you bought?

Explore, based on images

For Think aloud participants

Ok, when you were shopping today I noticed you …. [spent a long time looking at…, hesitated and put … back…]

Could you tell me a bit more about that?

OK, let's look, if we may, at some of the pre-packed foods you've chosen today.

Select relevant products and discuss each one in turn:

Non-think aloud participants – **Could you tell me a bit about what made you decide to buy this today?**

Think aloud participants - **Could you tell me a bit about what made you decide to buy this today?** Sorry, if this feels a bit like this is repeating yourself a bit because you might have told us this during your think aloud…

Prompt: convenience, habit, cost?

Only as final prompt: health concerns?

Do you ever look at anything on the front of the pack to help you make a decision about the food you're going to buy?

Prompt: focus on FOP – image, claims, nutrition panel

What else on the pack helps you to decide?

Now, I'd like to focus a bit on the FOP nutrition panel. We know that people hold different views about using nutrition labels and we're interested to hear what you think about them.

For 'Use FOP nutrition label' shoppers only – **We asked you to use the FOP nutrition label in your shop today – how did that go?**

Prompt: in what ways did you use it? How did it change what you bought? You didn't use it – why?

Focusing on the FOP nutrition panel – in what ways do you use it when you're shopping?

Prompt: choose between two items, look at the reds/greens, check the calories, look at the numbers

How often would you say that you usually use the FOP nutrition panel when you are shopping?

How often would you say it affects what you choose? In what way?

How confident are you that you can use it? Why?

Prompt: say on a scale of 0-10 with 0 being least confident and 10 the most confident ever…where would you put yourself?

OK, so could you tell me a bit about why have you put yourself at [whatever number they say] and not [lower/higher]? What would help you to move along the scale?

What things make it difficult for you to use?

You've said you don't use the FOP nutrition information – could you say why?

Prompt; time, too difficult, confusing

What would have to change so that you might use it?

So, we've spent quite a while thinking about how you use/don't use the FOP nutrition panel when you're shopping like you did today. This is really what we are

most interested in and why we are doing this research – to understand how to encourage shoppers to use FOP nutrition labels to help them make food choices. Could we focus on what, if anything, would help you use the FOP nutrition label more?

Prompt: it was on more foods, I could use it at-a-glance, I really understood it…

What if there was information available which explained how to use it/showed you how to use it – would that be helpful or not?

Where would you be most likely to use that information?

Prompt: at home, in store, other…?

How would it suit you best to get hold of that information?

Prompt: leaflet, in-store poster, online, phone app…?

Would you be prepared to practice using the information so that you could be sure you'd know how to use it?

Is there anything else you would like to add that you feel I haven't covered in the interview?

Just before we finish – could I ask you to reflect on [thinkaloud/Autographer/Tobii eye-tracking] procedure and tell me what it was like for you?

Prompt: new ways to collect information that we've been using, and we're interested in what it feels like for you

Easy? Difficult?
Any advice for us to encourage others to participate?

Anything else?

At the end of the interview:
Thank you very much for giving up your time today for this interview. Do you have any questions about this interview or the whole research process?

Would you like to us to inform you when results from this research are available?

Would you be interested in getting helping us out with more of our research in the near future? For example, if we were to design something to help people use FOP nutrition labels more, might you be interested in telling us what you think of it?

I am now able to offer you £20 in high street vouchers as compensation for your time. [Sign receipt book, hand over voucher]

THANK YOU

Appendix 15 - Wearable camera image interview protocol

- Scroll through images and identify food shelves/ignore non-food item shelves

    Prompt for relevant image identification:

    Pick up a product

    Browse (defined as 2 or more consecutive images of same display) – facing shelves/display

- Select relevant products (according to the checklist) and identify from the images when each item was chosen.

- Discuss each item in turn - aim to find out why each item was selected (over other options) and the reasons for that choice

    Prompt: convenience, habit, cost?

    Only as final prompt: health concerns?

Prompts for general discussion:

You're looking at the shelves…what are you doing here?

So, you've stopped here… what's happening?

What are you doing/seeing here?

What are you thinking here?

Did you select anything from here?

Prompts for specific product discussion:

So this is where you chose [name purchased item] – talk me through this…

You look like you've picked up something here? What's happening?

Which did you choose/ why?

What are you thinking here?

How did that affect what you bought?

Which did you choose/ why?

Appendix 16 - Participant debriefing information sheet

[University logo and address]

'Exploring decisions made during routine supermarket shopping'

Debriefing sheet

Thank you for agreeing to take part in this study. You will remember that when you agreed to take part, we told you that this research will help us to understand the different factors which affect the decisions you make when you are shopping for food. This will help us to understand how to help shoppers make choices.

We have also now told you that we are particularly interested in how you use or don't use the Front of Pack nutrition information panel when you're shopping like you did today. This is what we are most interested in and why we are doing this research – to understand how to encourage shoppers to use the Front of Pack nutrition information panel to help them make healthier food choices. We didn't tell you this at the beginning of the study because we know from other studies that some people can change their behaviour if they know they are taking part in research like this.

Because we didn't tell you all of the reasons why we are doing the research until now, you might like to think again about whether or not you are happy to continue to take part in the study. If you would prefer to leave the study now, you are free to do so, just by letting any of the researchers know. There will be no penalty to you for leaving the study at this time. We will immediately destroy any data we have collected from you.

If you have a concern about this aspect of this project, please speak to Gill Cowburn who will do her best to address your concern. You can contact her as follows: Gill Cowburn, Senior Researcher, British Heart Foundation Centre on Population Approaches for NCD Prevention, Old Road Campus, Headington, Oxford, OX3 7LF Tel.: +44 1865 289246 Mail: gill.cowburn@dph.ox.ac.uk

If you remain unhappy and wish to make a formal complaint, please contact the Research Ethics Committee at the University of Oxford (ethics@medsci.ox.ac.uk; Medical Sciences Inter-Divisional Research Ethics Committee, Medical Sciences Divisional Office, Level 3 John Radcliffe Hospital, Oxford, OX3 9DU, UK).

Appendix 17 - Summary coding framework

Factors influencing choice (reasons for purchase/non-purchase)

- Practical considerations (e.g. ability to carry; access to car)
- Taste, likes and dislikes (e.g. personal likes, family members, others)
- Household catering
  - Meal planning (e.g. what's already at home)
  - Shopping planning (e.g. planned/spontaneous, store choice)
  - Storage (e.g. freezer, fridge, shelf-life)
  - Food preparation and cooking (e.g. time, enjoyment, equipment)
    - Home prepared
    - Pre-prepared
- Money (e.g. budget, price, offers, value for money)
- Life stage (e.g. parent, aging)
- Product presentation and choice (e.g. quality, packaging, brand, novel, pack size)
- Shopping style (e.g. habit/familiar, impulsive)
- Food's emotional role
  - Unrestrained purchasing (e.g. enjoyment, treats, discounting health advice)
  - Restrained purchasing (e.g. weight loss, guilt, good vs bad foods, waste)
- Seasonal variation (e.g. weather)
- Health
- Variety

Labels (reasons for use/non-use)

Non-nutrition labelling

- FOP labels (e.g. British, organic, welfare, vegetarian, use by date, country of origin)
- BOP labels (e.g. ingredients list, allergy, Fair Trade)

Nutrition labelling

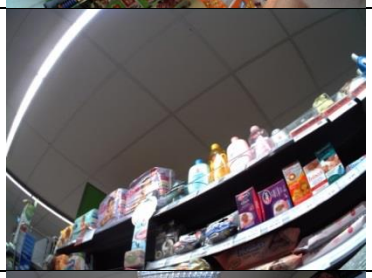
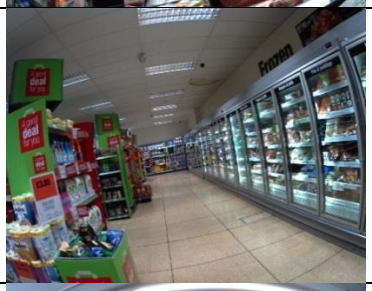
- Reasons for use (e.g. new product, new diagnosis, not recent purchase, comparison, future reference)
- Reasons for non-use (e.g. time, size, colour-blindness, Familiar/regularly purchased foods/previous experience of product)
- Location of label use (e.g. store, home)
- BOP vs FOP label use
- Different formats (e.g. within [name of participating supermarket], in other stores)
- Existing nutrition knowledge
- Nutrition labels in action
    - General issues (e.g. like with like, complexity, comprehensiveness, consistency, diet context)
    - Specific FOP issues (e.g. red alert, colours, descriptors, percentage GDA's, impact of different nutrients, portion size)
- Confidence of use
- Impact on purchase

Intervention ideas

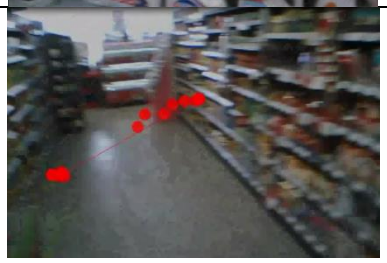
Impact of data collection method on participant

- Think aloud
- Autographer
- Tobii

Appendix 18 - Wearable camera image coding: 'episode' descriptions (Autographer)

Autographer	Definition	Example
Unusable images	Blurred/unclear images	
Non-food images	Only general non-food items such as toiletries, household items etc.	
'Walk through' images	Participants are walking in the aisles and/or moving around the store	
'Facing shelf/single shot' images	Only a single image facing a store display shelf	
'Browsing' images	2 or more consecutive images where participant is facing the display shelves but no obvious image of a product being handled	 
'Choosing' images	2 or more consecutive images where participant is facing the display shelves where within this episode an images captures a participant with a product in their hand	 

Appendix 19 - Wearable camera image coding: 'episode' descriptions (Tobii eye-tracking glasses)

Tobii		
Non-food images	Only general non-food items such as toiletries, household items etc.	
'Walk though/glancing' images	Participant walking in the aisles/moving around the store/scanning the display shelves without appearing to hold gaze	
'Browsing/choosing' images	Consecutive images where participant is facing the display shelves and may/may not pick up an item