ANNUAL REPORT

Project Title	dunnhumby Phd Studentship – Analysis of fruit and vegetable purchasing behaviour amongst UK supermarket shoppers
Project number:	CP 42
Project leader:	Dr Andrew Fearne
Report:	Annual report, August, 2007
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Key staff:	Kathryn Refausse, Phd Student
Location of project:	Kent Business School, University of Kent
Project coordinator:	Andrew Tinsley
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Key words:	Consumer research, Supermarket shoppers, fruit and vegetable purchasing behaviour

The results and conclusions in this report are based on data analysis conducted over a one-year period. The conditions under which the experiments were carried out and the results have been reported in detail and with accuracy. However, because of the contextual nature of the work it must be borne in mind that different circumstances and conditions could produce different results. Therefore, care must be taken with interpretation of the results, especially if they are used as the basis for commercial product recommendations.

AUTHENTICATION

I declare that this work was done under my supervision according to the procedures described herein and that the report represents a true and accurate record of the results obtained.

Dr Andrew Fearne
Principal Research Fellow and Project Supervisor
Kent Business School, University of Kent

Signature  Date 8.8.07

Report authorised by:

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[Name]
[Position]
[Organisation]

Signature ..... Date .....

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Grower Summary

Headline

- Consumer insight provided for mushrooms, carrots, onions, processed vegetables and soft fruit has provided support for existing and/or planned PR activity, whilst that for leafy salads, brassicas, leeks and herbs has focussed more generally on the identification of opportunities for market and product development through an overview of key market measures (customer penetration, frequency of purchase, annual growth) and segmentation (by lifestage, lifestyle and region)

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Background

The dunnhumby Academy of Consumer Research was established in April 2005 as a joint venture between Kent Business School (KBS) and dunnhumby. The Academy's mission is to expand the use of consumer insight amongst farmers and small food processors in order to improve their prospects in an increasingly competitive environment through targeted market and product development informed by research undertaken by PhD students. These students are funded by organisations representative of different commodity sectors and regions.

Given the limited resources at the disposal of growers for marketing and PR activity and the significant costs associated with market and product development, it is essential that these resources are carefully targeted to ensure the highest possible return on investment in PR and marketing activity and to inform sustainable business and marketing planning decisions.

The Academy provides a mechanism for farmers and small food producers to access information on the supermarket purchasing behaviour of 1.2 million UK households, providing unique insights into consumer demand for over 30,000 food products, segmented by lifestyle, lifestage, region, geo-demographics and shopping channel. It also provides a unique opportunity for postgraduate research into the complex area of food purchasing behaviour.

The Academy currently has eleven PhD students analysing the dunnhumby data on behalf of specific commodity sectors and/or regions. The HDC was one of the few levy boards to recognise the potential contribution of this project at an early stage, agreeing to sponsor a PhD student, Kathryn Refausse, in April 2006, to provide consumer insight to growers and packers to aid the development of production and marketing strategies and support business and marketing planning decisions.

The precise focus of the research undertaken by the student for the purpose of her PhD is not subject to the approval of the HDC. However, its contextual focus is on fresh produce and it is expected to be of widespread interest to the fresh produce industry. A draft outline of her research topic is presented in Appendix A.

Objectives and expected deliverables

The generic objective of PhD studentships within the dunnhumby Academy is the provision of targeted consumer insight to businesses (primary producers and small food producers) who would otherwise be denied access due to their lack of resources (financial and analytical). This applies to all the dunnhumby PhD studentships and is the raison d'etre of the dunnhumby Academy.

In addition to this generic objective, the dunnhumby studentship sponsored by the HDC has the following objectives

- To provide analysis of consumer purchasing behaviour to support and evaluate selected sector-specific marketing and PR activity, which for the majority of horticultural crop sectors, is co-ordinated through their respective crop association.

- To help these selected sectors to carefully target their limited resources for the highest possible return on investment in PR and marketing activity and to aid their sustainable business and marketing planning decision-making.

- To help these selected sectors to evaluate the impact of their PR and marketing activity.

Thus, the expected deliverable from this project is a stream of carefully targeted reports (un-specified in number as largely dependent on grower engagement and the response to invitations for questions), delivered in a timely manner and presented in a format that is relevant and user-friendly.

Summary of the project

This is the first year of a three year PhD studentship designed to give horticultural producers free access to the dunnhumby database (weekly food purchases of over 1.2 million UK supermarket shoppers) and analytical capacity, in the form of a PhD student, to provide unique insights into the food preferences and purchasing behaviour of UK consumers, to aid the development of production and marketing strategies for a broad range of edible horticultural crops.

The main priority in the first year has been to raise awareness of this resource within the fresh produce industry (its use to date within the fresh produce sector has been distinctly limited, primarily due to the prohibitive cost of data access through conventional (commercial) channels and the lack of analytical capacity amongst growers and the majority of fresh produce packers. This has been achieved through a number of introductory reports presented to HDC committees and affiliate organisations that have responded to the invitation for questions.

The focus of some of these questions has been on the provision of insight primarily in support of PR activity - mushrooms, carrots, onions, processed vegetables and soft fruit. Others have been more generally related to the identification of opportunities for market and product development through an overview of key market measures (customer penetration, frequency of purchase, annual growth) and segmentation (by lifestage, lifestyle and region) – leafy salads, brassicas, leeks, herbs.

Having raised awareness and delivered insights to a number of sectors in the first year, the aim in the second year is to:

- Engage with key sectors (e.g. top fruit, tomatoes) yet to recognise the value of this resource
- Provide more detailed and structured insight to those who now have a better understanding of the kind of questions that can (and cannot) be answered by the dunnhumby data
- Follow-up on the impact that the delivery of consumer insight in the first year has had on recipients (sector groups and individual businesses)

Main conclusions

The delivery of nine sector-level reports and responses to requests for information from numerous individual businesses makes it difficult to draw specific conclusions from the activities undertaken during the course of this first year. However, the following points, extracted from a sample of the sector-level reports, provide a flavour of the kind of insights that have emerged thus far from the analysis of the dunnhumby data with respect to fresh fruit and vegetables. Further details and additional examples are provided in the scientific report.

Mushroom Growers Association

Mushrooms of all types to appeal families, young and old, but under-perform[1] consistently amongst pensioners and, to a lesser extent, older adults.

From a lifestyle perspective, the consistent over-indexation of 'finer foods' and 'healthy' shoppers, for all types of mushrooms, suggests that mushrooms enjoy a positive image with respect to taste and healthiness, making them less dependent on price as a mechanism for market development.

Across the country, there is significant variation in the performance of mushrooms. For example, shoppers in the North West are 20% more likely than the average UK shopper to purchase button mushrooms but 20% less likely to buy large mushrooms and 30% less likely to buy value mushrooms. In contrast, shoppers in the East of England over-index across the board but are most likely (30%) to buy large mushrooms, whilst shoppers in Northern Ireland under-index across the board, except for button mushrooms, for which they over-index the most (40%).

[1] Performance is based on the % of supermarket shoppers in the segment (region, lifestage, lifestyle) purchasing at least one of the products in a given category, sub-category or produce range relative to the % share of that segment in UK supermarket shoppers as a whole. The highest performing segment is that which over-indexes the most (i.e. exhibits the highest propensity to purchase) and the poorest-performing segment is that which under-indexes the most (i.e. exhibits the lowest propensity to purchase), irrespective of the segment's size (number of shoppers). The base for indexation is the average for all UK supermarket shoppers. Thus, over-indexing implies that a product range/category appeals to a particular segment (i.e. they are more likely to purchase), under-indexing implies that a product range/category is unattractive to a particular segment (i.e. they are less likely to purchase). For example, if a segment over/under-indexes by x% it means the number of consumers purchasing the product from that segment is x% larger/smaller than the share of that segment in the population of UK supermarket shoppers.

This (significant) variation warrants further research, as it represents a considerable opportunity for market development if the underlying reasons can be identified and exploited through targeted PR and/or marketing activity in those regions where mushroom purchases are under-indexing.

British Carrot Growers Association

Having presented an overview of carrot purchasing behaviour to the BCGA marketing committee in September 2006, a set of follow-up questions was submitted and a further, more detailed report was presented in January 2007, the purpose of which was to assist the BCGA with the identification of specific target groups for their PR campaign.

One of the (many) questions to which the BCGA sought an answer was the profile of carrot shoppers in London, identified in the initial report as an under-performing region. The analysis undertaken in the follow-up report indicated that amongst the supermarket shoppers in London carrots appealed particularly to young families but under-performed, in both loose and bagged formats, amongst young adults – a key potential target group for subsequent PR activity. The analysis also revealed that whilst loose carrots appealed to 'Finer Food' shoppers, bagged carrots under-indexed, by 8%. Thus, PR effort could be warranted to tackle the possible perception of some shoppers that bagged carrots are of inferior quality (at least in terms of taste).

British Leafy Salads Association

The analysis of the key market measures for leafy salads revealed slow overall sales growth (1.5% from November 2005 to November 2006) but considerable variability across the category, with the mature bagged salad sector in decline but organics and unwashed salad showing impressive growth. Moreover, with penetration at 69% (i.e. almost a third of shoppers never purchase any leafy salads) and an average rate of purchase of 10.3 times per annum (i.e. less than once per month) the poor aggregate performance hides significant opportunities for market/product development if under-performing segments can be identified and targeted.

The segmentation analysis revealed organic bagged salad and unwashed salad under-performing in all but four regions – London, South East, East of England and the South West – where these sectors over-indexed significantly. It also revealed that the fastest growing bagged salad lines appealed more to 'Finer Foods' shoppers than those that had declined the most, demonstrating the need for continuous innovation to avoid commoditisation of the bagged salad category.

British Summer Fruit and Winter Berries

The analysis conducted for the soft fruit category included a good example of how the analysis of promotional impacts could be used to good effect by growers and packers, to a) avoid the exclusive focus on price promotions as a means of increasing sales volume and b) provide support for more effective promotional activities designed to attract new consumers (increase penetration) and promote new uses (increase the frequency of purchase).

For the purpose of illustration only, an analysis was undertaken of a blueberry promotion during the summer of 2006. The price was cut by a third and, in the absence of more detailed insight, the promotion might have been regarded a success from a retail perspective (volume sales rose by 48% during the promotion) but a failure from the suppliers'

perspective (value sales rose by just 1%). The simplistic conclusion hides a more complex reaction amongst shoppers, the insights from which could be used to support more carefully targeted initiative in the future.

Despite the meagre increase in sales value, the promotion resulted in a 52% increase in customer penetration (i.e. it encouraged trial) but a decline in the rate of repeat purchases and units per customer, suggesting that the first-time experience for some of the trialists was not as positive as it needed to be to induce repeat purchases, even during the promotion, which ran for a period of three weeks. Furthermore, analysis of the consumer profiles before, during and after the promotion revealed that the promotion attracted pensioners and young adults but did not appeal to young families. There was a minor impact on the lifestyle profiles (small increase in 'healthy' shoppers and small decline in 'Finer Food' shoppers) but, as is often the case, a significant impact in the regional distribution of shoppers, with the promotion drawing in (and retaining) shoppers in the North East, Yorkshire and Northern Scotland but proving less attractive to shoppers in London and the South East.

None of these segments (lifestage, lifestyle or region) were given a specific reason (e.g. recipe idea, meal occasion, serving suggestion), other than the reduced price, to purchase blueberries) but the differential impact of the promotion, revealed by the analysis of the dunnhumby data provides strong evidence of the need for a more targeted approach, if the opportunities for market/product development are to fully exploited.

Financial benefits

Given the nature of this project – provision of data access and an analytical resource – and the time lag between delivery/receipt of information, consequential action and impact on the business/market, it is neither feasible nor appropriate to estimate, at this stage of the project, the financial benefits of this project. However, the expectation is that, in years two and three (and beyond), market sectors and individuals that incorporate consumer insight into their business and marketing planning should see a higher proportion of their marketing initiatives (packaging, promotion, merchandising) and NPD (varieties, packaging formats) proving successful in either attracting new consumers or enticing existing consumer to purchase more frequently or 'trade up' to added value variants, and a greater return on their investment in generic PR, as a result of targeting scarce resources on specific consumer segments whose revealed preferences are known.

Action points for growers

- Given the limited resources at the disposal of growers for marketing and PR activity and the significant costs associated with market and product development, it is essential that these resources are carefully targeted to ensure the highest possible return on investment in PR and marketing activity and more sustainable business and marketing planning decisions.

- If the UK horticultural industry is to remain competitive in a broad range of edible horticultural crops it is essential that consumer information in general, and the dunnhumby data in particular, is fully exploited and the insights generated from its analysis incorporated into decision-making throughout the fresh produce industry, from primary production to retailing.

- The dunnhumby data is a substantial resource, designed specifically to assist businesses in targeting specific consumer segments. Adopting such a focussed

approach is likely to prove a challenge for many growers and packing operations who, for many years, have been driven by yield and capacity utilisation. This studentship and the access to the dunnhumby data that it provides removes any excuses that growers might have for not understanding consumer preferences for their products and not being aware of the opportunities that exist for market and product development. Having provided the horticultural industry with access to the information and an analytical resource to interpret it, the challenge now remains for individual businesses to act accordingly.

Science Section

Introduction

The dunnhumby database comprises weekly supermarket purchases of over 1.2 million shoppers who use the Tesco Clubcard. There are over 200,000 Stock Keeping Units (SKUs) listed in Tesco, of which around 30,000 are food and drink products. The size of the database is such that the maximum time period over which the data can be analysed is 104wks, although it is possible to analyse sales by month, week, day and hour and through the various formats which Tesco operate – hypermarkets, supermarkets, convenience stores, garage forecourts and on-line (Tesco.com currently has over 1 million shoppers).

Needless to say, the scope for analysis of this data is far greater than the capacity of one PhD student. Moreover, the 'Shop' is designed to answer specific questions, such as ''what are the key performance measures for my product(s) and how have they changed over time?', 'Who buys my product(s)', 'What other products do shoppers buy along with my product(s)' and 'How do people shop across the range of products in my category?'. Thus, the first year of this studentship was designed primarily to engage with growers, packers and marketeers, explain the kind of questions the data can answer and elicit sector and business specific questions that are most likely to be of practical value to individual businesses and representative organisations seeking to identify and exploit opportunities for market/product development and more effective use of the (limited) marketing resources available to most of them.

The features of the Clubcard database are highlighted below, followed by a description of the different types of reports that are available and examples from a sample of the reports produced during the course of the first year of the project.

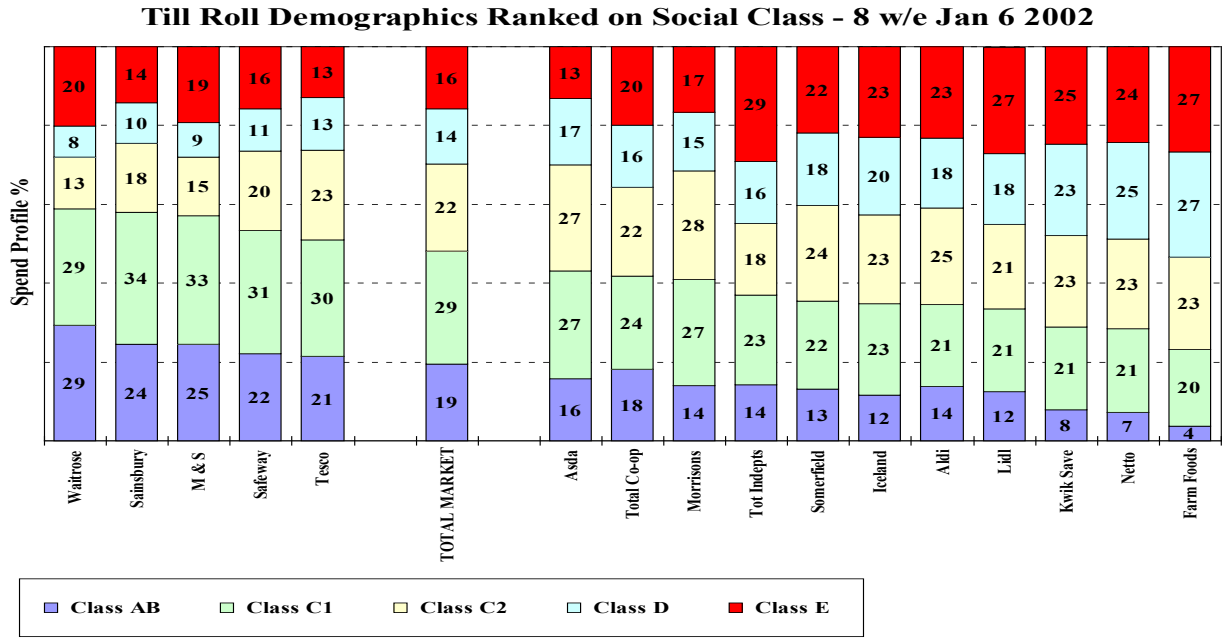
Materials and methods

Tesco is the UK's largest supermarket with a 28% share of the retail grocery market. It is also the only supermarket with a fully segmented offer, from Tesco 'Value' to Tesco 'Finest'. The significance of this is that the data is representative of all types of supermarket shopper. Indeed, the demographic profile of Tesco shoppers most closely reflects the average profile of UK supermarket shoppers (Figure 1). Moreover, the segmented customer profile is reflected in the Clubcard data, which means that we can analyse the purchasing behaviour of different types of shoppers – from different parts of the country, at different stages in the family lifecycle and with different lifestyles. Identifying the differences between groups of shoppers and developing propositions that are targeted specifically at the needs and wants of these different groups has been one of the major reasons behind the success of Tesco since the launch of the Clubcard in 1995.

Tesco Clubcard

The Tesco Clubcard was the first supermarket loyalty card of its kind and there are currently around 15 million Clubcard holders in the UK, of which approximately 12 million (circa 40% of households) are active users. On average, 80% of transactions are captured on the Clubcard system. A 10% sample (1.2 million) of households is used for the purpose of analysing shopper behaviour and the database comprises a rolling two years of sales data updated weekly.

Figure 1 – Demographic profile of UK supermarket shoppers



Source: TNS

dunnhumby Shop

dunnhumby is the company responsible for processing the raw Tesco Clubcard data into a format that is of practical value to suppliers, buyers and category managers. The information in the database is accessed through a web-based portal called the 'Shop', one of a number of web-based software tools offered by dunnhumby.

In addition to standard summary measures of market structure and performance (e.g. sales by volume and value, customer penetration, average weight of purchase, average price and frequency of purchase), the 'Shop' provides a means of profiling consumers through the use of a segmentation tool which offers up to seven different ways of segmenting supermarket shoppers, three of which (lifestage, lifestyle, region) are routinely used in the analysis of fresh produce. Table 1 shows the distribution of the different segments amongst Tesco shoppers.

In attempting to illustrate the potential value of this information to growers and packers, the analysis undertaken draws on the output from two reports available through the 'Shop' – 'Key Measures' and 'Who buys my brand'. The former generates the key statistics with respect to market structure and performance and the latter reveals how the market for different products is segmented, which is a critical stage in the process of developing effective marketing strategies and promotional plans and the identification of market opportunities for future development.

A detailed explanation of the different types of output and terms used is presented in Appendix B.

Table 1 – Distribution of shopper segments

Segmentation	% of Tesco shoppers
Region:	
London	21
Midlands	15
Lancashire	12
Southern	11
Wales and the West	9
East England	9
Yorkshire	7
Central Scotland	5
South West	4
North East	3
Northern Ireland	2
Northern Scotland	2
Borders	1
Lifestage	
Mixed	28
Older Families	16
Younger Families	16
Young Adults	15
Older Adults	14
Pensioners	10
Lifestyle	
'Mainstream' - have broad tastes, favour established brands and are influenced by the needs of their children	25
'Convenience' - regard food as fuel, are busy and rely heavily on the microwave	21
'Price sensitive' - look primarily for value and rely on staple foods	17
'Finer Foods' - are time conscious, enjoy luxury products and are willing to experiment	16
'Traditional' - enjoy the art of cooking but tend to rely on a fixed shopping list so less susceptible to impulse purchases	11
'Healthy' - are interested in organic, environmental benefits, low fat/sugar and calorie conscious	10

Results

The delivery of nine sector-level reports and responses to requests for information from numerous individual businesses makes it difficult to draw specific conclusions from the activities undertaken during the course of this first year. However, the following points, extracted from the sector-level reports, provide a flavour of the kind of insights that have emerged thus far from the analysis of the dunnhumby data with respect to fruit and vegetables.

Mushroom Growers Association

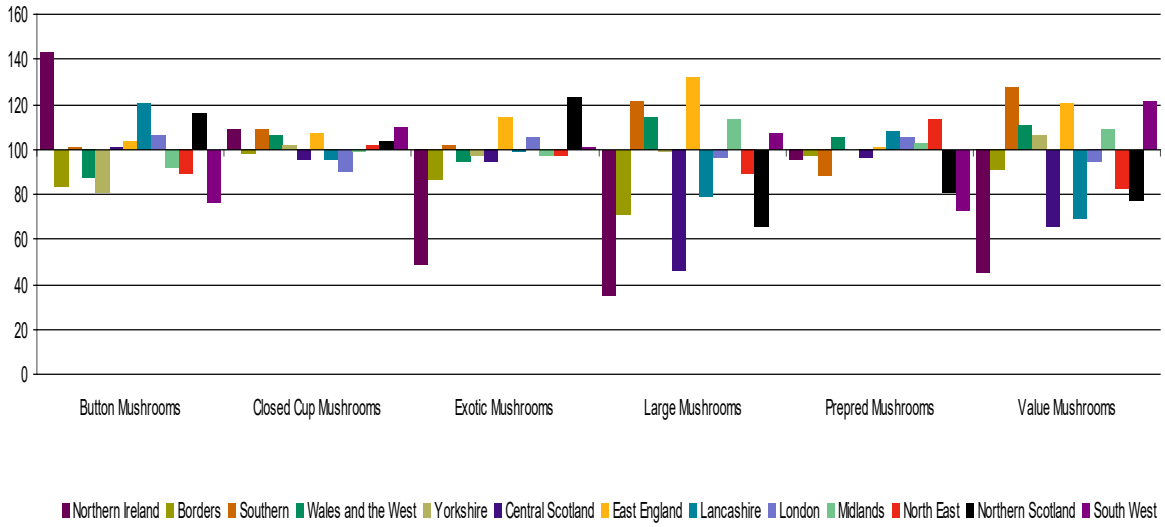
Mushrooms of all types to appeal families, young and old, but under-perform consistently amongst pensioners and, to a lesser extent, older adults.

From a lifestyle perspective, the consistent over-indexation of 'finer foods' and 'healthy' shoppers for all types of mushrooms, suggests that mushrooms enjoy a positive image with

respect to taste and healthiness, making them less dependent on price as a mechanism for market development.

Across the country, there is significant variation in the performance of mushrooms, as illustrated in Figure 2. The data is presented in index form with 100 representing the average number of supermarket shoppers across the UK as a whole who have purchased mushrooms at least once during the period. This level of regional variation is not uncommon across the fresh produce category, suggesting that consumer preferences differ significantly across the country.

Figure 2 – regional indexation of mushroom purchases, 52wks, 06.03.06 to 04.03.07*



For example, shoppers in the North West (Lancashire) are 20% more likely than the average UK shopper to purchase button mushrooms but 20% less likely to buy large mushrooms and 30% less likely to buy value mushrooms. In contrast, shoppers in the East of England over-index across the board but are most likely (30%) to buy large mushrooms, whilst shoppers in Northern Ireland under-index across the board, except for button mushrooms, for which they over-index the most (40%).

This (significant) variation warrants further research, as it represents a considerable opportunity for market development if the underlying reasons can be identified and exploited through targeted PR and/or marketing activity.

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Having presented an overview of carrot purchasing behaviour to the BCGA marketing committee in September 2006, a set of follow-up questions was submitted and a further, more detailed report was presented in January 2007, the purpose of which was to assist the BCGA with the identification of specific target groups for their PR campaign.

One of the (many) questions to which the BCGA sought an answer was the profile of carrot shoppers in London, identified in the initial report as an under-performing region. Figure 3 shows the lifestage profiles and Figure 4 the lifestyle profiles of carrot shoppers in London.

Figure 3 – Lifestage profiles of carrot shoppers in London, 12 wks, 18.9.06 - 14.12.06

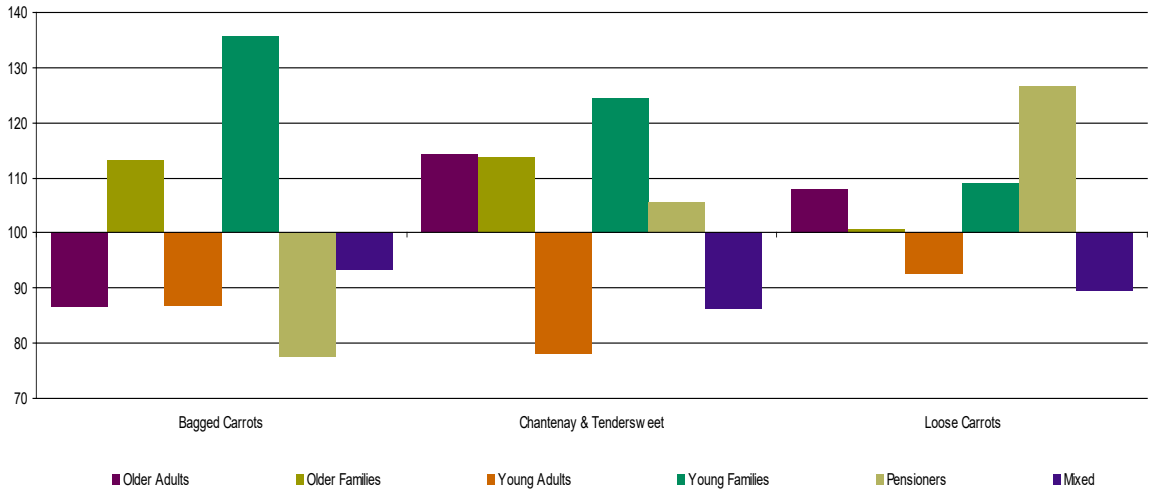
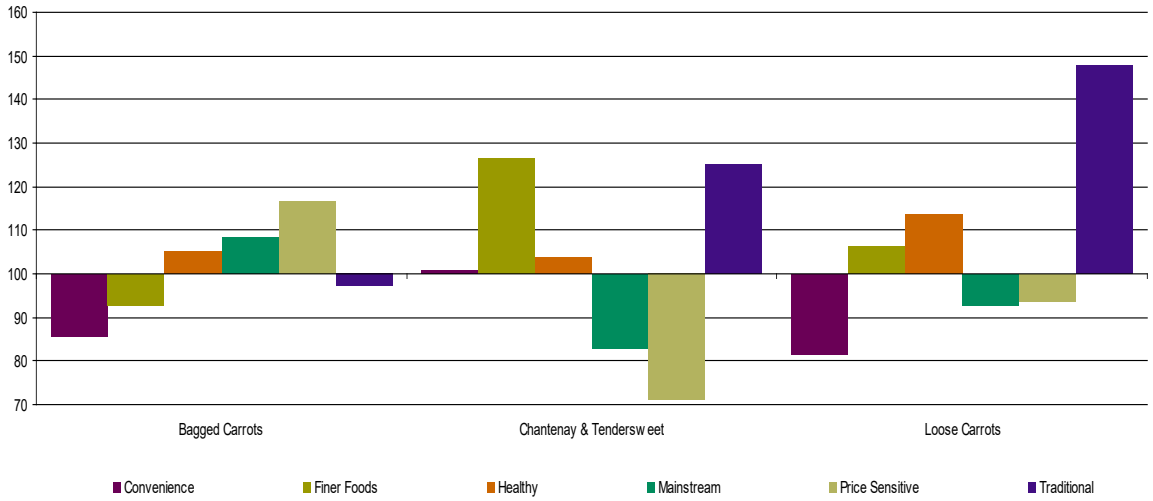


Figure 4 – Lifestyle profiles of carrot shoppers in London, 12 wks, 18.9.06 - 14.12.06



The analysis undertaken in the follow-up report indicated that amongst the supermarket shoppers in London, carrots appealed particularly to young families but under-performed, in both loose and bagged formats, amongst young adults – a key potential target group for subsequent PR activity. The analysis also revealed that whilst loose carrots appealed to 'Finer Food' shoppers, bagged carrots under-indexed, by 8%. Thus, PR effort could be warranted to tackle the possible perception of some shoppers that bagged carrots are of inferior quality (at least in terms of taste).

British Leafy Salads Association

The analysis of the key market measures for leafy salads (Table 2) revealed slow overall sales growth (1.5% from November 2005 to November 2006) but considerable variability across the category, with the mature bagged salad sector in decline but organics and

unwashed salad showing impressive growth. Moreover, with penetration at 69% (i.e. almost a third of shoppers never purchase any leafy salads) and an average rate of purchase of 10.3 times per annum (i.e. less than once per month) the poor aggregate performance hides significant opportunities for market/product development if under-performing segments can be identified and targeted.

Table 2 – Key market measures for leafy salads, 52wks, 10.10.05 – 08.10.06

Subgroup	Number of Stock Keeping Units (SKUs)	Customer Penetration (%)	Frequency of Purchase	Category Share (%)	Year on Year Sales Growth
Bagged Salad	103	51	7.1	62.2	-2.9
Iceburg Lettuce	4	36	5.2	16.3	-0.7
Speciality Lettuce	17	26	4.5	12.0	3.9
Standard Lettuce	1	14	4.4	3.3	9.8
Organic Bagged Salad	7	6	2.4	2.4	76.5
Unwashed Salad	6	8	2.8	2.2	127.9
Organic Lettuce	7	6	2.3	1.7	35.1
Total	**145**	**69**	**10.3**	**100.0**	**1.5**

The segmentation analysis revealed organic bagged salad and unwashed salad under-performing in all but four regions – London, South East, East of England and the South West – where these sectors over-indexed significantly (Figure 5). It also revealed that the fastest growing bagged salad lines appealed more to 'Finer Foods' shoppers than those that had declined the most (Figure 6), demonstrating the need for continuous innovation to avoid commoditisation of the bagged salad category.

Figure 5 - Regional indexation of leafy salad purchases, 12wks, 01.5.07 – 21.07.06

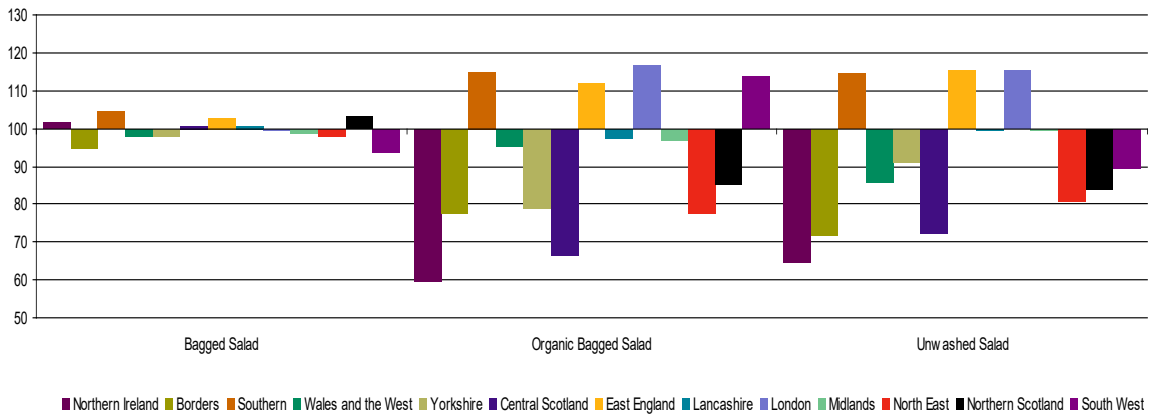
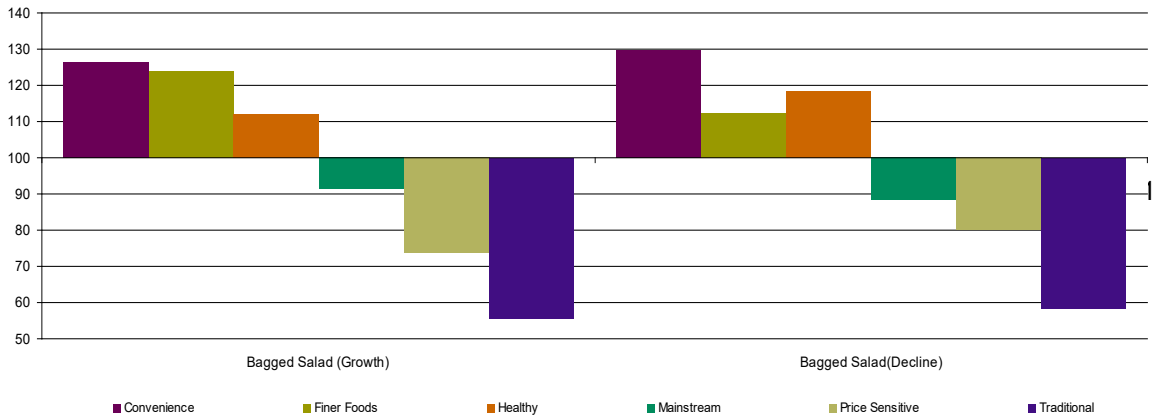


Figure 6 - Lifestyle indexation of bagged salads with the highest positive and negative growth rates, 52wks, 10.10.05 – 08.10.06



British Summer Fruit and Winter Berries

The analysis conducted for the soft fruit category included a good example of how the analysis of promotional impacts could be used to good effect by growers and packers, to a) avoid the exclusive focus on price promotions as a means of increasing sales volume and b) provide support for more effective promotional activities designed to attract new consumers (increase penetration) and promote new uses (increase the frequency of purchase).

For the purpose of illustration only, an analysis was undertaken of a blueberry promotion during the summer of 2006. The price was cut by a third and, in the absence of more detailed insight, the promotion might have been regarded a success from a retail perspective (volume sales rose by 48% during the promotion) but a failure from the suppliers' perspective (value sales rose by just 1%). The simplistic conclusion hides a more complex reaction amongst shoppers, the insights from which could be used to support more carefully targeted initiative in the future.

Despite the meagre increase in sales value, the promotion resulted in a 52% increase in customer penetration (i.e. it encouraged trial) but a decline in the rate of repeat purchases and units per customer, suggesting that the first-time experience for some of the trialists was not as positive as it needed to be to induce repeat purchases, even during the promotion, which ran for a period of three weeks. Furthermore, analysis of the consumer profiles before, during and after the promotion revealed that the promotion attracted pensioners and young adults but did not appeal to young families (Figure 7). There was a minor impact on the lifestyle profiles – a small increase in 'healthy' shoppers and small decline in 'Finer Food' shoppers (Figure 8) but, as is often the case, a significant impact in the regional distribution of shoppers, with the promotion drawing in (and retaining) shoppers in the North East, Yorkshire and Northern Scotland but proving less attractive to shoppers in London and the South East (Figure 9).

None of these segments (lifestage, lifestyle or region) were given a specific reason (e.g. recipe idea, meal occasion, serving suggestion), other than the reduced price, to purchase blueberries) but the differential impact of the promotion, revealed by the analysis of the dunnhumby data provides strong evidence of the need for a more targeted approach, if the opportunities for market/product development are to fully exploited.

Figure 7 – Lifestage indexation of blueberry shoppers, before, during and after the promotion (August 2006)

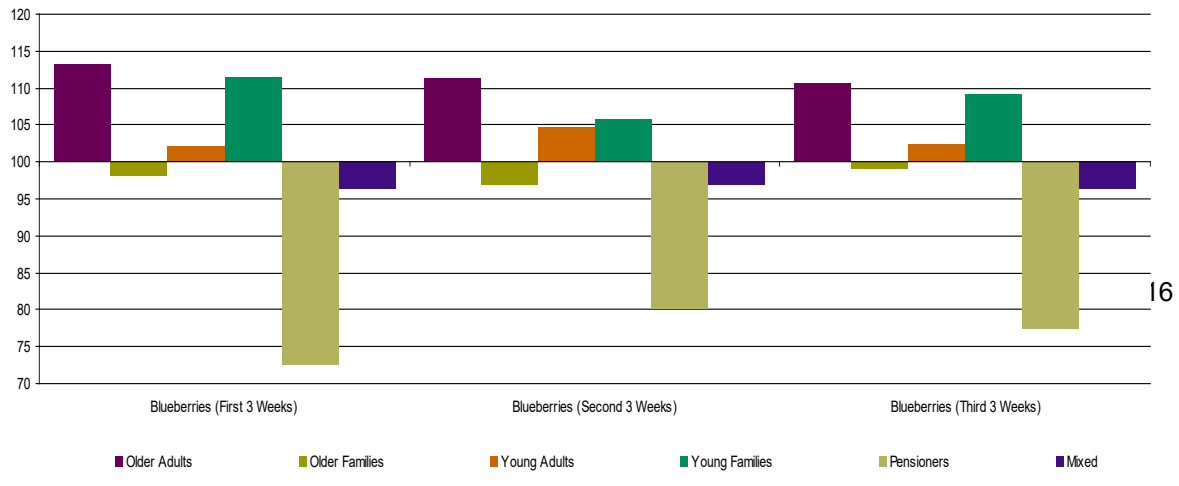


Figure 8 – Lifestyle indexation of blueberry shoppers, before, during and after the promotion (August 2006)

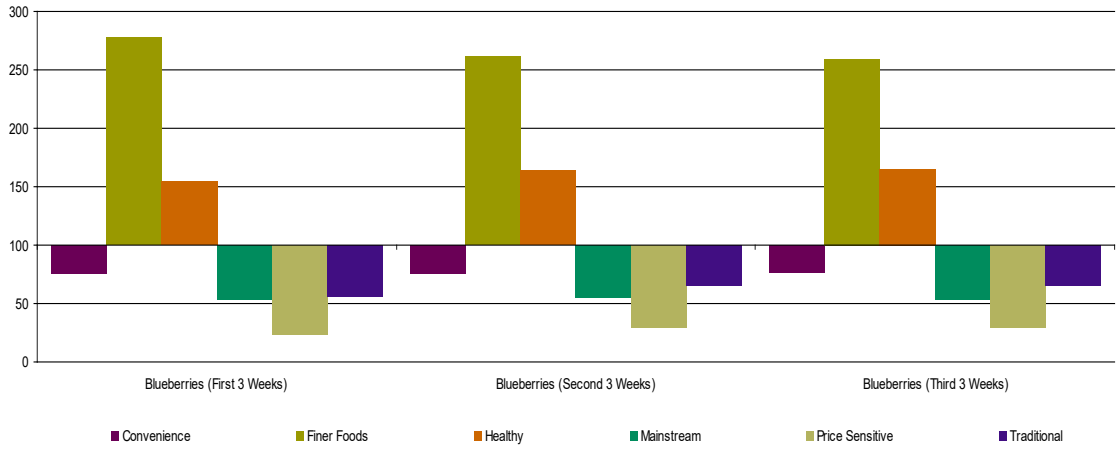
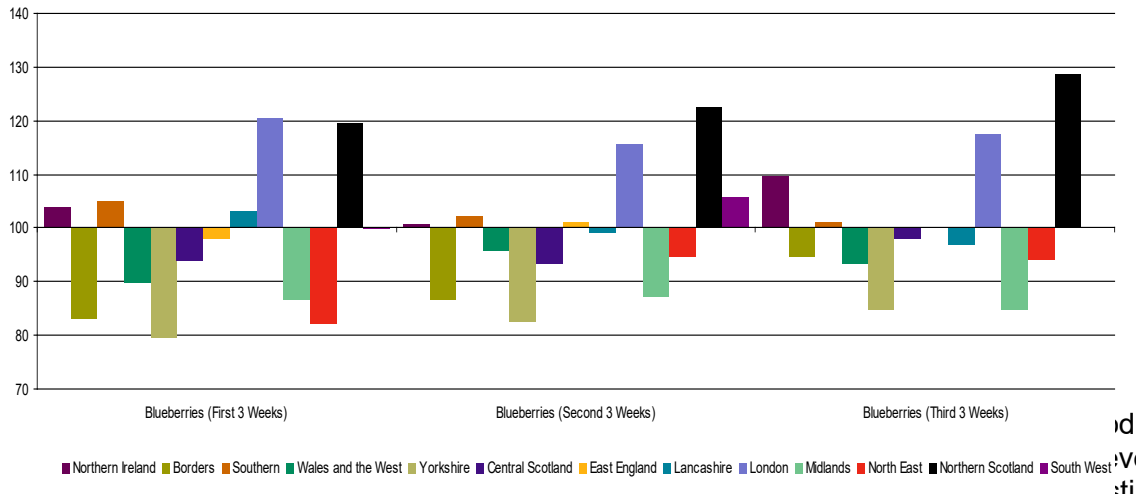


Figure 9 – Regional indexation of blueberry shoppers, before, during and after the promotion (August 2006)



attributes, new packaging formats, innovative merchandising, marketing and PR is a different challenge and one that many individual businesses will struggle to overcome. However, the likelihood of developing innovative new products and processes that deliver sustainable competitive advantage is greatly increased if the decision-making process through which these emerge is informed by consumer insight. Thus, the value of this research lies not in the analysis but the consequential action and impact thereof. There is

clearly a time lag between the provision of information, consequential action and business impact. The hope is that in years two and three of this project we will be able to gather evidence of the action taken by individual businesses and representative organisations and the impact thereof on their respective market sectors and business profitability.

Technology transfer

The following presentations have been made at grower events during the course of the first year of the project:

- April 06: Henry Doubleday Research Association – organics conference, Coventry
- Nov 06: British Soft Fruit Association – annual conference, Birmingham
- Nov 06: Food Chain Centre – 'Hortbench' seminar, Cambridge
- Jan 07: Brassica Growers Association – AGM, Kings Lynn
- Feb 07: Horticultural Trade Association (HTA) – marketing conference, Sutton Coldfield
- Feb 07: Department of Agriculture and Rural Development (DARD) – horticultural industry seminar, Belfast
- Mar 07: British Leafy Salads Association – AGM, London

The following press articles have been published during the course of the first year of the project:

- Article published in the Kent Messenger, May 2006
- Article published in the Financial Times, July 2006
- Special feature on the dunnhumby Academy published in Famers Weekly, October 2006
- Progress report published in HDC News in May 2007.

Appendix A – Draft outline of PhD research

'An investigation into the factors which influence the fruit and vegetable purchasing behaviour of pregnant women'

Kathryn Refausse

Background

There is a growing body of compelling evidence to suggest that foetal nutrition has powerful programming effects on the long-term development and health of the child, which extends well into adulthood and old age, (Dörner 1975, Barker 1998, Lucas 1991, Koletzko et al 2005, Delisle 2002, Scmidt 2000, Van de Weyer 2005). The essence of this theory is described by Godfrey and Barker (2000) as the 'foetal origins hypothesis' which proposes that alterations in foetal nutrition and endocrine status during pregnancy, cause the foetus to make adaptations that permanently change its structure, physiology and metabolism.

It is such programming which predisposes individuals to cardiovascular, metabolic and endocrine disease in adult life. It is important to note that researchers such as Barker (1998) conclude that programming in industrialised societies such as in the UK, contributes specifically to increased risk of particular chronic diseases such as cardio-vascular disease, type 2 diabetes and syndrome X. There is also evidence that obesity too, is a postnatal price to pay for foetal adaptation to suboptimum nutrition, (Delisle 2002). In line with researchers such as Blades (1998), it can therefore be argued that it is important to ensure that pregnant women eat the correct diet for the very specific development needs of their developing offspring.

There is evidence to suggest that the diets of pregnant women in the UK are lacking. For example, pregnant women are advised to eat a diet rich in fruit and vegetables aiming for a minimum of 400g or at least five portions of fruit and vegetables each day, in order to provide essential vitamins, minerals and fiber for the health of both mother and developing foetus, (Burningham et al 2007). However, according to The World health Organisation (Robertson 2004), the average UK consumer eats only 200 grams of fruit and vegetables per day instead of the recommended 400g. Furthermore, since the first national food survey, carried out by DEFRA (2002), there has been an alarming decline of 34% in UK vegetable consumption and data from the latest National Diet and Nutrition Survey (NDNS) for adults shows that, across the UK, a mere 13% of men and 15% of women meet the consumption target (Hoare 2004).

Delisle (2002) argues that poverty and marginalisation, are highly important factors in the likelihood of one being at risk of suffering from the effects of foetal programming. It is these factors that are often overlooked in the debate on the impact of foetal programming. Delisle goes on to argue that the atherogenic lifestyle patterns, originally developed in wealthier sectors of western society, have now spread to the poorer sectors of society. The wealthier have largely switched to 'healthier lifetyles' whilst the poor continue with diets generally low in fruit, vegetables and fibre. Following this hypothesis, it would be logical to argue that there is a strong likelihood that the diets of pregnant women from these vulnerable groups, could be putting their unborn baby's health at risk of developing future disease.

Why people eat what they do is a deceptively complex question (Blades 2001, Murcott 1998, Pollard, Kirk and Cade 2002), particularly in the context of modern industrialised societies. Food choice is made up of an intricate set of overlapping factors including social, cultural, psychological, economic and psychosocial (Murcott 1998, Shepherd 1999, Shepherd 2005). People must eat to live and as Murcott argues, food choice in modern western societies has actually '...very little to do with hunger, nutrition and health or even the food itself.' (1998, p97).

Therefore in order to tackle the study of this field, a multidisciplinary social sciences approach will be required. Specific pregnancy food choice literature is limited, yet points to the fact that the food choice process may be complicated further by for example, the physical state of 'being pregnant' (Anderson 2003). Research will be needed to show if this is indeed the case.

Research Objectives

This research aims to identify the factors that determine the supermarket purchases of pregnant women in the UK. The results of this research will enable health policy makers, food retailers and suppliers to develop marketing and merchandising strategies to encourage pregnant women to eat the correct diets in order to encourage optimum foetal nutrition.

Research Methods

1) Literature Review
The literature review will comprise two stages. The first will involve a brief overview of the key literature covering foetal programming and, where necessary and feasible, conduct interviews with researchers in the field – to identify key food groups and links to foetal programming.

The second will involve a more detailed review of the literature concerning food purchasing behaviour – with the aim of developing an appropriate conceptual framework for the analysis of the food choices made by pregnant women and establishing the hypotheses to be tested by the empirical research

2) Empirical Research
The empirical research will involve quantitative and qualitative analysis, undertaken in two stages. The first will involve the analysis of the dunnhumby database. This database describes the purchasing behaviour of 1.2 million UK customers and is 600 times more detailed than its nearest rival (Shopping the Supermarkets 2007). The purchasing behaviour of pregnant women will be analysed by 'Lifestyle', 'Regional' and geo-demographic segments, in the hope that this will reveal differences in purchasing behaviour. The reasons for which may be linked to marketing and merchandising initiatives, information campaigns, media advertising and the introduction of new products.

Pregnant women are not directly identifiable within the dunnhumby database. However, it is possible to identify supermarket shoppers who are likely to fall into this segment in two ways:

- Tesco have a number of affinity clubs, one of which is specifically for 'Mothers and Babies'. It is assumed that some of the members of this club will be

expectant mothers. Focusing the analysis of the dunnhumby data on this specific group will serve the purpose of filtering out those shoppers (the majority) with little or no interest in foetal nutrition or whose food purchasing behaviour is in no way related to pregnancy or post-natal 'drivers'.

- Through the analysis of shopping baskets containing key indicator products, pre and post-natal.

The dunnhumby database permits the analysis of shoppers (lifestyle, regional and geo-demographic segmentation) as well as the composition of their shopping baskets over an extended period (up to two years). Thus, it should be possible to track the purchasing behaviour of shoppers before, during and after pregnancy and explore how their purchasing behaviour changes.

This analysis will determine the purchasing behaviour of supermarket shoppers at different stages of motherhood but it will not explain why. This will be the task of stage two.

Using the findings obtained from the literature review and the analysis of purchasing behaviour from the Dunnhumby database, the second stage of the empirical research will involve qualitative research, in the form of focus groups, the aims of which will be twofold:

- To explore the factors that influence food purchasing behaviour before and after childbirth
- To identify alternative methods of communicating the importance of foetal nutrition in different ways to different groups of target shoppers (pregnant women) to increase their nutritional awareness and increase the likelihood of them purchasing food with the appropriate nutritional balance

The number and composition of the focus groups will be determined by the analysis of the dunnhumby data, which should reveal categories of shoppers (ie lifestyle, regional, geo-demographic segments, pre and post-natal) who appear to exhibit distinctly different food purchasing behaviour. Participants will be recruited through dunnhumby, who can identify individuals with specific household characteristics (ie geo-demographics) as well as shoppers who have purchased distinct combinations of food products.

Benefits

This research will be completely original and will fill the gap in the existing body of knowledge in food choice studies, which to date has relied on self-reporting methods of data collection (with its accepted limitations).

The results will be used to inform key stakeholders and decision makers in the food industry – namely retailer and food manufacturers, those responsible for food policy, food marketing and health educators.

Timetable

The following timetable envisages the transfer from MPhil to PhD taking place in November 2007, with final submission of the thesis anticipated in March 2009.

- August-October 2007 – Complete literature review (foetal nutrition and food purchasing behaviour), establish conceptual framework and research hypotheses
- November 2007 – Submit transfer report
- December 2007 – May 2008 – Conduct analysis of dunnhumby data
- June– Conduct initial set of (summer) focus groups)
- July-August – Complete analysis of initial focus groups
- Sept-Oct – Conduct second set of (winter) focus groups
- Nov-Dec - Complete analysis of initial focus groups
- Jan-Feb 2009 – Complete first draft of PhD thesis
- March – Submit PhD thesis for examination

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Appendix B – Glossary of Terms

Customer penetration = Percentage of households that have purchased at least one of the products specified at least once during the specified time period, scaled up in proportion to the total number of households with Tesco Clubcard in the specified region.

Frequency of purchase = No. of visits/No. of customers, scaled up in proportion to the total number of Tesco Clubcard holders in the specified region.. This statistic tells you how many times, on average, the specified product was purchased over the specified time period in the specified region.

Indexation of shopper segments

Over-indexing implies that a product range/category appeals to a particular segment (i.e. they are more likely to purchase), under-indexing implies that a product range/category is unattractive to a particular segment (i.e. they are less likely to purchase). For example, if a segment over-indexes by 10% it means the proportion of consumers purchasing the product who belong to that segment is 10% larger than the share of that segment in the population of UK supermarket shoppers as a whole.

The under and over-indexing of different segments can be used in numerous ways to assist product development, marketing and merchandising. Essentially, over-indexing indicates the types of shoppers most receptive to the product(s) in question whilst under-indexing indicates groups of shoppers that are less attracted to the product(s) in question. Information about the former can be used for developing new products for similar types of shoppers, in existing or new markets, whilst information about the latter highlights gaps in the market that may warrant further investigation to discover which elements(s), if any, of the marketing mix (product, price, promotion, distribution) could be modified to attract more people from those segments that are currently 'under-performing' relative to the average Tesco shopper.

If all Tesco shoppers purchased more or less the same products then the index numbers for the different segments would be close to 100 and there would be little opportunity for market segmentation, which is critical to achieving sustainable competitive advantage, competing on attributes other than price alone. Thankfully, this is not the case – shoppers have very different attitudes, perceptions, habits and preferences, the understanding of which is an essential ingredient for successful marketing. However, discerning where the points of difference are, their significance and the reasons behind them is not a simple task. The analysis of these reports sheds unique and invaluable light on many questions relating to product development, marketing and merchandising but rarely provides all the answers. As with all consumer insight, the reality is a complex jigsaw which in most cases is rarely completed in full, but the more we can see of the final picture the easier it is to see where different pieces of the jigsaw fit.