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UCC
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Market-oriented New Product Development of Functional Beverages



A dissertation presented to the Department of Food Business and Development,
National University of Ireland, Cork,
In complete fulfilment of the requirements for the
Degree of Ph.D.

by

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Douglas J. Sorenson

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"All men can see the tactics whereby I conquer, but what none can see is the strategy out of which victory is evolved, the peak efficiency of knowledge and strategy is to make conflict unnecessary"

Sun Tzu*, 544 – 496 BC (Giles, 1910)

* A collection of essays titled "*The Art of War*" is attributed to Sun Tzu, a Chinese General from the Chou Dynasty. Sun Tzu's philosophy on strategy and warfare has been applied to sports, diplomacy and the conduct of modern warfare. Sun Tzu's principles on knowledge and strategy have also been applied to business management strategies in both Japan and the US since the 1970s.

Abstract

Strategic reviews of the Irish Food and Beverage Industry have consistently emphasised the need for food and beverage firms to improve their innovation and marketing capabilities, in order to maintain competitiveness in both domestic and overseas markets. In particular, the functional food and beverages market has been singled out as an extremely important emerging market, which Irish firms could benefit from through an increased technological and market orientation. Although health and wellness have been the most significant drivers of new product development (NPD) in recent years, failure rates for new functional foods and beverages have been reportedly high. In that context, researchers in the US, UK, Denmark and Ireland have reported a marked divergence between NPD practices within food and beverage firms and normative advice for successful product development. The high reported failure rates for new functional foods and beverages suggest a failure to manage customer knowledge effectively, as well as a lack of knowledge management between functional disciplines involved in the NPD process. This research explored the concept of managing customer knowledge at the early stages of the NPD process, and applied it to the development of a range of functional beverages, through the use of advanced concept optimisation research techniques, which provided for a more market-oriented approach to new food product development.

A sequential exploratory research design strategy using mixed research methods was chosen for this study. First, the qualitative element of this research investigated customers' choice motives for orange juice and soft drinks, and explored their attitudes and perceptions towards a range of new functional beverage concepts through a combination of 15 in-depth interviews and 3 focus groups. Second, the quantitative element of this research consisted of 3 conjoint-based questionnaires administered to 400 different customers in each study in order to model their purchase preferences for chilled nutrient-enriched and probiotic orange juices, and stimulant soft drinks. The in-depth interviews identified the key product design attributes that influenced customers' choice motives for orange juice. The focus group discussions revealed that groups of customers were negative towards the addition of certain functional ingredients to natural foods and beverages. K-means cluster analysis was used to quantitatively identify segments of customers with similar preferences for chilled nutrient-enriched and probiotic orange juices, and stimulant soft drinks. Overall, advanced concept optimisation research methods facilitate the integration of the customer at the early stages of the NPD process, which promotes a multi-disciplinary approach to new food product design. This research illustrated how advanced concept optimisation research methods could contribute towards effective and efficient knowledge management in the new food product development process.

PART I: INTRODUCTION

Chapter 1: Introduction to the Study

1.1 Introduction

New product development (NPD) is a knowledge intensive process where the generation of new ideas and concepts requires detailed knowledge of both products and customers[1]. The multi-disciplinary nature of the NPD process therefore necessitates the generation, dissemination and management of knowledge across all functions involved in the development of new products[2]. Knowledge management is the management function that creates and manages the flow of knowledge within an organisation, and ensures that knowledge is used effectively and efficiently for the long-term benefit of an organisation (Darroch and McNaughton, 2002). The early or concept stage of the NPD process represents an extremely important stage for managing knowledge of both internal technological capabilities and external measures of customers' needs. However, a lack of focus on managing knowledge at the early stages of the NPD process can result in both product design and customer acceptance problems arising in the later stages of the NPD process, where development costs incurred can be considerably high.

The functional food and beverages market[3] represents a new and innovative category that requires high levels of knowledge management at the early stages of the NPD process. Specifically, functional foods and beverages present considerable challenges to firms in terms of identifying and developing technological 'breakthrough' products on one hand, and the marketing of science and technology to customers on the other. In fact, the high reported failure rates for new functional foods and beverages suggest that innovation management is lacking in many food and beverage firms. In particular, the high reported failure rates for new functional foods and beverages represent a failure to manage customer knowledge effectively at the early stages of the NPD process, as well as a lack of knowledge management between disciplines involved in the NPD process.

[1] In this dissertation, the "*customer*" can refer to the purchaser, consumer or end-user.
[2] The author of this dissertation was part of a multi-disciplinary NPD research group, which investigated intellectual property and market opportunities for innovative functional beverages. The multi-disciplinary NPD research group comprised of postgraduate students from the Departments of Food and Nutritional Sciences, Food Business and Development, Microbiology, and Process and Chemical Engineering, UCC, Ireland.
[3] A functional food or beverage may be defined as: "*any modified food, beverage or food ingredient that may provide a health benefit beyond the traditional nutrients it contains*" (Young, 1995).

To improve on the unsatisfactory performance of new functional foods and beverages a greater emphasis towards high levels of customer involvement and integration with the NPD process is suggested in the extant NPD literature. In this study it is argued that advanced concept optimisation research methods can facilitate the integration of the customer with the new food product development process, and enhance customer knowledge management at the early stages of the NPD process. More so, these advanced concept optimisation research methods are believed to generate valuable product design knowledge by transforming tacit customer information to explicit actionable knowledge, which can guide the new product design process in a market-oriented fashion. This in turn promotes high levels of integration between the technical research and development[4] (R&D) and marketing functions, leading to more effective and efficient knowledge management in the NPD process.

1.2 Background to the Research

New food product development is widely considered an essential strategic orientation for the future growth and survival of firms. The importance of NPD to firms has grown in recent times with increased globalisation, high levels of competition and changing customer needs and values (Cooper and Kleinschmidt, 1994; Capon *et al*., 1992). Furthermore, high product development costs, shortened product lifecycle times, and pressure for higher margins for retailers mean NPD has become an increasingly necessary ingredient for firms seeking to remain competitive (Roberts, 1998; Freeman and Soete, 1997). Not surprisingly, researchers such as Andriesse (1994) and Bingham and Quigley (1989) stressed that innovation management was essential to successful NPD to ensure shorter lead times and total customer acceptance of new products. However, Barclay (1992a) reported divergence between NPD practices within firms and normative advice for successful product development. In particular, Bogue (2001) argued that most food and beverage firms in Ireland[5] lacked an NPD strategy, a formal NPD process, and lacked a genuine market orientation. Khurana and Rosenthal (1997) and Cooper (1993) added that many organisations also failed to implement and manage formal intelligence generation processes, and neglected the early stages of the product development process. Importantly, strategic reviews of the Irish Food Industry

[4] Research and development (R&D) refers to future-oriented, longer-term activities in science or technology (Wolinsky and Hickson, 2001).
[5] In this thesis, Ireland refers to the Republic of Ireland only and excludes Northern Ireland.

emphasised the need for firms to invest in both technological and marketing capabilities, with the functional food and beverages category singled out as an extremely important emerging market, which Irish firms could benefit from through improved innovation management (Bord Bia[6], 2005; Alimentary Pharmabiotic Centre, 2004; Department of Agriculture and Food, 2003). Health and wellness have been key drivers of NPD in the global food and beverage industry in recent years (Boyle, 2002). Leatherhead Food Research Association (2004a; 2004b) reported that functional foods and beverages had come to dominate the global healthy food and beverages market in terms of market size, value sales and NPD activities, with the global functional food and beverages market valued at US$44.5bn in 2003. In particular, Weststrate *et al*. (2002) and Shah (2001) remarked that the functional food and beverage category, with an average growth rate that ranged from 15 to 20 per cent per annum, had proved attractive to firms in comparison to average growth rates of 2 to 4 per cent per annum for the general food and beverages market.

However, Heasman and Mellentin (2001) stressed that from a marketing perspective functional foods differed substantially from conventional foods and healthy foods. For example, while healthy foods were positioned on a platform that emphasised general well-being, functional foods and beverages were positioned on a platform that linked the consumption of functional foods and beverages to a reduced risk from certain chronic conditions. According to Frewer *et al*. (2003) and Menrad (2003), this gave rise to issues of credibility and acceptability linked to customers' negative attitudes towards, and poor knowledge of, the benefits associated with functional foods and beverages. In particular, Heasman and Mellentin (2001) reported that many food and beverage firms had come to rely solely on functionality[7], and neglected other unique selling point factors such as aspects of sensory appeal or convenience, in order to gain a competitive advantage in the functional food and beverages market. In fact, Wennström and Mellentin (2003) warned that, for technology-oriented firms, a differentiation strategy based solely on functionality offered a short-term competitive advantage only.

[6] Bord Bia is the Irish Food Board with responsibility for the development of exports of Irish food, drink and horticultural products or services (Department of Agriculture and Food, 2003).

[7] In this study, functionality specifically refers to the addition of functional ingredients to foods or beverages as distinct from the general functionality of foods in relation to nutrition, physico-chemical characteristics, satiety, energy or sensory pleasure. Therefore, in this study, a food or beverage is considered functional if it has a beneficial affect on one or more target functions in the body beyond adequate nutritional effects (Diplock *et al*., 1999).

However, managing customer knowledge during the early stages of the NPD process through the use of advanced concept optimisation research techniques can assist firms overcome customer acceptance issues associated with functional foods and beverages.

1.3 Justification for the Research

The justification for this research is made on the basis of the following: the importance of the functional food and beverages category to the Irish Food and Beverage Industry; the high failure rates worldwide for new functional foods and beverages; the lack of empirical research on knowledge management processes and activities in food NPD; the lack of focus on product design and strategic marketing issues evident from previous customer studies on functional foods and beverages, as well as the neglect of concept optimisation research methods by researchers; and the potential benefits accrued from this research in terms of improving the competitiveness of Irish food and beverage firms in the global functional food and beverages market.

The functional food and beverages market has dominated the global healthy food and beverages market in terms of market size, value sales and the number of new product introductions, and has consistently been a key NPD trend for the global food and beverage industry over the last 10 to 15 years. However, Western European food and beverage firms trail their Asian and North American counterparts in terms of the number of new functional food and beverage introductions launched annually. In particular, Feeney (2002) and Longman (2001) warned that Irish and Western European firms would need to increase technical and market orientation levels in order to become competitive in the global functional food and beverages market. More so, worldwide failure rates of 70 to 90 per cent have been reported for new functional foods and beverages (Heasman and Mellentin, 2001). Not surprisingly, the divergence between normative advice for successful product development and NPD practices within Irish food and beverage firms suggests that a systematic approach to innovation management is lacking in Irish food and beverage firms (Bogue, 2001).

A large body of research has been published on the key factors for new product success, namely an NPD strategy, a formal multi-disciplinary NPD process, and market orientation. However, less attention has focused on knowledge management in NPD, and specifically, systematic process and activities that can enhance innovation and

knowledge management in the new food product development process. Also, previous customer research predominantly focused on attitudinal and socio-demographic determinants of customer acceptability of functional foods and beverages. However, these studies approached customer acceptance of functional foods and beverages in a very general manner, which could not adequately address the multi-faceted nature of customer choice. Consequently, there has been a paucity of research on customer acceptance of product-specific functional foods or beverages using advanced concept optimisation research methodologies such as conjoint analysis. Finally, the research approach presented in this study provides a blueprint for the systematic management of customer knowledge at the early stages of the NPD process, which can assist Irish food and beverage firms leverage a sustainable competitive advantage in the functional food and beverages market.

1.4 Research Question and Sub-questions

According to Leedy (1997: 46) a researcher must first articulate an acceptable problem or research question that "*is carefully phrased and represents the single goal of the total research effort*". The research question that guided this study was: *To what extent can the effective knowledge management process assist firms exploit market opportunities for functional beverages in Ireland*?

The main research question was broken down into 3 specific sub-questions:

Sub-question 1: *What are customers' expectations, requirements and preferences for functional beverages?*

Sub-question 2: *What functional beverages appeal to specific market segments?*

Sub-question 3: *Can advanced concept optimisation research methodologies contribute towards effective strategic marketing decisions for functional beverages in Ireland?*

1.5 Research Objectives

The objectives of this study were: (i) to qualitatively analyse customers' expectations and requirements for functional beverages; (ii) to identify segments that perceived value

from the addition of functional ingredients to beverages; (iii) to determine the optimal product design attributes influencing customers' choice motives for a range of new functional beverage concepts; (iv) and to evaluate the contribution of advanced concept optimisation research methodologies to knowledge management in the new food product development process.

1.6 Research Methodology

The methodology used in this study was centred on a sequential exploratory research design strategy[8], which employed a combination of research methods, to qualitatively explore, and then quantitatively measure, customers' attitudes and preferences for a range of functional beverages (Kumar, 1996). The research instrument used in this study consisted of a combination of in-depth interviews, focus groups and conjoint analysis. The sequential exploratory research design strategy was conducted concurrently to the research endeavours of the R&D personnel involved in the project, where the quantitative data and results assisted in the interpretation of the qualitative findings. The methodology employed in this research was therefore divided into two distinct elements or sections. First, the explorative element of this research investigated customers' choice motives for orange juice and soft drinks, and explored customers' attitudes and perceptions towards a range of new functional beverage concepts, through a combination of 15 in-depth interviews and 3 focus groups. Second, the segmentation element of this research consisted of 3 conjoint-based questionnaires administered to 1200 customers, that is, 400 different customers for each study, to model purchasers' preferences for chilled nutrient-enriched and probiotic[9] orange juices, and stimulant beverages[10], and for the purpose of market segmentation.

1.7 Research Framework

This study is divided into five distinct parts encompassing the primary and secondary elements of this study. Part I introduces the research topic (Chapter 1) and the conceptual framework of the study (Chapter 2). Part II presents the literature review.

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[8] The methodological research design employed in this study is discussed in more detail in Chapter 7.

[9] Probiotic cultures may be defined as: "*a microbial preparation which contains live and/or dead cells including their metabolites which is intended to improve the microbial or enzymatic balance at mucosal surfaces or to stimulate immune mechanisms*" (Reuter, 1997).

[10] Stimulant beverages may be defined as: "*beverages, which typically contain caffeine, taurine, vitamin(s), an energy source and/or other substances marketed for the specific purpose of providing real or perceived enhanced physiological and/or performance effects*" (Food Safety Promotion Board, 2002).

Chapter 3 reviews the key factors for new product success. Chapter 4 introduces the topic of market orientation and its importance to knowledge management and organisational performance in NPD. Chapter 5 examines the key product design and strategic marketing issues pertaining to functional foods and beverages. Chapter 6 then introduces the key customer and NPD trends in the global functional beverages market. Part III (Chapter 7) outlines the research methodology employed in this study. Part IV presents the results and analysis of the research. Chapter 8 presents the qualitative results derived from a series of in-depth customer interviews and focus groups. Chapters 9, 10 and 11 present the quantitative results of 3 conjoint-based studies modelling customers' purchase preferences for chilled nutrient-enriched and probiotic orange juices, and stimulant beverges respectively. Finally, Part V (Chapter 12) presents the research conclusions, outlines recommendations for stakeholders in the functional food and beverages market, and offers suggestions for further research.

1.8 Delimitations of Scope and Key Assumption

There were a number of delimitations of scope to this research. First, the importance of both market orientation and knowledge management to NPD were the main focus of this research, although the contribution of an NPD strategy and a customer-driven new product process to new product success was acknowledged in this study. Second, Darroch and McNaughton (2002) argued that the two key dimensions of knowledge management orientation, that is, information generation and information dissemination, were also closely linked to two key dimensions of market orientation. Therefore, in this research it was assumed that knowledge management was analogous to market orientation, as market information was principally generated through the primary research. However, the broader scope of knowledge management, in terms of the management of both marketing and non-marketing information, was extremely relevant to this study given the multi-disciplinary nature of the overall research project. Third, the scope of the primary research undertaken in this study extended to the first dimension, or information generation dimension, of knowledge management orientation only.

Fourth, the conjoint analysis methodology was chosen for use in this research owing to its relevance to the new product design process, as well as its extensive use by both marketing and technical R&D disciplines. Specifically, the full-profile conjoint analysis

technique using SPSS was chosen as it presented customers with realistic descriptions of alternative hypothetical beverage concepts. However, full-profile conjoint analysis using SPSS is the most restrictive of all conjoint analysis techniques in terms of studying interactions between attributes (SPSS, 2003). Therefore, although interactions between attributes, manifested as price reversals, were observed, it was not possible to study further or fully explain the phenomenon. Finally, in the secondary research the 'voice of the customer' referred to purchasers, consumers and end-users of products or services. However, a key objective of this study was to understand customers' cognitive motives for purchasing orange juice primarily, but also soft drinks, in the context of the functional beverage concepts under investigation. Consequently, in the primary research, only purchasers of orange juice, chilled orange juice and soft drinks were recruited through the sampling methodologies employed in the study. However, different preferences for orange juice, chilled orange juice and soft drinks expected among consumers and end-users of these beverages were acknowledged in this study.

1.9 Summary

This chapter introduced both the conceptual and contextual basis for the research presented in this study. Chapter 1 presented the research question, sub-questions and research objectives that guided this study. The research methodology, research framework, and the delimitations of scope and key assumption of the research were also outlined. In Chapter 2 the conceptual framework for this study is presented.

Chapter 2: Conceptual Framework

2.1 Introduction

This chapter presents the conceptual framework arising from a review of key empirical research and relevant literature on NPD and functional foods and beverages, which form the basis for this study. The conceptual framework of this study can be divided into a number of interlinking topics: NPD success factors; NPD strategy and organisation of NPD activities; knowledge management and market orientation in innovation; and market-oriented NPD of functional foods and beverages.

2.2 NPD Success Factors

Cooper (1984a) stated that NPD had become increasingly important to a firm's growth and long-term profitability as technologies, markets and customers changed. Overall, a review of the extant NPD literature revealed that an NPD strategy, a formal multi-disciplinary NPD process, knowledge management and a strong market orientation were identified as critical NPD success factors (Howley, 2002; Lynn and Reilly, 2002; Bogue, 2001; Hurley and Hult, 1998; Cooper, 1994a; Harmsen, 1994; Cooper and Kleinschmidt, 1987). However, Moorman and Rust (1999) stated that the effective management and organisation of the NPD function continued to be a problematic area for most firms, where NPD practices within firms diverged from normative advice for successful product development. In particular, researchers such as Jensen and Harmsen (2001), Bogue (2001) and Harmsen *et al.* (2000) reported that many food and beverage firms had failed to implement the key factors that could improve NPD success and organisational performance. Two key NPD success factors identified in the literature concerned the adoption of an NPD strategy, and a formal multi-disciplinary NPD process.

2.3 NPD Strategy and the Product Development Process

Lord (2000) stated that successful NPD activities encompassed the complete management and organisation of the innovation process and not merely the development and design of new products. Cooper and Kleinschmidt (1987) and Kuezmarski and Silver (1982) argued that an NPD strategy provided focus for a firm's NPD activities in terms of concept screening and evaluation of potential new products

or services at the early stages of the NPD process. Cooper (1984a) characterised firms that adopted a technology-oriented or closed NPD strategy in terms of high impact performance organisations, which encouraged creativity and risk-taking through leveraging internal technological orientations, and focused their technical development efforts more effectively. Not surprisingly, Wennström and Mellentin (2003) and Heasman and Mellentin (2001) believed that most functional food and beverage firms aggressively pursued technology-oriented NPD strategies. However, Wennström and Mellentin (2003) warned that, for technology-oriented firms, a differentiation strategy based solely on functionality offered a short-term competitive advantage only. Instead, Robinson and Jeongwen (2002) and Cooper (1984a) argued that market pioneers that were first to the market with innovative products needed to maintain a balanced marketing and technological NPD strategy. A balanced strategic orientation was considered to promote a multi-disciplinary NPD process, which was considered essential to the development of successful new products (Eisenhardt and Behnam, 1995; Cooper, 1994a; Cooper and Kleinschmidt, 1990). This multi-disciplinary approach to the NPD focused organisations on meeting customers' needs, facilitated co-ordination and knowledge sharing between technical R&D and marketing personnel, and enhanced their teams' innovation management and knowledge management systems (Hurley and Hult, 1998; Li and Calantone, 1998; Cooper, 1994b; Rothwell, 1992; Booz, Allen and Hamilton, 1982). A review of the NPD literature therefore revealed that effective knowledge management and market orientation were also key factors for new product success.

2.4 Knowledge Management and Market Orientation in Innovation

Zahay *et al*. (2004) attributed the failure of many NPD projects to the lack of appropriate information dissemination and facilitative learning, and poor knowledge management within organisations. Wiig (1997) contended that knowledge could only become an asset to a firm if it was enhanced, managed and effectively used. Therefore, Lynn and Reilly (2002), Carneiro (2000) and Dove (1999) proposed that knowledge management orientation, and the effective management of knowledge, were important antecedents to innovation, and therefore, key factors in NPD success. In particular, Song and Parry (1997) and Dewar and Dutton (1986) stressed the importance of managing knowledge more effectively in firms in order to stay close to the customer. Importantly, Kohli and Jaworski (1990) and Narver and Slater (1990) argued that the

key dimensions of knowledge management orientation, namely knowledge generation and knowledge dissemination, were also key dimensions of market orientation. In that context, Kleinschmidt and Cooper (1995) and Kohli and Jaworski (1990) argued that market orientation was the most efficient means of managing market or customer knowledge, as market-oriented firms were considered proficient at gathering and disseminating information and knowledge.

2.5 Market-oriented NPD of Functional Foods and Beverages

Khurana and Rosenthal (1997), Cooper (1993) and Cooper and Kleinschmidt (1988) maintained that most organisations failed to implement and manage formal intelligence generation processes and neglected the early or front-end stages of the NPD process. In fact, Verbeke (2004) argued that the high reported failure rates for functional foods and beverages suggested that customer acceptance issues at the early stages of the NPD process were either ignored or poorly understood by firms. In contrast, Cooper (1993) contended that customers were viewed as important co-designers in market-oriented organisations since they could make an effective contribution to product design and acceptability (Cooper, 1993). Kohli and Jaworski (1990) remarked that gathering customer information through formal concept optimisation research methods at the early stages of the NPD process resulted in information that could be more easily disseminated throughout the organisation. More importantly, advanced concept optimisation research methods facilitated closer integration between technical R&D and marketing in the product development process (Arteaga *et al*., 1994). In that context, van Kleef *et al*. (2002) believed the integration of the customer at the early stages of the NPD process could overcome confusion and uncertainty concerning new functional product concepts.

2.6 Conceptual Framework of the Research

The conceptual framework guiding this study illustrates the relationship between market-oriented NPD and knowledge management, which is strongly linked to new product success (See Figure 2.6.1). This framework illustrates how concept optimisation research methods, which integrate customer knowledge at the early stages of the NPD process, provide for a market-oriented approach to NPD. A market-oriented approach to NPD in turn promotes the effective and efficient management of

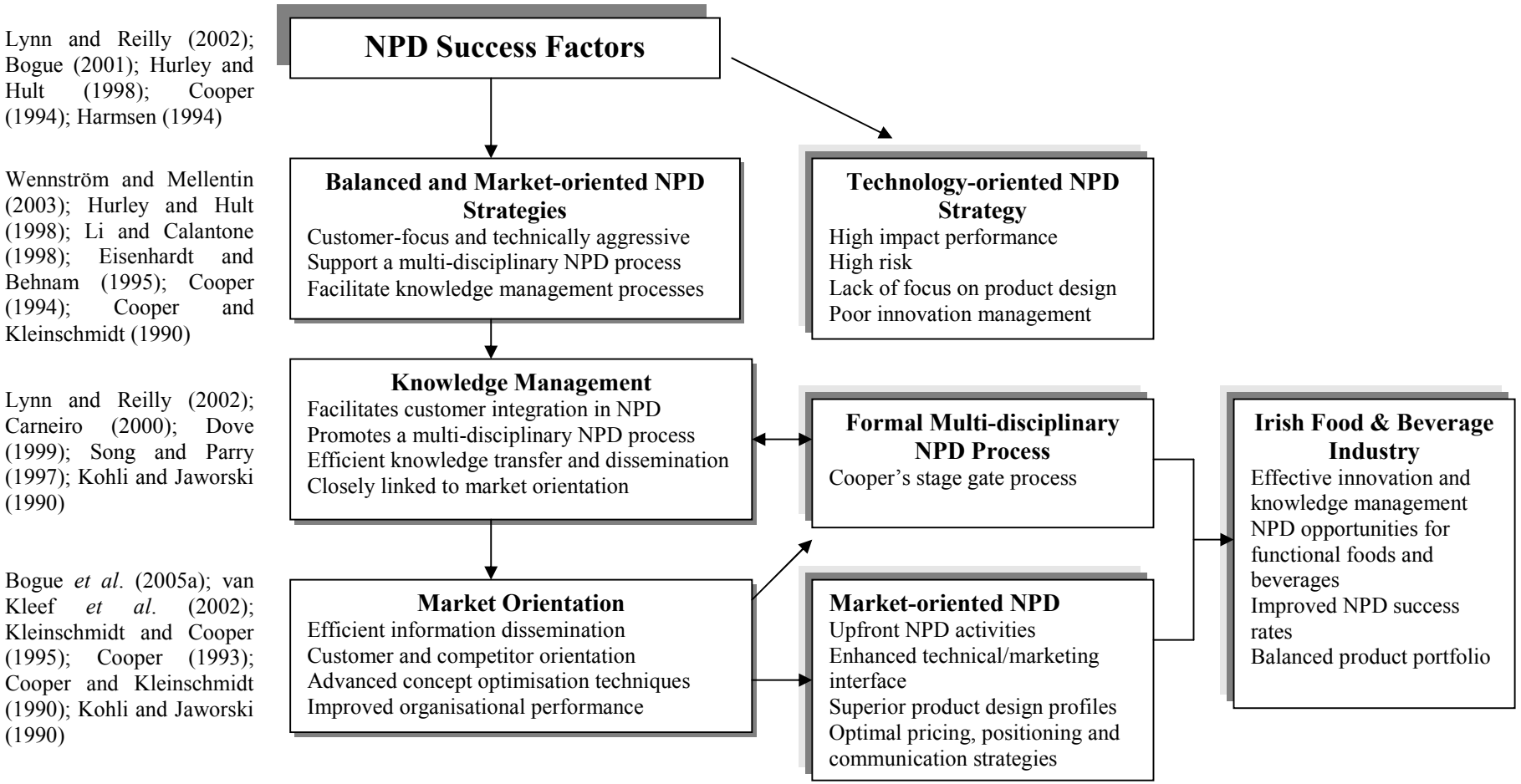


Figure 2.6.1 Conceptual Framework of the Research

customer or market knowledge within a multi-disciplinary NPD process, which is closely linked to the balanced NPD strategy necessary for new product success.

2.7 Summary

This chapter presented the conceptual framework of this research. Part II presents the literature review to this study. The literature review begins with the importance of NPD to improving competitiveness and overall business performance, and the key success factors pertaining to the management and organisation of the NPD function within firms are discussed.

PART II: LITERATURE REVIEW

Chapter 3: Managing and Organising New Product Development Activities

3.1 Introduction

Chapter two presented the conceptual framework that guided this dissertation, and illustrated the framework for the study. Chapter three presents a review of the extant literature pertaining to the management and organisation of the innovation function within firms. This chapter introduces the importance of innovation to improving business performance, and particularly, its importance to increasing competitiveness and new product success. Furthermore, best practice in terms of organising and managing the innovation function within firms is also investigated and discussed.

3.2 Competitiveness through Innovation

Product development is essential to the success and future of organisations. Cooper (1984a) originally argued that innovation was critically important to a firm's growth and prosperity as technology, markets, and customers changed, and competition increased. More recently, researchers such as Anderson and West (1996), Cooper and Kleinschmidt (1994) and Capon *et al*. (1992) concurred that organisations were under increased pressure from higher levels of competition, shorter product lifecycle times, and the need to satisfy increasingly sophisticated customers. Added to this are increasing NPD lead times, new emerging technologies, and increasing product development costs. Consequently, the successful management of the innovation function was identified as a necessary ingredient for organisational competitiveness (Hamel, 1998; Roberts, 1998), and an important growth factor for firms (Freeman and Soete, 1997). Shepherd and Ahmed (2000) argued that firms needed to act quickly and accurately to identify customers' needs, and develop new products in order to gain higher customer satisfaction. In particular, Bingham and Quigley (1989) remarked that although the NPD process was associated with high-risk, a low emphasis on product development would result in the deterioration of a firm's market position and competitiveness. They stressed that mature firms would be incapable of responding to competitive new product introductions in the absence of NPD. More worryingly, late

entry to the market, as a consequence of a reactive approach to NPD, could result in low market share in new markets, or loss of market share in existing markets. Indeed, Andriesse (1994) argued that time had become increasingly important for organisational competitiveness and profitability as a result of shorter product lifecycles. In contrast, Bingham and Quigley (1989) maintained that the early introduction of new products facilitated long-term market dominance by firms, and detracted the entry of competitors into those markets.

NPD is now considered an integral element of a firm's business activities. Specifically, NPD helps to diversify risk and provides a more balanced product or brand portfolio. For example, many of the world's leading firms such as 3M and Johnson and Johnson consider innovation a corporate asset, and possess a balanced portfolio of both low and high-risk new products (Kanter *et al*., 1997). Davis and Kristin (1997: 338) argued that successful firms accepted that in innovation "*risks are inherent, failure is okay, rewards and recognition are critical, and senior management involvement enhances innovation efforts*". They concluded that only through the development of an innovation culture could a firm become successful. In that context, the importance of NPD to organisational performance is also highlighted by the increasing reliance on new products to generate income. For example, Booz, Allen and Hamilton (1982) remarked that firms were likely to derive one third of their profits from new products in the future. Also, Deschamps and Nayak (1995) observed that firms that were leaders in their respective markets obtained over 49 per cent of their profits from product or services launched in the preceding five years. More recently, according to Cooper *et al*. (2001), approximately fifty per cent of firms' sales across sectors were derived from new products introduced in the previous five years.

Pratali (2003) outlined other benefits gained from the pursuance of an innovation strategy and these included: increased market share in existing markets; entry to growing and emerging new markets; and increased corporate medium-to-long-term profitability. Furthermore, a direct benefit from an innovation orientation related to an improvement in the technological capabilities of firms, which was believed to substantially improve the competitive position of organisations through meeting market demands for new products or services. Furthermore, McAdam and McClelland (2002) remarked that the accrued benefits from innovation and creativity transcended

sales growth, profitability and efficiency improvements, and realised social benefits from teamwork and employee motivation. In effect, Davis and Kristin (1997) maintained that innovation was considered extremely necessary to firms for long-term stability, shareholder and employee satisfaction, and leadership in the marketplace. This is particularly true in relation to the future growth and prosperity of the Irish Food Industry. The Department of Agriculture and Food (2000: 25) reported that the Irish Food Industry was under increased pressure to innovate as a consequence of factors such as: more sophisticated and demanding customers; the threat from global food companies and strong associated brands; rationalisation and globalisation of the retail sector; acceleration of NPD and shortened product lifecycle times; changes in EU trade policy; and greater segmentation of international food markets. Although NPD is considered a high-risk effort, Cooper *et al*. (2001) recall little improvement in the management of both risk and the innovation process in firms.

Strategic reviews of the Irish Food Industry emphasise the need for firms to invest in technological and marketing capabilities, in order to manage risk and enhance competitiveness (Bord Bia, 2005). For example, the Department of Agriculture and Food (2000; 1998) concluded that the Irish Food Industry needed to improve its marketing and management skills, and enhance its innovation and marketing capabilities, in order to maintain competitiveness in both domestic and overseas markets. Specifically, the Department of Agriculture and Food (2003; 2000) stated that the Irish Food Industry's R&D expenditure was low in comparison to other sectors within the economy, and argued that this would need to be addressed in order to remain competitive in the future. The Department of Agriculture and Food (2003) argued that the Irish Food Industry would need to engage in more customer-focused innovation to gain access to new markets and retail outlets. In particular, the functional food and beverages market was singled out as an important emerging market, which Irish firms could benefit from through increased technological and market orientation (Department of Agriculture and Food, 2003).

Bogue (2001) reported that retailers had become more proactive in NPD than food and beverage firms in order to differentiate themselves from competitors, be first to introduce products to market, and ultimately, move up the value chain. In particular, Mintel (2003; 2002a; 2001a) reported that the leading retailers in the UK were more

heavily involved in product development than their European counterparts, with a faster stream of new own-label branded products introduced onto supermarket shelves to entice UK customers. From the manufacturer's perspective, the Department of Agriculture and Food (2003) concluded that the need to stay ahead of the competition meant product development was increasingly important to firms in terms of differentiated product offerings, which shifted the emphasis away from price-related issues, and added value to customers. Furthermore, the Department of Agriculture and Food (2000) added that product development also helped reinforce brand image, created further distance between competitor brands, and prevented market penetration by own-label brands. Indeed, the Department of Agriculture and Food (2000: 27) maintained that Irish food manufacturers, and own-label suppliers in particular, had come under increased pressure from retailers to "*innovate rapidly, anticipate future trends and help the retailer to differentiate itself from its competitors*". Overall, while innovation and marketing capabilities have been identified as important to the competitiveness and profitability of firms, it would appear that the management and organisation of the product development function remain problematic areas for firms across sectors, and barriers to successful innovation management have been identified.

3.3 Barriers to Successful Innovation

The domination of product development in business has arisen from recognition that creativity in innovation can lead to companies gaining a competitive advantage (Porter, 1980). However, the increasingly competitive nature of business, coupled with changing customer and market dynamics, has made the innovation process a complex, costly, and risky process. Notwithstanding this, product development remains an integral part of an organisation's activities for business survival and growth. However, the effective management and organisation of the NPD function remain problematic areas and organisations find it increasingly difficult to internalise innovation capabilities (Moorman and Rust, 1999). More worryingly, Jensen and Harmsen (2001) believed that few organisations had implemented a range of factors that could improve NPD success and organisational performance. Not surprisingly, the failure rates for new product introduction are high. Cozijnsen *et al*. (2000) and Asplund and Sandin (1999) concluded from their respective cross-sector industrial surveys that only twenty per cent and twenty-five per cent of new products introduced were successful in the first year. Furthermore, Traill and Grunert (1997) maintained that 90 per cent of all

new food products introduced failed within the first year. In that context, researchers have sought to identify the problems associated with the NPD process as well as the barriers to uptake of normative advice for NPD success (Biemans and Harmsen, 1995; Page, 1993; Barclay, 1992a; 1992b).

A strong argument exists for an increase in NPD investment by firms. Specifically, it is argued that firms that invest resources in NPD benefit from increased innovation outputs. Not surprisingly therefore, innovation intensity is considered extremely important to both innovation output and NPD success (Page, 1993). Strategic reviews of the Irish Food Industry have stressed the importance of investment in innovation. For example, The Department of Agriculture and Food (2000) stressed that the level of R&D in the Irish Food Sector was low in contrast to other sectors in Ireland, and within the European Food Industry. Harmsen *et al.* (2000) also argued that levels of expenditure in product development in the food industry were low in comparison to other industrial sectors. More recently, CORDIS[11] (2004) reported that innovation played a vital role in the competitiveness of the pharmaceutical and electrical sectors, and a less important role in textiles and food products. This conclusion was based upon an evaluation of both innovation expenditure[12] and R&D expenditure[13] across sectors in Western Europe. Specifically, the electrical sector yielded the highest innovation and R&D expenditures of 9.17 per cent and 14.45 per cent respectively, while the food industry yielded the lowest innovation expenditure (1.19%) and second lowest R&D expenditure (1.37%) in Western Europe. Furthermore, a major barrier to innovation relates to the absence of an NPD strategy in firms.

A NPD strategy is considered essential for successful NPD as it provides direction to firms in selecting new products to develop and new markets to serve. Cooper and Kleinschmidt (1987), Cooper (1984a) and Kuezmarski and Silver (1982) emphasised the importance of a well-defined and focused product development strategy to successful NPD and business performance. In particular, Johne and Snelson (1990) remarked that a proactive strategic approach to NPD was more desirable than a reactive approach to NPD as it allowed firms to obtain product leadership in the

[11] CORDIS is the European Community's research and development information service.
[12] Innovation expenditure is defined as the percentage of innovation expenditures in a specific sector and total turnover in that sector (CORDIS, 2004).
[13] R&D expenditure is defined as the percentage of all R&D expenditures in a specific business sector and total value-added generated in that sector (CORDIS, 2004).

marketplace, and simultaneously facilitated a balanced NPD strategy. Cooper's (1984b) investigation of the relationship between NPD strategy and business performance revealed that firms with a balanced portfolio, that is, both technologically and market-oriented, were also the highest organisational performers. However, Page (1993) maintained that firms seldom took a proactive approach to NPD. Furthermore, although an NPD strategy was considered important for new product success, Page (1993) maintained that only 50 per cent of industrial firms sampled had an NPD strategy in place. Indeed, Bogue (2001) also reported the absence of an NPD strategy in twenty-five food firms surveyed in Ireland. The absence of an NPD strategy was also linked to poor organisation of the NPD process where Booz, Allen and Hamilton (1982) believed that a balanced NPD strategy created a climate for synergies between technical R&D and marketing personnel. The lack of a formal NPD process has therefore been cited as a further barrier to innovation.

Edgett (1994) maintained that a formal NPD process was more prevalent in successful firms than in less successful organisations. However, there was considerable agreement in the literature that the organisation of NPD activities in firms was inadequate, and researchers such as Hart and Baker (1996) and Barclay (1992a) alluded to difficulties encountered by firms in relation to the organisation of the NPD process. For example, Hart and Baker (1996) recounted that 87 per cent of industrial firms surveyed lacked a formal NPD process, and 72 per cent of these firms considered their compartmentalised NPD activities a further barrier to successful NPD. Indeed, Barclay (1992a) recounted divergence between NPD practices within firms and normative advice for successful product development. Specifically, an evaluation of the NPD activities in 149 companies revealed that only one company based its product development process on best practice in terms of organisation of the NPD function. Larson and Gobeli (1988) also found that only 20 per cent of NPD managers surveyed had implemented a formal NPD organisational structure. In particular, a formal multi-disciplinary NPD process has been identified as a critical NPD success factor.

Rothwell (1992) argued for the adoption of multi-functional teamwork and inter-departmental co-ordination, which focused organisations on meeting customers' needs, and also enhanced the technical capabilities of firms. In particular, the adoption

of a concurrent NPD process model that encouraged inter-departmental co-ordination and teamwork was associated with relatively high success rates in product development (Kleinschmidt and Cooper, 1995). However, Hart and Baker (1996) warned that there were a number of problems associated with the multi-functional approach to NPD which needed to be addressed such as: allocation of resources at the earlier stages of the NPD process; performance of front-end stage activities such as idea generation, preliminary assessment and concept definition; and integration of marketing and technical R&D. Cooper (1994a) concluded that the failure to implement multi-functional teams could be attributed to entrenched cultural values, a lack of project management skills, and poor departmental communication. In particular, Lester (1998) reported that cultural resistance to multi-functional innovation arose from entrenched routines and interpretive barriers. This, Lester (1998) believed resulted in employees that focused solely on their own tasks and responsibilities, and where barriers arose when group solutions were sought beyond their own responsibilities. For example, Rochford and Rudelius (1997) found that over sixty-six per cent of industrial firms surveyed reported a lack of mutual trust between functions, which hampered inter-departmental co-ordination. Also, Souder (1988) found that inter-departmental competition for resources had a negative impact on innovation capabilities due to disharmony within firms. In that context, the presence of a product champion within a multi-functional team is considered critical to the NPD process. However, Page (1993) recounted that only 40 per cent of firms surveyed encouraged a product champion within the process, which was attributed to a lack of senior management support. Overall, Cooper (1993) remarked that firms invariably failed to implement a multi-disciplinary approach to product development, and argued that a greater effort to promote inter-departmental co-ordination was crucial to new product success.

Finally, a further barrier to innovation that was reported by Calantone *et al*. (1993) and Booz, Allen and Hamilton (1982) referred to customer involvement in the NPD process. Calantone *et al*. (1993) and Booz, Allen and Hamilton (1982) argued that although customer involvement in the NPD process was critical to success, firms had failed to conduct adequate market research. Hoopes (2001) found that organisations that emphasised the later stages of the NPD process neglected the more important early stages of the NPD process. Not surprisingly, Andriesse (1994) found that 40 to

50 per cent of NPD time generally spent on R&D involved reworking new product concepts. Wind and Mahajan (1988) further remarked upon the divergence between normative advice and implementation of NPD success factors in firms. Specifically, Wind and Mahajan (1988) argued that organisations neglected critical stages of the NPD process, and the early stages of the NPD process in particular, in order to quickly bring new products to the marketplace. Indeed, Edgett (1994) also reported that NPD managers that were unsuccessful at NPD often skipped or rarely engaged in research at the early stages of the product development process. Strategic reviews of the food sector generally have repeatedly impressed upon the benefits to firms from the adoption of market orientation in business. However, Bogue (2001) and Grunert *et al*. (1996) argued that the level of market orientation in the food sector was still low. Notwithstanding the difficulties that organisations engaged in innovation encounter, there is a clear need for the adoption of the key factors for new product success by firms.

3.4 Factors for New Product Success

Numerous researchers have sought to identify the most important factors that contribute to new product success. For example, Cooper's (1980a) Project NewProd study which investigated 200 Canadian firms involved in innovation concluded that the three key factors for success were: the degree of product uniqueness and superiority; market knowledge and attention to future trends and developments; and a product's synergy with an organisation's technological capabilities. According to Booz, Allen and Hamilton (1982) one of the key elements of best practice for NPD success, related to a firm driven by its corporate objectives, and central to this was an NPD strategy. Indeed, Bacon *et al*. (1994) found that the adoption and implementation of an NPD strategy was closely associated with success in product development as it gave NPD teams a clear and realistic target, which was congruent with the organisation's overall business strategy. Importantly, according to Zhang and Doll (2001) the development of the NPD strategy entailed an assessment of customer needs, an analysis of competitive offerings, and an assessment of technological risks and opportunities. Lynn and Reilly (2002) and Shapiro (2000) reported that support from senior management was the cornerstone of successful innovation. Howley (2002) and Davis and Kristin's (1997) review of the extant NPD literature further revealed that the factors associated with successful product development included:

implementation of an NPD strategy; development of a new product portfolio; adoption of a market orientation, and market research in the early stages of NPD; a systematic and well-defined NPD process; the use of multi-functional NPD teams; adequate compensation incentives to stimulate an entrepreneurial environment; and recognition that failure was an intrinsic part of the NPD process.

The management and organisation of the NPD process has been cited as an important antecedent to new product success. Craig and Hart's (1992) review of the extant NPD literature revealed the most important business domains that impacted on new product success: strategic management of the NPD function; organisational structure; the NPD process; NPD personnel; and information flow throughout the organisation. In particular, Khurana and Rosenthal (1997) considered multi-functional teams extremely important to new product success, while Larson and Gobeli (1988) believed an unclear interface between functional departments in NPD and the lack of direction for team members were detrimental to new product success. However, Cooper (1993) maintained that significant problems were traditionally associated with achieving functional integration. In that context, Howley (2002), Wind and Mahajan (1988) and Cooper (1980b) advocated the use of external consultants and product champions as central in the organisation of the multi-functional NPD process. For example, Cooper and Kleinschmidt (1987) found that product champions led firms that were successful in NPD. Indeed, Hart (2000) argued that firms often overlooked new products and new product concepts, particularly where such products or services had not yielded a return on investment. For example, Ramsay (1992) noted from his research that managers placed a greater priority on existing products rather than new products, particularly when they sought promotion or advancement within firms. Howley (2002) argued that it was this issue in particular which oriented a firm towards adopting a multi-disciplinary approach to NPD, where an innovation group shared collective responsibility for the management and development of new products. More importantly, the multi-disciplinary approach to NPD was considered to promote inter-departmental co-ordination and synergies between R&D and marketing functions within organisations.

In particular, Gupta and Wilemon (1990) believed that market and competitive uncertainties and inadequate customer needs assessment were responsible for the

failure of many NPD projects. As Cook (1998: 183) remarked: "*the most profitable new products will be those that meet the customer's needs more efficiently than competitors' products, and are therefore preferred by more customers*". In that context, Lynn and Reilly (2002) emphasised the need for a product to be based on genuine customer needs where firms would gather extensive information on both competitors and customers. In particular, they believed that gathering information from customers was vital to the NPD process. However, Wiig (1997) had previously argued that knowledge could only become an asset to a firm if it was enhanced, managed and effectively used. In that context, Martin *et al*. (1998) and Joyce (1993) stressed that the successful implementation of multi-functional teams and closer integration with the customer depended upon a strong knowledge management culture within firms.

According to Darroch and McNaughton (2002) and Nystrom (1985), a successful knowledge management culture promoted a synergistic approach to innovation whereby technical and marketing personnel approached innovation problems from diverse perspectives. Hurley and Hult (1998) and Li and Calantone (1998) agreed that knowledge management promoted a more flexible and efficient NPD process on which a competitive advantage could be built and sustained, and knowledge management was considered an important antecedent to innovation. In particular, Lynn *et al*. (1999) observed that organisations that utilised knowledge rapidly and effectively were able to innovative quickly and successfully. Furthermore, Lynn and Reilly (2002) found that NPD teams that were successful innovators also excelled at information exchange. Interestingly, Kohli and Jaworski (1990) and Narver and Slater (1990) argued that the key dimensions of knowledge management orientation, namely knowledge generation and knowledge dissemination, were also key dimensions of market orientation. Indeed, Khurana and Rosenthal (1998) and Moenaert *et al*. (1995) agreed that the adoption of a market-oriented culture facilitated more effective knowledge management within firms through increased levels of integration between functions within the NPD process. Overall, a central tenet of this market-oriented approach to innovation is the transfer, diffusion and implementation of information, and customer information especially, throughout the organisation, which is closely linked to a knowledge management orientation, and importantly, new product success.

3.5 Adopting an NPD Strategy

Traditionally, product development activities were looked upon as a strategic alternative within product portfolio techniques, which identified which markets to serve, and which products to serve these markets (Lord, 2000). However, successful product development activities encompass the complete management and organisation of the innovation process and not merely the development and design of new products. Specifically, Little (1984) believed that many corporate organisations lost competitiveness due to their short-sighted focus on mature products, and consequently, their failure to innovate and take advantage of emerging markets and customer trends. In terms of an improvement in organisational performance and competitiveness, Khurana and Rosenthal (1998) argued that organisations needed to place a stronger emphasis on the early or 'front-end' stages of the NPD process, and particularly, the formulation of an NPD strategy, which they considered an extremely important NPD success factor. Indeed, an NPD strategy is now widely considered a key driver of long-term portfolio management by organisations (Robinson and Jeongwen, 2002). Little (1984) and Kuezmarski and Silver (1982) succinctly described the NPD strategy as a portfolio of diverse strategic roles driven by the overall corporate objectives of an organisation. In effect, the NPD strategy defines the markets serviced, outlines the goals and objectives of NPD, and guides an organisation's policy on innovativeness and risk. The Department of Agriculture and Food (2003) specifically outlined eight key elements to the NPD strategy and these included: the corporate vision for the future of the firm; a statement of the role of NPD to the strategic growth of the firm; management expectations from NPD; the financial objectives of the NPD strategy; strategic focus in terms of markets targeted and projected market share; detailed market entry strategies; a statement of human resource requirements; and financial expenditure required to achieve the objectives of the NPD strategy.

Cooper and Kleinschmidt (1987), Cooper (1984a) and Kuezmarski and Silver (1982) emphasised the importance of a well-defined and focused product development strategy to successful NPD and business performance. At an organisational level, the NPD strategy promoted greater co-ordination of the NPD effort across functions, provided strategic direction for senior and middle management, and resulted in more effective and targeted resource allocation (Kuezmarski and Silver, 1982). At an

operational level, Kuezmarski and Silver (1982) maintained that the NPD strategy refined and focused the idea screening or generation stages of the NPD process, which subsequently led to a more efficient and less time consuming prototype development process. Indeed, Cooper and Kleinschmidt (1987) believed that the NPD strategy, when linked to the financial and strategic objectives of an organisation, provided focus for a firm's product development activities, and thereby established efficient selection criteria for potential new products or services. This, according to Cooper and Kleinschmidt (1987), was achieved through a stronger emphasis on the early stages of the NPD process, particularly in terms of concept screening and evaluation. Cooper (1984a) concurred that the NPD strategy was extremely important to the development of organisations and for product development success. Overall, Cooper (1984a) reiterated that the NPD strategy was a central element of corporate strategy and strategic thinking which provided coherence and direction for firms engaged in innovation. Indeed, Lord (2000) and Kuezmarski and Silver (1982) concluded that the most successful companies at NPD also used the NPD strategy that linked internal strengths to external opportunities and corporate objectives. However, Cooper (1984a) maintained that success in NPD depended upon the type of NPD strategy adopted by a firm.

3.5.1 Types of NPD Strategies

Robinson (2000) maintained that an important aspect of the NPD strategy concerned the strategic assessment of which products and markets would provide the basis for product development. Moreover, Robinson and Jeongwen (2002) claimed that product development strategies differed according to time of entry to market. For example, late entrants to the market were characterised by a low technological orientation and focused more on incremental developments such as line or brand extensions. On the other hand, Cooper (1984a) believed the choice of NPD strategy depended upon the type of performance desired by the firm. However, Foxall (1984) warned against the bulk of resources being allocated towards the most attractive markets. Specifically, Nystrom (1985) argued that success in innovation depended upon whether the strategy and structure of the company was compatible with the external environment, and Kiel (1984) noted that marketing and technological changes were the most important external environmental factors. Cooper (1984a) identified three main NPD strategies and these were: a closed NPD strategy; an open NPD strategy; and a balanced NPD

strategy. Generally, Terziovski (2002) remarked that firms, which sought customer satisfaction, favoured an open or incremental NPD strategy while firms driven by competitiveness adopted a closed or radical NPD strategy.

Cooper (1984a) defined a closed NPD strategy as a strategic orientation adopted by firms that primarily generated and utilised knowledge from internal resources. Cooper (1984a) characterised firms that adopted a closed NPD strategy in terms of: a strong R&D orientation; a proactive approach towards the acquisition of new technologies; and their use of new technologies in the development of innovative new products or services. Firms that adopted a closed NPD strategy were considered high impact performance organisations that leveraged internal technological orientation to focus their technical development efforts more effectively (Cooper, 1984a). The element of risk is a natural artefact when engaging in product development, although the level of risk associated with a closed NPD strategy is high. However, a number of researchers reported the benefits accrued from the adoption of a closed NPD strategy (Calantone *et al*., 2003; Hart, 2000; Bentley, 1990). For example, Bentley (1990) concluded that an organisation required a strategy that encouraged risk-taking and creativity in order to be successful in NPD. Hart (2000) also argued that the creation of an internal climate within organisations that accepted risk played a critical role in the NPD strategy. Furthermore, Calantone *et al*. (2003) found that risk taking and innovativeness were positively related to both NPD speed to the market and NPD strategic planning, and were positive antecedents to NPD performance. Overall, their research revealed that in turbulent markets, risk taking and innovation were most significant for NPD speed and strategic planning. Conversely, in less turbulent markets, open or balanced NPD strategies were most important for NPD speed and strategic planning. Indeed, Voss (1985) had earlier showed that organisations that encouraged risk-taking were more successful at NPD than firms that adopted a more cautious approach to the development of new products.

Nystrom (1985) stressed that the need for strategic change in innovation became more important as markets and customers changed. Nystrom (1985) concluded from a strategic review of past new product launches that open NPD strategies were more successful than closed NPD strategies. Cooper (1984a) defined an open NPD strategy as a strategic orientation adopted by firms that primarily generated and utilised

knowledge from external sources. Cooper (1984a) characterised firms that adopted an open NPD strategy in terms of: a strong customer and competitor orientation; a better understanding of customers and the markets in which they operated in; and a strong focus on incremental product development such as brand or line extensions. Firms that adopted an open NPD strategy were considered conservative performance organisations that leveraged their understanding of customers and competitors to differentiate their products, in order to build and sustain a competitive advantage (Cooper, 1984a). In particular, Ettlie and Subramaniam (2004) remarked that incremental innovations were the result of the refinement of existing knowledge, which reinforced prevailing markets, competitiveness, and strengthened barriers to entry by competitors. However, Takayama *et al*. (2002) and Cooper (1984a) also argued that firms that adopted an open NPD strategy needed to engage in significant technological innovations for long-term profitability, that is, a more balanced NPD strategy.

In terms of a strategic model for product and company development, Nystrom and Liljedahl (2002) argued for the adoption of an overall strategy that balanced radical or "*new-to-the-world*" and incremental innovations. Indeed, Robinson and Jeongwen (2002) found that market pioneers who were first to the market with new products needed to maintain a balanced marketing and technological NPD strategy. Cooper (1984a) defined a balanced NPD strategy as a strategic orientation adopted by firms that generated and utilised knowledge from both external sources and internal resources. Cooper's (1984b) investigation of the relationship between NPD strategy and business performance revealed that firms with a balanced portfolio, which were both technologically and market-oriented were also the highest organisational performers. Terziovski (2002) characterised firms that adopted a balanced NPD strategy in terms of: a mission statement that was communicated and supported; organisation-wide training and development; and where customers' requirements were disseminated throughout the organisation. Firms that adopted a balanced NPD strategy were considered high relative performance organisations that were market-oriented but were also technically aggressive (Cooper, 1984a).

National Provisioner (1995) also emphasised the need for greater linkages between technology and marketing, especially for synergies in the development of new

products targeted at specific usage occasions or specific market segments. As Robinson (2000: 32) noted: "the *development of a new product is the development of every aspect of the business that the product needs to be successful, and consistently successful products need every aspect of business working in harmony*". Indeed, Karlsson and Ahlstrom (1997) and Booz, Allen and Hamilton (1982) believed that a balanced NPD strategy created such a climate for further synergies between technical R&D and marketing personnel. Furthermore, Cooper (1984a) found that technological innovations, market synergy, and market orientation had positive effects on NPD performance. In that context, Corporate Board (1991) remarked that successful firms also had a strong culture around creativity and supported a multi-disciplinary approach to NPD. Overall Karlsson and Ahlstrom (1997) reiterated that NPD activities had to be multi-functional in nature, and a multi-disciplinary NPD process was also identified as a key NPD success factor.

3.6 Organising the NPD Function within Firms

Cooper and Kleinschmidt (1987) categorised NPD success factors as both controllable and uncontrollable. Not surprisingly, the strongest NPD success factors were considered controllable, of which organisation of the NPD function was one. The NPD literature strongly argues for a structured approach to innovation that encourages an inter-disciplinary approach to NPD (Cooper and Kleinschmidt, 1990). Tzokas *et al*. (2003) stated that in order to develop successful new products, organisations needed to align their new product strategy to the corporate strategy, and focus the NPD process towards the strategic direction of the firm. That is, the NPD process would be guided by the NPD strategy, which linked the NPD efforts with overall corporate objectives and goals. Cooper (1994b: 3) defined the NPD process as: "*a formal blueprint, roadmap, template or thought process for driving a new product project from the idea stage through to market launch and beyond*". According to Hart and Baker (1996) and Hnat (1994), tradition NPD models such as decision-stage, activity-stage, and decision-stage models were linear, and conceptualised NPD in terms of a number of functions engaged in a series of tasks that led to the development of a new product. Indeed, Bingham and Quigley (1989: 6) maintained that traditional processes were: "*sequential, with each stage following in a logical order*".

Haque and Pawar (2001) and Cooper (1994b) stated that traditional NPD processes were originally used as a measurement and control methodology, which ensured that a project proceeded to schedule and that all assigned tasks were completed. However, these linear models were associated with both long product development times and problematic issues that related to communication and collaboration between functions. In particular, Dougherty (1993) remarked that these models led to inadequate thought to product design, manufacturing and market-related issues, which had a negative effect on functional thinking, and departmentalised knowledge without dissemination. In fact, Hart and Baker (1996) and Cooper (1994b) argued that these linear sequential processes placed greater emphasis on product design and technical development and less emphasis on market expectations or marketing inputs. In particular, earlier models emphasised the importance of marketing towards the end of the NPD process only, in terms of market acceptance and feasibility, after products were developed (Meyer, 1984).

Furthermore, Marvin (2000) remarked that traditional approaches to management of the innovation function failed as a consequence of poor organisation of the NPD process. Specifically, Marvin (2000) argued that the failure of senior management to get involved in the early stages of the NPD process, poor communication of information throughout the functions involved in NPD, and the absence of a structured NPD process explained the high failure rates for new products. For example, Loch (2000) reported that two thirds of NPD projects in the information technology sector did not correspond to best practise approach. In particular, one third of projects did not have a formal NPD process and were approached in an informal 'under-the-table' fashion. Barclay (1992b) believed that the NPD process needed to be linked to the corporate objectives of the organisation and to the external environment for successful product development. Indeed, researchers such as Earle (1997), Larson and Gobeli (1988) and Cooper (1988) attributed the high failure rates for new product introductions in the food sector to the disparate NPD activities of technologists and marketers, and argued for greater linkages between marketing and technical R&D personnel.

Earle (1997) remarked that, traditionally, a wide gulf existed between R&D and marketing where scientists focused on pure research while marketers were only

concerned with market needs rather than technological possibilities. Earle (1997) argued that these two elements to the NPD process were equally important and stressed the need for an integrated approach to NPD. Indeed, Earle (1997) and Meyer (1984) had previously emphasised the increased importance of the business strategy at the 'front-end' of the NPD process, and Hnat (1994) described the importance of a multi-functional team where team members worked together on a common problem rather than resorting to functional hierarchies. Indeed, Eisenhardt and Behnam (1995) believed that multi-functional teams were essential to the development of successful new products. According to Gold (1987), the fundamental objective of a multi-functional team is closer integration to ensure the R&D function is sensitive to the emerging needs of existing and potential customers. In that sense, Anderson and West (1996) believed the use of multi-functional teams and teamwork increased the level of participation within organisations, which led to increased employee commitment, efforts, loyalty and creativity. In particular, multi-functional teams were believed to enhance a team's innovation systems and absorptive capacity for new ideas. For example, Kivimaki *et al*. (1997) remarked that multi-functional teams with clearly defined and shared objectives and vision were more likely to develop effective problem-solving skills as their efforts had focus and direction. Other tangible benefits accrued from multi-functional teamwork included: increased overlapping of activities; the early involvement of downstream functional disciplines; the pooling of knowledge; increased self-motivation, inter-departmental communication and co-ordination; and improved product quality (Haque and Pawar, 2001; Maylor, 1997).

3.6.1 Multi-disciplinary NPD Process Models

According to Natale *et al*. (1995) successful firms have shifted their values from traditional hierarchical management systems and structures to an emerging team management concept. In fact, recent NPD process models have stressed the importance of the introduction of the customer into the NPD process and the introduction of 'go or no-go' decisions between stages of the NPD process (Ramsley and Rogers, 1994). These important elements of the NPD process were believed to detect problems with concepts earlier; facilitated trade-offs based on technological and marketing requirements; and encouraged a multi-disciplinary approach to NPD (Hart and Baker, 1996). Bingham and Quigley (1989: 6) state that the multi-functional process "*consolidates communication between the technical, marketing and internal*

resource experts, resulting in a sharing of information, and an appreciation of the other perspectives, leading to more rapid decision making". More recent NPD process models have been characterised in terms of parallel activities by different functions with early involvement of all functions involved in the process that contribute to NPD. According to Crawford and di Benedetto (2003) and Cooper (1993), the stage-gate process is a conceptual and operational model for product moving from idea to launch. The process consists of a predetermined set of stages with each stage consisting of prescribed, multi-functional, and parallel activities. Uniquely, at each stage is a gate that serves as a quality control (QC) tool, 'go/kill' checkpoint or prioritisation decision point (See Figure 3.6.1.1).

According to Tzokas *et al*. (2003), the gates are designed to manage uncertainty, especially in terms of resource allocation, and identify areas where additional resources or focus is required. According to Cooper (1994b), more recent adaptations of the stage-gate process placed particular emphasis on more fluid and adaptable stages, which increased speed to market, as well as 'fuzzy' rather than absolute gates, which depended on the market situation. Cooper (1994b) stated that more recent adaptations of the stage-gate process also placed a greater emphasis on projects with high market potential, and provided for a more flexible process unique to each project vis-à-vis incremental or radical product developments (Cooper, 1994b). In effect, the stage-gate process places emphasis on pre-development activities, especially in the early stages of the NPD process. The process is multi-disciplinary where activities are undertaken concurrently rather than sequentially. More importantly, a strong market orientation is emphasised throughout the process but especially at the early stages of the process to ensure the process is customer-driven and market-focused. In effect, the customer becomes an integral part of the product development process (Cooper, 1994a). Hoopes (2001) believed that the integration of functions facilitated the effective co-ordination of the NPD process, and increased the extent to which each department understood the other's constraints. In effect, the multi-functional approach to NPD facilitated co-operation, co-ordination, and knowledge sharing. However, effective teamwork requires a culture or climate that facilitates efficient performance. Hellstrom *et al*. (2002) concluded that a key failure of NPD teams lay with a lack of facilitative learning and poor knowledge management. Indeed, Haque and Pawar

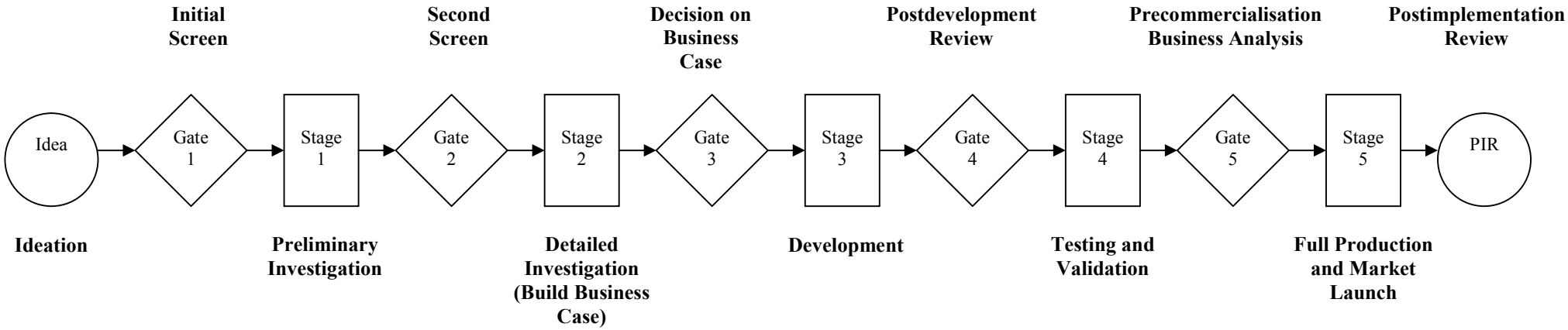


Figure 3.6.1.1 Cooper's Stage-gate New Product Process

Source: Adapted from Cooper (1993)

(2001) noted that management of human resources and knowledge were critical to successful multi-functional NPD teamwork.

3.7 Managing Knowledge and Knowledge Transfer within Firms

Organisations require information from both internal and external sources to evaluate and monitor business activities as well as make informed business decisions. Consequently, knowledge is widely considered one of the most important intangible resources that firms can possess, and is considered essential to the development of organisations (Grant, 1997). However, Wiig (1997) contended that knowledge could only become an asset to a firm if it was enhanced, managed and effectively used. More recently, Zahay *et al*. (2004) reiterated that the leveraging of both tacit and actionable knowledge required a knowledge management system that created, stored and disseminated not only information, but also know-how, experience and judgement within an organisation. Darroch and McNaughton (2002: 211) defined knowledge management as: "*the management function that creates or locates knowledge, manages the flow of knowledge within the organisation, and ensures that the knowledge is used effectively and efficiently for long-term benefit of the organisation*". Martin *et al*. (1998) stated that the overall aim of knowledge management was to enhance a firm's competitiveness through leveraging the potential value of knowledge. Carneiro (2000) also concurred with this view and reiterated that knowledge, and the successful management of knowledge, was a potential source of competitive advantage that could increase a firm's competitiveness.

Knowledge management, in terms of information dissemination, has traditionally been the domain of the IT function within firms through the development of information management support systems, such as data warehouses and data mining, which could facilitate information dissemination within organisations (Darroch and McNaughton, 2002). However, the growing importance of knowledge management to improved innovation has been voiced by numerous researchers (Carneiro, 2000; Dove, 1999; Grant, 1996; Nonaka and Takeuchi, 1995). Hurley and Hult (1998) and Li and Calantone (1998) believed that knowledge management promoted a more flexible and efficient multi-disciplinary NPD process on which a competitive advantage could be built and sustained. In particular, Carneiro (2000), Dove (1999) and Nonaka and Takeuchi (1995) considered knowledge management an important antecedent to

innovation. They argued that the development of successful knowledge management processes in firms led to higher levels of integration, and improved knowledge transfer between the various functions involved in the NPD process. Knowledge management and knowledge transfer were therefore considered key factors in NPD success (Lynn and Reilly, 2002). Indeed, a number of researchers (Sethi, 2000; Tang, 1999; Ittner and Larcker, 1997) observed positive relationships between knowledge management, inter-departmental co-ordination and innovation capability in firms. For example, Hoopes and Postrel (1999) in their study of functional integration in NPD within firms found that knowledge shared within an organisation constituted an important resource that stimulated innovation capabilities. Conversely, Zahay *et al*. (2004) attributed the failure of many NPD projects to the lack of appropriate information dissemination between functions within organisations. Song and Parry (1997) and Brooking (1996) also considered knowledge transfer within organisations an extremely important tool for the promotion of creativity, as well as an intellectual asset, which unlike tangible assists, increased in value with use.

In particular, Lynn *et al*. (1999) observed that organisations that utilised knowledge rapidly and effectively were able to innovative quickly and successfully. Furthermore, Lynn and Reilly (2002) found that NPD teams that were successful innovators also excelled in information exchange. Also, Coates *et al*. (1996) and Sowrey (1989) found a strong relationship between knowledge-based organisations, creativity in idea generation and new product success. In that context, Teece (1998) and Madhavan and Grover (1998) emphasised the importance of knowledge dissemination and responsiveness to knowledge within an organisation for the creation of a sustainable competitive advantage, and successful product development. Furthermore, Biemans and Harmsen (1995) stressed that formal reviews of past NPD projects was essential to create "*organisational memory*". Nonetheless, Joyce (1993) recounted the difficulties that firms experienced in both engendering and implementing knowledge management and knowledge transfer within organisations, which were primarily attributed to the cultural differences between technical R&D and marketing personnel. In particular, Carneiro (2000) believed that knowledge specialisation within technical functions resulted in knowledge remaining static within those specialised functional areas, and consequently, constrained overall knowledge diffusion within firms. However, Darroch and McNaughton (2002) gave differing insights into the importance of

information dissemination within firms to innovation capabilities. They argued that information dissemination did not directly influence innovation capabilities. Instead, they suggested that information dissemination provided indirect support to innovation when knowledge management became an organisation-wide philosophy.

Jang *et al*. (2002) remarked that firms required a knowledge management process that was both dynamic and flexible, which could respond to changes to a firm's innovation strategy. In particular, Cardinal (2001) and Dosi (1988) argued that the management style, and the importance of knowledge management and knowledge dissemination to innovation, depended upon the type of innovation pursued by a firm. For example, Song and Parry (1997) and Dewar and Dutton (1986) maintained that knowledge management and information dissemination were extremely important to technology-oriented NPD strategies due to the high level of risk associated with radical innovations. Consequently, Song and Parry (1997) and Dewar and Dutton (1986) stressed that firms needed to manage knowledge more effectively in order to stay close to the customer. Freeman and Soete (1997) suggested that a balance should be sought between technology-oriented and market-oriented NPD strategies. Specifically, Freeman and Soete (1997) and Cooper (1985) argued that firms which achieved this balance tended to be more successful or perform better in NPD than firms that chose either strategy. In particular, Curren *et al*. (1992) argued that successful management decisions required an understanding of customers' needs and preferences, as well as a competitor analysis.

Moingeon and Edmondson (1996) agreed that knowledge management created more evident values in a firm's offering in order to effectively meet customers' needs. To achieve this balance Kleinschmidt and Cooper (1995) and Kohli and Jaworski (1990) supported a market-oriented approach to innovation, as market-oriented firms were considered proficient at the generation and dissemination of information. Moreover, Kohli and Jaworski (1990) and Narver and Slater (1990) argued that the key dimensions of knowledge management orientation, namely knowledge generation and knowledge dissemination, were key dimensions of market orientation also. However, Brontis (2001) pointed out that knowledge management orientation was broader in scope than market orientation as it encompassed both marketing and non-marketing factors. In fact, while Darroch and McNaughton (2002) argued that knowledge

management orientation was in most respects analogous to market orientation, they also stated that market orientation became a subset of knowledge management orientation where the knowledge management process encompassed non-marketing information generated from other functions engaged in NPD within firms.

3.8 Summary

This chapter examined the management and organisation of the NPD function within firms. While numerous challenges to NPD were highlighted in this chapter, a number of critical issues that concerned best practice and contributed towards increased product success rates within firms were discussed. It was argued in this chapter that the adoption of a NPD strategy and the organisation of the innovation function were central to achieving success in product development. In particular, a clearly defined NPD strategy and a multi-functional product development process that was market-oriented were identified as extremely important NPD success factors. The adoption of market orientation in business, and in NPD, was also deemed a critical success factor to effectively managing knowledge and knowledge transfer within firms. In Chapter 4 the role of market orientation in innovation management is discussed.

Chapter 4: Market Orientation and New Product Development

4.1 Introduction

Chapter three reviewed the extant literature that pertained to the management and organisation of the innovation function within firms. In Chapter four the importance of market orientation to knowledge management and organisational performance is reviewed and discussed. The key internal factors that influence the degree of market orientation within firms, including the barriers to adopting a market orientation, are also highlighted in this chapter. Finally, the importance of a market-oriented approach to innovation in terms of both managing customer knowledge, and new product success is discussed.

4.2 Market Orientation Theory

The marketing concept is considered the foundation of modern marketing principles, and is widely acknowledged as a fundamental business philosophy, which places particular emphasis on satisfying customers' needs at a profit (McCarthy and Perreault, 1990). McNamara (1972: 51) defined the marketing concept as "*a philosophy of business management, based upon a company-wide acceptance of the need for customer orientation, profit orientation, and the recognition of the important role of marketing in communicating the needs of the market to all major corporate departments*". Therefore, an organisation that adopts a customer or market orientation seeks to understand the customer in order to deliver superior value to its customers (Kotler, 1988). Such an organisation is generally considered to possess a market orientation in business, and implies that the success of any firm depends above all on the customer (Carson and Gilmore, 1998). Narver and Slater (1990: 21) stated that "*market orientation is the organisation culture that most effectively and efficiently creates the necessary behaviours for the creation of superior value for buyers and thus, continuous superior performance for the business*". They argued that the market-oriented firm continuously looked for potential sources of sustainable competitive advantage, which created superior value from the customer's perspective.

In essence, Kotler (1988) maintained that a market-oriented firm built its organisational performance around the three key elements of the marketing concept: a

customer focus, co-ordinated marketing, and profitability. In that context, Kohli and Jaworski (1990) defined market orientation as "*specific activities that translate the marketing concept philosophy into practice*". Furthermore, Kohli and Jaworski (1990) conceptualised market orientation as both a philosophical or cultural ethos, and behavioural approach, to improved organisational performance. McCarthy and Perreault (1990) argued that market orientation denoted the implementation of the marketing concept and that market-oriented firms were organisations that embraced and implemented the marketing concept. Narver and Slater (1990) inferred from the literature that market orientation consisted of three behavioural components: a customer orientation; a competitor orientation; and inter-departmental co-ordination. They maintained that both customer and competitor orientations required the gathering and dissemination of knowledge on both customers and competitors throughout the organisation, while co-ordinated efforts between functional departments created superior customer value. Furthermore, Narver and Slater (1990) reiterated the importance of a competitor orientation and argued that firms needed to constantly seek superior value in relation to their competitors, in order to prevent a firm's competitive advantage being eroded over time. Consequently, Narver and Slater (1990) argued that market orientation consisted of two further decision criteria: a long-term focus, and profitability.

Shapiro (1988) specified three key characteristics that made a company market-driven: information on all important buying influences permeated every corporate function; strategic and tactical decisions were made inter-departmentally and inter-divisionally; and divisions and functions made well co-ordinated decisions, and executed them with a sense of commitment. Indeed, Shapiro (1988) reiterated that inter-departmental co-ordination and co-ordinated marketing were integral parts of the market orientation cultural philosophy, and were strongly liked to Cooper's (1994a) NPD success factors. However, Kohli and Jaworski (1990) emphasised that market orientation transcended both the marketing function and market research, and they emphasised the need to take action based upon market intelligence. Kohli and Jaworski (1990) argued that firms needed to adopt a market orientation rather than a marketing orientation since the former implied a broad focus on the market, avoided political overtones and emphasised inter-departmental co-ordination. In that context, Kohli *et al*. (1993) stated that market orientation was the organisation wide generation of knowledge that

pertained to customers needs, dissemination of intelligence across functions, and organisation-wide responsiveness to intelligence. Specifically, responsiveness referred to the ability of a firm to generate and disseminate information and knowledge, and was divided into two activities: response design, and response implementation (Jaworski and Kohli, 1993). Narver and Slater (1990: 22) noted that "*given the multi-dimensional nature of creating superior value for customers, marketing's interdependencies with other business functions must be systematically incorporated in a business's marketing strategy*". More so, Darroch and McNaughton (2002) emphasised that information generation and information dissemination were also key characteristics of knowledge management-oriented firms.

In summary, it is worth considering that Kohli and Jaworski (1990) and Narver and Slater (1990) approached market orientation from similar perspectives. Kohli and Jaworski (1990) and Narver and Slater (1990) acknowledged that a customer and competitor orientation, and inter-departmental co-ordination were central to market orientation. Both considered the nature of market orientation as a continuum, and most importantly, classified market orientation as an inter-related set of behavioural activities that a market-oriented firm engaged in (Harris and Piercy, 1999). Dobni *et al*. (2001) identified seven market-oriented factor groupings, measured on a continuum, that related to the design and implementation of organisational strategy and these referred to the degree of the following: formal intelligence generation; informal intelligence generation; intelligence dissemination; customer orientation; response design and implementation of orientation strategies based on intelligence; formal business planning and long-term profit orientation; and internal politics and technological advances.

4.3 Strategic Orientation and Organisational Performance

The marketing literature emphasises the need for firms to clearly understand customers, competitors and supply chain relationships in a manner that allows firms to systematically interpret, and respond to, circumstances in current and prospective markets. In particular, organisational management literature places particular emphasis on a firm's strategic orientation and its link to organisational performance. Manu and Sriram (1996: 79) succinctly defined strategic orientation in terms of "*how an organisation uses strategy to adapt or change aspects of its environment for a more*

favourable alignment". According to Narver and Slater (1990), a firm's strategic orientation reflected the strategic direction adopted by a firm, which created the necessary conditions for the continuous superior performance of the business. In terms of product development, the orientation strategy was also considered to have a significant impact on the characteristics of new products or services introduced to the market. Morgan and Strong (1998) outlined three types of strategic orientation, identified from a review of the NPD success factors, which a firm could adopt in NPD, and these were: a technological orientation; a competitive orientation; and a customer orientation. Furthermore, Henderson (1998) and Slater and Narver (1993) introduced an organisational culture typology in their analysis of orientation strategy behaviours, and these typologies were described as: a prospector or competitor orientation; an analyser or customer orientation; and a defender or technological orientation. These organisational typologies were considered to differ in terms of the degree of adaptation to their environment, the degree of market orientation, and dependence on particular managerial functions. In effect, Gatignon and Xuereb (1997) maintained that the strategic orientation that a firm adopted necessitated careful analysis and thought, and depended upon the types of products under consideration and the dynamics of the customer market.

Overall, the extant literature on strategic orientation argued that competitor and customer orientation strategies were prevalent among organisations that aimed to stay close to Narver and Slater's (1990) three behavioural components of market orientation. More so, Deshpandé *et al*. (1993) characterised market-oriented firms in terms of their ability to understand, anticipate and meet customers' present and future needs, through the development of new products and services. According to Dobni and Luffman (2000), market orientation is a culture that comprises a number of behavioural variables, and is a culture that manifests the strategic orientation of, and facilitates strategic implementation in, organisations. Specifically, Deshpandé and Webster (1989) argued that market orientation represented a set of beliefs or values, which put the customer, and knowledge generated about the customer, central to organisational thinking, strategy, and implementation of strategy. Morgan and Strong (1998) stressed that firms that did not recognise both the value of market orientation, and the management of market-related knowledge, would suffer in terms of a poor competitive strategy in the long-term. They argued that the form of organisational

strategy was more important than issues related to strategy implementation per se, and that market orientation had a central role to play in the development of an efficient strategic orientation and superior business performance.

Narver and Slater (1990) characterised competitor-oriented firms in terms of their ability to identify, analyse and respond to competitors. Slater and Narver (1993) stated that firms with a competitor orientation invested in flexible technologies, utilised product management and decentralised control, and proactively sought to identify and exploit new market opportunities through both product and market development. Indeed, Gatignon and Xuereb (1997) argued that competitor orientation strategies were most applicable to firms that operated in high growth markets and deemed it important to develop innovations at lower cost. On the other hand, Dobni *et al*. (2001) believed that firms that adopted a customer orientation strategy were closer to their customers, understood the environments in which they operated in better, and managed customer knowledge more effectively than their competitors. Henderson (1998) and Slater and Narver (1993) stated that customer-oriented firms invested in stable and flexible technologies and utilised matrix structures and complex co-ordinating mechanisms to explore new market and product opportunities, whilst core competencies in existing skills, products and markets were maintained. In essence, Slater and Narver (1996) concluded that market-oriented firms, which pursued either competitive or customer orientation strategies, characteristically adopted a strategy which was aggressively centred on customer-led product innovations, which focused on opportunities in individual market segments, and which were characterised by both low-cost and differentiated strategies.

In contrast, technology-oriented strategies occupy the lowest levels of the market orientation continuum. Staw and Cummings (1988) characterised technology-oriented firms in terms of: their strong R&D focus; their proactive search for acquiring new technologies; and their use of new technologies to develop innovative new products or services. Slater and Narver (1993) maintained that technology-oriented firms invested heavily in technological efficiency, and effectively managed the organisation with a functional structure and centralised control, in order to protect their markets. Furthermore, Morgan and Strong (1998) also reported that while strategic traits of proactiveness, analysis and futurity were positively associated with market orientation,

aggressiveness, defensives, and riskiness dimensions were associated more with a technological orientation. In that context, Gatignon and Xuereb (1997) maintained that the adoption of a technological orientation was necessary where firms wished to develop innovations superior to their competitors. This refers specifically to the pursuance of radical innovations that, by their very nature, are dissimilar to existing products or services, are highly differentiated, and therefore offer potentially superior competitive advantages in the marketplace (Atuahene-Gima, 1996).

However, given the high level of risk associated with a "*high impact*" NPD strategy, and technological orientation, it was not surprising when Slater and Narver (1993) and Cooper (1984a) concluded that market orientation strategies, both customer and competitor orientations, were significantly related to performance, while a technological orientation strategy moderated the link between market orientation and performance. As Dobni and Luffman (2000: 515) remarked: "*through identifying desired strategic behaviours that promote superior business performance, managers can attempt to create and maintain appropriate patterns of organisational behaviour in efforts to reduce the gap between desired and existing cultural patterns*". One such strategic orientation grouping, which has been positively linked to superior organisational performance, is market orientation.

4.4 The Link between Market Orientation and Organisational Performance

Denison (1990) maintained that organisational effectiveness and performance was a function of organisational values and cultural beliefs as well as organisational procedures, policies, processes and activities. The marketing concept succinctly states that business success depends upon satisfying customers' needs better than competitors. Furthermore, Narver and Slater (1990) maintained that market orientation was an organisation-wide culture that fundamentally established organisational behaviours in respect of an organisation's interaction with its customers and competitors. In that context, researchers such as Slater and Narver (1994) and Jaworski and Kohli (1993) argued that the adoption of market orientation was a prerequisite for firms that wished to create products that met customer needs superior to their competitors. More so, Hunt and Morgan (1996) stated that market-oriented firms were more likely to gain a sustainable competitive advantage and superior long-term financial performance. There is considerable evidence to suggest that, depending

upon environmental conditions and firm factors, some form of association exists between a market-oriented culture and organisational performance (Pitt *et al*., 1996; Selnes *et al*., 1996; Jaworski and Kohli, 1993; Ruekert, 1992; Narver and Slater, 1990). Consequently, researchers such as Kohli *et al*. (1993), Narver and Slater (1990) and Kohli and Jaworski (1990) argued that the adoption and implementation of market orientation led to higher levels of organisational performance and business success. Therefore, Fritz (1996) maintained that market orientation's impact on organisational performance and success needed to be judged in terms of its ability to meet the four key objectives of corporate success: competitiveness; customer satisfaction; new product success; and long-term profitability.

Narver and Slater (1999) found that organisations with high levels of market orientation also had the highest Return on Assets (ROA) and the difference in ROA between high and low market-oriented firms was significant. Furthermore, Narver *et al*. (1999) also found that market orientation was positively associated with improved sales levels. However, Gray *et al*. (1998) found that the relationship between market orientation and performance was strongest with customer satisfaction and weakest with profitability, which suggested that market orientation was a stronger predictor of superior customer orientation than superior financial performance. Instead, inter-departmental co-ordination, an integral element of Narver and Slater's (1990) conceptualisation of market orientation, exhibited the strongest positive relationship with Return on Investment (ROI). Consequently, Gray *et al*. (1998) argued that knowledge management, in terms of information dissemination and inter-departmental co-coordination, was strongly linked with improved business efficiency and profitability. Even though a lack of consensus exists concerning a direct link between the adoption of market orientation and elements of successful financial performance, such as ROI and profit levels, elements of market orientation such as inter-departmental co-ordination and a customer orientation appear to form intermediate constructs that connect market orientation and performance (Guo, 2002).

Kleinschmidt and Cooper (1995) and Kohli and Jaworski (1990) argued that market orientation was positively linked to successful knowledge management in NPD, as market-oriented firms were considered proficient at gathering and disseminating information. For example, Perry and Shao (2002) and Dobni *et al*. (2001) more

recently observed that high levels of formal intelligence generation, response design and implementation, and a customer orientation were significantly related to business performance in highly competitive markets. Furthermore, Leisen *et al*. (2002) argued that intelligence generation and response design and implementation were extremely important to organisational performance in markets where the levels of innovation and new product introductions were high. Indeed, Fritz's (1996) examination of the influence of market orientation on organisational success demonstrated that market orientation particularly benefited organisational performance and success where the following organisational conditions existed: inter-departmental co-ordination; high management control; delegation of responsibility throughout the managerial hierarchy chain; and a high cost of market entry for competitors. More importantly, Fritz (1996) found that market orientation was positively correlated with organisational success in conjunction with cost efficiencies and an employee orientation, and similar findings have been reported elsewhere (Jaworski and Kohli, 1993). In terms of product and market development, Dobni *et al*. (2001) found that high levels of market orientation were positively associated with product newness, efficient market segmentation and customer orientation, knowledge management and overall business performance. In effect, Atuahene-Gima (1996) found that market orientation had a positive relationship with market success. These findings suggested that the influence of market orientation transcended specific innovations and impacted on the performance of other products. Consequently, market orientation delivered cost efficiencies for the firm and enhanced profitability and customer use of other products produced by the firm (Atuahene-Gima, 1996).

Although the market orientation literature emphasised the positive link between market orientation and organisational performance, Kohli and Jaworski (1990) and Narver and Slater (1990) remarked that the adoption of a market orientation was both complex and costly, and depended upon the degree of market orientation that a firm desired. In particular, Deshpandé (1999) and Narver and Slater (1990) found through a correlation analysis of market orientation against financial performance that market orientation's relationship with business performance was U-shaped, rather than linear. In conclusion, while numerous researchers such as Jaworski and Kohli (1993), Ruekert (1992) and Narver and Slater (1990) stressed the importance of market orientation to organisational strategy, performance and success, Fritz (1996) remarked

that these studies underestimated the organisational difficulties in the adoption and implementation of market orientation.

4.5 The Barriers to the Adoption of a Market Orientation

The extant literature on market orientation has identified which organisational activities can lead to higher levels of market orientation in firms (Narver and Slater, 1990; Kohli and Jaworski, 1990). Furthermore, researchers such as Slater and Narver (1994), Jaworski and Kohli (1993) and Ruekert (1992) have found positive relationships between organisational strategy, organisational performance, and market orientation. However, a growing body of literature has also found that business managers have encountered numerous barriers to developing and sustaining a market orientation within their respective firms. Harris and Piercy (1997) remarked that organisations lacked genuine and effective implementation of market orientation. Traditionally, this had been attributed to a lack of understanding of market orientation by firms, as well as an inability to move from market-oriented "*aspirations to practical management action to realise those aspirations*" (Harris and Piercy, 1997: 33).

For example, Kohli and Jaworski (1990) argued that poor knowledge management practices, in terms of weak information systems and organisational unresponsiveness to information generated, where primarily attributed to low levels of market orientation in firms. Narver and Slater (1990) argued that since market orientation was primarily a philosophical ethos or culture, then the attitudes and behaviour of employees were primarily responsible for low levels of market orientation in organisations. Generally, the barriers to the adoption of market orientation have been categorised in terms of both cultural and specific market-related behaviours (Meehan, 1996), systems and processes (Ruekert, 1992), and interactions between functional departments and the characteristics of organisational systems and structures (Harris, 1996; Jaworski and Kohli, 1993) (See Figure 4.5.1). For example, human resource-related issues have been presented as a major barrier to the adoption of market orientation within firms. These included: inexperience of executives; incomplete integration of functions; lack of management ability; and certain power-related problems (Harris and Piercy, 1999). According to Harris (2000; 1998a), senior managers believed the implementation of market orientation in firms was impeded as

a consequence of low levels of motivation and satisfaction among employees, and the lack of reward perceived by employees from the implementation of market orientation. Indeed, Baker (2002), Jaworski and Kohli (1993) and Ruekert (1992) concluded that the level of market orientation in firms was influenced by the provision of reward systems, the development of new skills, and the elimination of restrictive career paths. In addition, power-related issues associated with organisational hierarchy and compartmentalisation of tasks within organisations also influenced the level of market orientation in firms. For example, Harris and Piercy (1999) found a negative association between internal issues of organisational politics and market orientation.

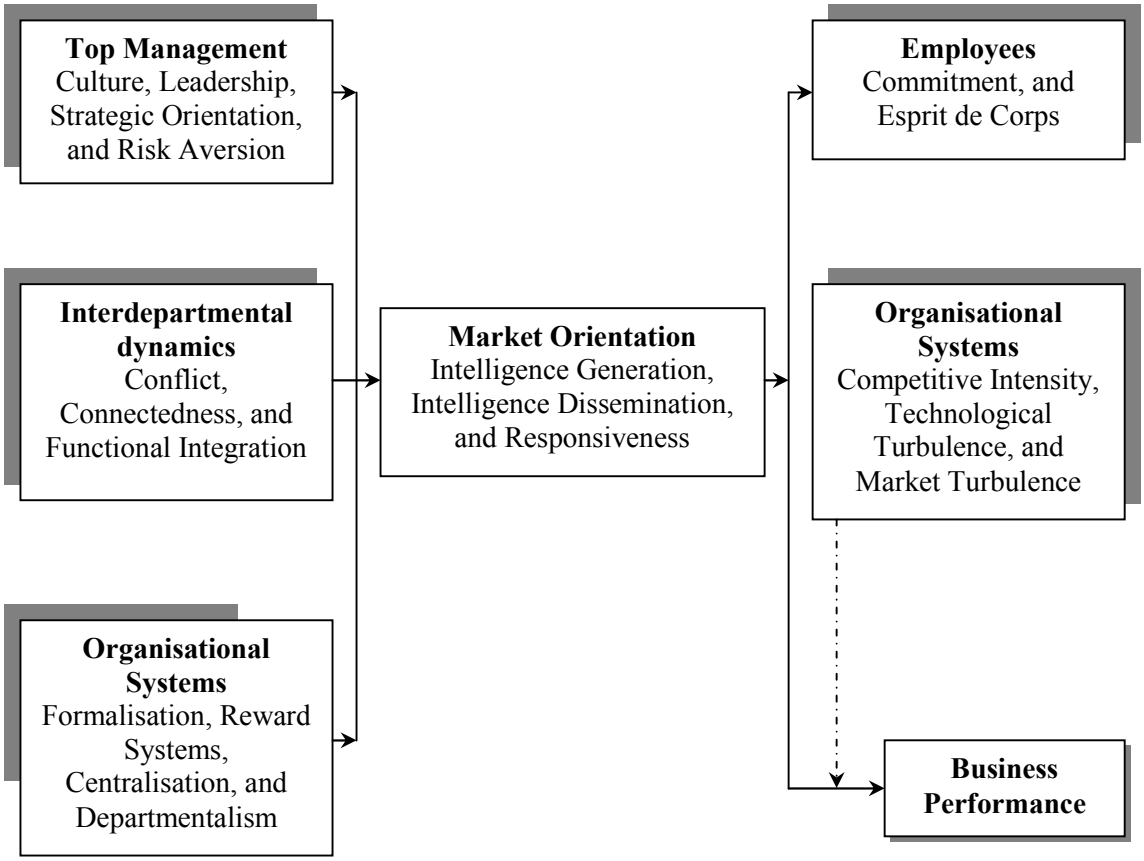


Figure 4.5.1 Market Orientation: Antecedents and Consequences

Source: Adapted from Harris (1996)

Jaworski and Kohli (1993) in their study on organisational barriers to market orientation found that the emphasis that senior management placed on market orientation influenced the three central components of market orientation: intelligence

generation; information dissemination; and responsiveness. Ruekert (1992: 225) found that the extent of market orientation within a firm was linked to "*the organisational structures, systems, and process created to sustain them*". Indeed, Lichtenthal and Wilson (1992) suggested that the achievement of high levels of market orientation was impeded by the lack of appropriate role relationships. They also suggested that structural distance influenced the potential for, and speed of, market-oriented change to the extent that structurally distinct functions within a firm went unaffected by efforts to change. Additionally, Day (1994) argued that a lack of market sensing and customer linking proved further barriers to the development of market orientation by firms. Other internal organisational barriers to market orientation that were mentioned by Wong *et al*. (1989) included departmental preoccupation with functional problems, the lack of appropriate skills, unclear marketing objectives, and financial resource limitations. In particular, Harris and Piercy (1997) reported that firms recounted financial resource limitations, such as management time, training and development, market information and planning and recruitment most frequently, which explained low levels of market orientation in firms. Moreover, culture-related behaviours have also been mentioned as factors that impede the adoption of market orientation in business.

Culture-related behaviours have also been cited by researchers as important ascendants to the adoption of market orientation in business. Wong *et al*. (1989) reported that a major barrier to market orientation faced by organisations related to the "*difficulty in attempting to change traditional thinking and practices within firms*". In particular, Robertson (1995) and Chaganti and Sambharya (1987) argued that the orientation of organisations was influenced by the commitment and abilities of senior management. At the organisational level, this referred specifically to the corporate culture that prevailed within an organisation, and Messikomer (1987) concluded that corporate culture presented a major barrier to market orientation. In addition, Hatch (1993) found that the elements of culture that acted as barriers to the implementation of market orientation in firms included: basic assumptions; shared values; organisational artefacts; and symbolic influences. As Slater and Narver (1995: 63) noted: "*the critical challenge for any business is to create the combination of culture and climate that maximises organisational learning on how to create superior customer value, because*

the ability to learn faster than competitors may be the only source of sustainable competitive advantage".

4.6 Corporate Culture and the Adoption of Market Orientation

Corporate culture-related issues have been identified as important antecedents to the adoption and implementation of market orientation in business. Kilman *et al*. (1985) perceived corporate culture as a body of solutions to problems that worked consistently, and were therefore taught to new personnel as the correct way to perceive, think about, and act in relation to those problems. In that context, Kilman *et al*. (1985) conceptualised organisational culture as the ethos that bound managers together for effective implementation of organisational strategies. Hofstede (1991: 180) defined corporate culture as "*the collective programming of the mind which distinguishes the members of one organisation from another*". In particular, Hofstede (1991) believed that corporate specific norms and values were reflected in the organisation's activities, which included the marketing function. More importantly, Parasuraman *et al*. (1994) maintained that an organisation's collective culture, through its impact on implantation, affected the marketing effectiveness of a company, and a number of studies found a significant relationship between organisation culture and market orientation (Day, 1994; Deshpandé and Webster, 1989).

Market orientation constitutes a form of organisational culture and is thus highly linked to the cultural characteristics of an organisation (Day, 1994; Slater and Narver, 1994). Market orientation can be defined in terms of two distinct yet equally important characteristics. First, market orientation is a belief or value that forms an integral part of a company's culture, and second, consists of the processes and activities that lead to the implementation of the marketing concept (Deshpandé and Webster, 1989). Deshpandé and Webster (1989: 4) remarked that organisational culture was "*a pattern of shared values and beliefs that provided individuals with norms for behaviour within an organisation*". According to Narver and Slater (1990), market orientation is the culture that initiates behaviours within a firm, which delivers superior value to customers. In that context, Harris (1998b: 360) succinctly defined a market-oriented culture as "*the dominant, dynamic segment of an organisation whose orientation, attitudes and actions were geared towards the market*". Deshpandé and Webster (1989) first argued that a market-oriented culture was an important tool, which could

be used by a firm to implement strategy and direct an organisation more effectively. Deshpandé and Webster (1989) further stated that market-oriented firms placed particular emphasis on learning, human resource development and participative decision-making as being key components of supportive cultures within organisations.

Lafferty and Hult (2001) maintained that cultural focus went beyond the structures and activities, both formal and informal within an organisation, and related to the fundamental values that determined the practices and behaviours within an organisation. Kasper (2002) and Day (1999) believed that market-oriented firms possessed an externally-oriented culture, which was open and participative, and led to the foundation of a "*learning organisation*". This was congruent with Hofstede's (1991) characterisation of the market-oriented firm as one that was open-minded, and accepted and facilitated both existing and new employees in an organisation. Hofstede (1991) went further and stated that a market-oriented organisation: prioritised customer needs; was pragmatic in its culture; was result-oriented; competitor-oriented; and accepted risk. Furthermore, Baker and Sinkula (1999) argued that market orientation was a fundamental cultural focus which preceded managerial focus, and therefore, predetermined performance. As Day (1999: 54) noted: "*a market-oriented culture emphasises competitiveness and goal achievements as well as productivity and market mechanisms*".

4.6.1 Market-oriented Culture and New Product Performance

Slater and Narver (1995) and Day (1994) argued that a market-oriented culture was the primary basis for the generation and dissemination of market intelligence to gain a competitive advantage and enhance performance. They argued that market orientation manifested at both operational and culture levels and that market orientation, when embedded in the culture of an organisation, led to improved market vigilance and action. In essence, market orientation is widely considered one of the most important resources that give a firm competitive advantage (Hunt, 2001; Hunt and Morgan, 1996). Day (1994) remarked that the internal capabilities of a market-oriented organisation, in terms of strategic thinking, market confidence and performance, were clearly linked to the underlying values or culture of the organisation. In particular, market capabilities and performance were considered to stem from the openness of an organisation's culture. Narver and Slater (1990) investigated the effect of a market-

oriented culture on business performance. They concluded that a market-oriented culture produced market-oriented behaviours in business that in turn led to greater organisational performance. In that context, Slater and Narver (1994) argued that firms needed to develop high levels of market orientation so as to deal with ever-changing market conditions and customers, for a superior competitive advantage in the marketplace. In effect, Gainer and Padanyi (2005) and Deshpandé *et al*. (1993) found that the positive relationship between market-oriented activities and performance was mediated by a market-oriented culture.

Overall, Deshpandé and Farley (2004; 1999) found that open strategies such as market and competitor orientations were associated with better organisational performance, while a technological orientation was characterised by poorer performance. However, Deshpandé (1999) and Cameron and Quinn (1999) argued that the different types of organisational cultures were not mutually exclusive and that multiple cultures co-existed in firms, although one type of culture clearly dominated an organisation's activities and processes. This was considered especially true where firms pursued different internal objectives and structural arrangements (Deshpandé *et al*., 1993). Deshpandé (1999) and Howard *et al*. (1998) maintained it was therefore necessary for firms to achieve a balance in both the corporate culture and NPD strategy, in order to realise efficiencies and effectiveness in organisational performance. So while the market orientation literature emphasised the importance of corporate culture, and specifically a market-oriented culture, to organisational performance, other researchers such as Robertson (1995) and Chaganti and Sambharya (1987) highlighted the influence of the leadership abilities of senior management on the strategic cultural orientation of organisations.

Bass and Avolio (1993) and Nicholls (1988) recounted the strong links between corporate culture and leadership styles. The role of senior management has emerged as a prerequisite to fostering an internal customer focus and market orientation (Harris and Piercy, 1999; Jaworski and Kohli, 1993; Webster, 1988). Deshpandé *et al*. (1993) argued that the adoption of market orientation was facilitated by the importance which senior management placed on the understanding of customer and market developments. Indeed, Lukas and Maignan (1996) believed that greater senior management support for an internal customer orientation led to higher levels of market

orientation throughout an organisation. Therefore, an important antecedent to adopting a market-oriented culture in business concerns senior management's ability to communicate their beliefs, values and vision for the future to all employees within an organisation (Jaworski and Kohli, 1993). Harris and Ogbonna (2001) explored the impact of top management leadership style on the process of market orientation development. They found that participative and supportive leadership styles were positively associated with overall market orientation and its constituent components were: a customer orientation; a competitor orientation; and inter-departmental co-ordination (Harris and Ogbonna, 2001). Furthermore, Lancaster and van der Velden (2004) found that market-oriented leaderships, which encouraged risk-taking as a key element of innovation, resulted in higher employee commitment to the development of new products and services. Although the role of senior management in engendering a market orientation in organisations has been voiced by many researchers (Harris and Ogbonna, 2001; Deshpandé *et al*., 1993; Jaworski and Kohli, 1993), two factors related to inter-departmental dynamics, namely inter-departmental connectedness and conflict have been identified as important determinants of levels of market orientation in organisations.

4.6.2 The Influence of Market Orientation on Inter-departmental Dynamics

Market orientation is believed to play an extremely important role in the development of a firm's corporate culture and product development strategy. Dobni *et al*. (2001) maintained that organisations had all too often failed to recognise the contributions that employees could make to the implementation of a firm's strategy. In particular, they argued that many firms failed to provide a context or culture for employee behaviour and the resultant underutilisation of employee potential to enhance organisational performance. In market-oriented firms personnel are aware of the organisation-wide commitment to satisfying customer needs. While numerous studies have been conducted into the effect of market orientation on organisational performance, there has been a growing awareness of the positive effect of a market-oriented culture within firms on employee development and performance. In particular, there has been increasing evidence of a positive link between market-oriented culture and employee attitudes and behaviours (Harris and Ogbonna, 2001). A number of studies that investigated the factors that contributed towards the development of a market-oriented culture in firms suggested that employees were the

crucial link or interface between the organisation and the market (Harris and Piercy, 1998; Messikomer, 1987).

Market orientation has been shown to foster a culture of employees' organisational commitment (Jaworski and Kohli, 1993). Ruekert (1992) proposed that market orientation was linked to employee career satisfaction, trust in other employees across functions, and organisational commitment. Consequently, Ruekert (1992) concluded that levels of employee satisfaction, trust and commitment impacted on broader organisational performance. Furthermore, Schneider and Bowen (1993) stated that employees that perceived their organisation to be intensely market-oriented found that customers also reported higher levels of satisfaction. These findings supported the work of Jaworski and Kohli (1993) where market orientation was positively associated with organisational commitment and esprit de corps. Jaworski and Kohli (1993: 64) concluded, "*it appears that a market orientation nurtures a bonding between employees and the organisation, as well as promotes a feeling of belonging to one big organisational family dedicated to meeting and exceeding market needs*". Selnes *et al*. (1996) also found similar linkages between market orientation and commitment and esprit de corps, and Conduit and Mavondo (2001) agreed that a market-oriented culture provided a unifying focus to an organisation's strategy, and facilitated inter-departmental relationships. In that context, Gummesson (1991: 60) maintained that a market-oriented culture "*only became alive when all members of an organisation became involved*". Gummesson (1991) argued that the development of a market-oriented culture often failed due to an over-emphasis on the understanding of the customer that focused on the marketing function, rather than the promotion of a market orientation, which emphasised the organisation-wide acceptance of the marketing concept. This is congruent with Kohli and Jaworski's (1990) view that inter-departmental co-ordination is a strong determinant of levels of market orientation and knowledge management in firms, and ultimately, new product success.

4.7 The Influence of Market Orientation on Innovation

The study of innovation has encompassed a myriad of research efforts covering such diverse topics as: the impact of managerial leadership on innovation; issues concerning organisational size and structure; resources issues; levels and types of innovation across industries and sectors; as well as issues related to functional

differentiation, culture and organisational politics (Clegg, 1999; Lindkvist *et al*., 1998). However, empirical research investigating the organisational context that aids or presents barriers to innovation has become central to our understanding of organisations and innovation. Drazin and Schoonhoven (1996: 1066) noted that "*innovation theory has traditionally been dominated by normative explanations of how to achieve an outcome seen as central to the interests of managers: increasing the number of successful innovations generated*". However, Manu and Sriram (1996) and Calantone *et al*. (1996) suggested that high rates of new product introductions were not associated with successful product or service innovation. In that context, an increasingly important domain of research in recent times concerns the positive relationship between market orientation and new product success (Dobni *et al*., 2001; Atuahene-Gima, 1996). Biemans and Harmsen (1995: 22) define market-oriented NPD as "*the collection, dissemination and responsiveness to relevant market information*", which is linked to new product success.

Slater and Narver (1994) and Narver and Slater (1990) stressed that market orientation exerted a positive effect on new product success. In particular, market orientation is considered to exert a significant positive influence on the organisation and process of NPD. For example, Slater and Narver (1995) proposed that NPD activities and outcomes drove the relationship between market orientation and organisational performance. Specifically, Atuahene-Gima (1995) demonstrated that market orientation positively influenced a firm's proficiency in three key NPD activities linked to organisational performance: pre-development activities; inter-departmental teamwork; and new product launch activities. Atuahene-Gima (1996) demonstrated that inter-departmental teamwork in particular mediated the relationship between market orientation and NPD performance. This suggested that market orientation provided a unifying focus for the proficiency in NPD activities within the organisation, which led to superior NPD performance. Han *et al*. (1998) also found that market orientation facilitated both radical and incremental innovations, which, in turn, improved organisational performance.

Market orientation theory stresses the importance of market intelligence generation on customers and competitors, and dissemination of information within firms. It therefore follows that market-oriented firms, which promote inter-departmental co-ordination,

would be expected to have a better understanding of customers' needs, manage knowledge more effectively and efficiently, develop superior new products and services to meet their needs, and therefore, positively affect the degree of innovation in firms (Lado and Maydeu-Olivares, 2001). Other researchers such as Ottum and Moore (1997) and Cooper (1994a) concluded from their empirical research that the adoption of market orientation was associated with reduced product failure rates. Overall, numerous researchers have reported on market orientation's positive influence on the degree of innovation in business (Lado and Maydeu-Olivares, 2001; Slater and Narver, 1995; Cooper and Kleinschmidt, 1987). For example, Lado and Maydeu-Olivares (2001) found a statistically significant relationship between market orientation and business innovation. Furthermore, Cooper *et al*. (2001), in their study on new product launches in the financial services industry, also found that a market-oriented NPD process distinguished between successful and unsuccessful firms engaged in innovation. In effect, Atuahene-Gima (1996: 94) stated that market orientation created "*a setting conducive for effective and efficient organisational activities leading to superior performance*". However, other researchers such as Atuahene-Gima (1996) and Hayes and Abernathy (1980) argued that market orientation exerted a negative influence on NPD.

For example, Bennett and Cooper (1981) argued that market orientation exerted a negative influence on innovation, as they believed it led to the development of imitative or incremental innovations rather than radical innovations. Hayes and Abernathy (1980) also asserted that market-oriented NPD strategies stifled radical innovations as a consequence of customers' inability to articulate future needs beyond their present purchase behaviour. Indeed, Atuahene-Gima (1996) found that market orientation had a significant negative influence on product newness, and similar to Bennett and Cooper (1981), argued that market-oriented firms were less likely to develop innovative products. On the other hand, Slater and Narver (1995) maintained that innovation was one of the core "*value-creating capabilities*" that drove market-oriented organisations. They argued that market-oriented organisations through their inherent customer and competitor orientation were in an ideal position to respond to customers needs through the addition of innovative new products or services. Cooper (1994b) concurred with this view where market orientation was found to be of most benefit to firms that developed incremental products at the early stages of the product

lifecycle in highly competitive markets. Accordingly, this market orientation gave firms a distinct competitive advantage in terms of speed to the market with new product offerings, and effectiveness in response to changing market dynamics, threats and opportunities (Slater and Narver, 1995). Indeed, Cooper (1994a) and Cooper and Kleinschmidt (1987) argued that market orientation led to the speedy adoption of new products, and innovation success generally, as they believed market orientation reduced the degree of incompatibility of new products. Furthermore, Calantone and di Benedetto (1988) and Cooper and Kleinschmidt (1987) argued that market-oriented firms, through their understanding of customers' needs, were more likely to develop new products that matched their current market and technological resources and skills. However, Darroch and McNaughton (2002) stated that knowledge management-oriented firms, characterised by balanced NPD strategies, performed better at NPD than solely market-oriented firms as the former were more likely to remain competitive as a consequence of their internal technological capabilities, if a competitor introduced a radical innovation to the marketplace.

4.8 Customer Integration for Market-oriented Product Development

Product development, and the success of new products, has emerged as one of the most critical strategic concerns of firms. Kim and Wilemon (2002) stated that most activities in the NPD process were conducted in a probabilistic setting. They maintained that uncertainty was characteristic of the early stages of the NPD process in terms of identifying concepts that would be most promising, and whether new concepts would gain customer acceptance. Slater and Narver (1996) and Moorman (1995) argued that a market-oriented culture reduced many of the risks associated with the process of developing new and innovative products. Cooper (1993) argued that market-oriented organisations were committed to satisfying customers' needs, and to achieve this, fostered direct customer contact, generated knowledge from customers about their needs, and used this information to design new products and services. As Calantone *et al*. (1996: 341) noted: "*it is important to collect and assess market and competitive information in order to understand customers' needs, wants and specifications for a product in order to understand customers' purchase decisions, and to learn about competitors' strategies*". Therefore, market-oriented organisations continuously monitor their external environments for both NPD opportunities and threats from competitors. By focusing on customers' latent needs, market-oriented

firms are well positioned to recognise emerging needs and rapidly assess customers' responses to new products (von Hippel, 1986). Indeed, through their market-scanning efforts, market-oriented firms are able to discover underdeveloped market niches and segments, and are also capable of identifying opportunities created by competitors' miscues (Slater and Narver 1996).

In particular, Cooper (1993) argued that the barriers to new product success related to customer intelligence processes as much as any other part of NPD process. This led Moorman (1995) and Day (1994) to suggest that NPD activities and outcomes were highly influenced by a firm's intelligence generation systems and processes. Khurana and Rosenthal (1997), Cooper (1993) and Cooper and Kleinschmidt (1988) maintained that organisations failed to implement and manage formal intelligence generation processes and neglected critical stages of the NPD process. In particular, Smith and Reinertsen (1992) argued that firms ignored the early stages of the product development process. The early stages of the NPD process is the period when opportunities are first considered and move through the stage-gate process for further development. Cooper (1993) stressed the importance of proficiency in the early stages of the NPD process and argued against avoiding front-end activities. More so, Khurana and Rosenthal (1998) claimed that front-end activities were inter-related, and that an oversight in relation to front-end activities led to product failure. According to Cooper (1988), firms that surpassed competitors in the identification of viable new product concept were those firms that focused on up-front NPD activities. Brown and Eisenhardt (1997) and Cooper and Kleinschmidt (1987) also stressed that companies needed to gain a greater understanding of the 'voice of the customer' in order to develop successful new products. Although market intelligence can be generated throughout the NPD process, researchers such as Bogue (2001), Urban and Hauser (1993) and Cooper (1988) argued for the integration of 'voice of the customer' information particularly at the early stages of the NPD process, where customers' unmet needs and wants could be identified.

4.8.1 Management of Customer Knowledge in Product Development

Wikstrom (1996) believed that the incorporation of customers' value-creation into the early stages of the NPD process made organisations better able to adapt to changes in customers' needs, and ultimately led to higher quality and customer satisfaction.

Furthermore, Cooper (1988) argued that this led to the creation of a deeper relationship with the customer and created more effective and efficient opportunities for acquiring knowledge. Hart (1996) argued that the customer had an extremely important role to play at the input or early stages of the NPD process in two respects: the customer as a resource, and the customer as co-designer in NPD. According to Wikstrom (1996), the early stages of the NPD process present an opportunity to create value with, rather than for, the customer. More importantly, in market-oriented organisations, customers are viewed as important co-designers in the NPD process since they can make an effective contribution to product design and acceptability (Cooper, 1993). Seeing as customers are the final stakeholders and arbiters of new products, involving customers in the early stages of the NPD process can reduce uncertainty in product development. Cooper (1993) suggested that the integration of the customer with the NPD process could best be achieved at the pre-development stages of ideation, concept definition and concept screening and optimisation. However, Simonson (1993) concluded that customer preferences were often fuzzy and imprecise, and consequently, were susceptible to a wide variety of seemingly irrelevant influences. More so, Simonson (1993) stated that customers often found it difficult to articulate their unmet needs to product development personnel. Not withstanding this, van Kleef *et al*. (2005a) argued that, although customers' needs and preferences were sometimes difficult to determine, it was important to understand how customers perceived products and made purchase decisions. In the context of knowledge management, Zhang and Doll (2001) stated that it was not sufficient to solely engage the customer and generate information on customer needs, the information had to be disseminated to team members and incorporated into the decision-making processes on product design.

The NPD literature strongly argues for a structured approach to innovation that encourages an inter-disciplinary approach to NPD (Cooper and Kleinschmidt, 1990). Although firms have recounted difficulties in engendering and implementing multi-functional teamwork, Slater and Narver (1995) and Kohli and Jaworski (1990) emphasised the important role of a market-oriented culture in the development of efficient and effective organisational structures and behaviours. In particular, Narver and Slater (1990) maintained that inter-departmental co-ordination was an influential aspect of an organisation's NPD structure and process that also maximised the benefits

from an efficient strategic orientation. In that context, Day (1994) argued that market-oriented firms were more likely to exploit emerging market opportunities than product-oriented firms as their organisational structure, processes and behaviour facilitated efficient and effective responsiveness to market information and knowledge. Furthermore, Day (1994) believed the problem solving capability of market-oriented firms was enhanced through the integration of NPD activities, including intelligence dissemination, across functions, which led to superior value for customers through the development of new innovative products. Not surprisingly, in light of the multi-functional nature of the NPD process, researchers such as Cooper (1999) and Griffin and Page (1996) argued that proficiency in inter-departmental co-ordination and teamwork, and knowledge management, mediated the relationship between market orientation and NPD performance. This concurred with the findings of Atuahene-Gima (1996), Craig and Hart (1992) and Griffin and Hauser (1992) that those important characteristics of a market-oriented and knowledge management-oriented organisation, such as intelligence generation, dissemination and inter-departmental co-ordination, were success factors in NPD, and positively linked to improved NPD performance. Jaworski and Kohli (1993) and Kohli and Jaworski (1990) considered market orientation extremely beneficial in terms of reduced time to market due to competitive pressures. They believed that NPD teams that shared a market orientation also had higher levels of integration between R&D and marketing functions. In particular, Kohli and Jaworski (1990) stated that market orientation provided for a unified focus to innovation by functions within an organisation, while Jaworski and Kohli (1993) added that market orientation was linked to the development of efficient multi-disciplinary co-operation in NPD teams. As Dougherty (1993: 182) noted: "*without a common goal orientation, each function develops its own perceptions and thought worlds, which lead to interpretive barriers among them to the determent of the innovation process*".

Earle (1997) remarked that concept optimisation research, which focused on the early or front-end stages of the NPD process led to a more systematic and scientific method of product development. However, uptake of formal market-oriented research methodologies across sectors and industries remains low or is applied in an ad-hoc fashion (Nijssen and Frambach, 2000; Mahajan and Wind, 1992), which is considered a significant contributor to low success rates in product development (Wind and

Mahajan, 1997). Kohli and Jaworski (1990) remarked that gathering customer information through formal concept optimisation research methods resulted in information that could be more easily disseminated throughout the organisation. More importantly, advanced concept optimisation research methods facilitate closer integration between technical R&D and marketing functions in the product development process (Arteaga *et al*., 1994). Conjoint analysis is one such market-oriented technique, which promotes the integration of technical R&D and marketing information through the generation of information on customers' preferences for new product concepts. The information generated can then be used to guide the technical development of new products. Conjoint analysis is a multivariate technique that models the purchase decision-making process though an analysis of purchaser trade-offs among hypothetical multi-attribute products (American Marketing Association, 1992). Conjoint analysis has been used to evaluate alternative marketing strategies for the purpose of market segmentation, price sensitivity analysis, and the identification of suitable product positioning strategies (Green and Krieger, 1991a; Wittink and Cattin, 1989). In the food sector, conjoint analysis has been used to identify the key product design attributes that influenced purchasers' preferences for existing and new hypothetical wines, and in the development of a range of functional meal replacement beverages for specific market segments respectively (Bogue *et al*., 2005a; Gil and Sánchez, 1997). The third dimension of Narver and Slater's (1990) conceptualisation of market orientation is the adoption of a competitor orientation.

4.9 A Competitor Orientation in Product Development

Day and Wensley (1988) argue that a customer orientation and inter-departmental co-ordination are central to the successful implementation of business strategies, as a consequence of the increasingly competitive nature of markets, and the increasing emphasis on delivering superior products or services to customers. Not surprisingly therefore, a competitor orientation is an integral element of Narver and Slater's (1990) behavioural components of market orientation, especially where firms need to constantly seek superior value to their competitors in order to prevent a firm's competitive advantage being eroded over time. Yasin and Zimmerer (1995: 28) defined a competitor orientation as "*an external activity that involved the investigation of a direct competitor*". Gatignon and Xuereb (1997) maintained that a certain level of competitor orientation was necessary in all organisations engaged in market and

product development. However, researchers such as Mann *et al*. (1999), Edgett and Snow (1997) and Song and Parry (1997) concluded that the importance of a competitor analysis to organisational performance depended upon the nature of the market, the type of new product developed, and the market entry strategy. For example, Song and Parry (1997) argued that firms with a strong technological orientation required a strong customer and competitor orientation due to the high level of risk associated with radical innovations, and the need to remain differentiated from competitors. Indeed, Gatignon and Xuereb (1997) argued that competitor orientation strategies were most applicable to firms that operated in high growth markets and deemed it important to develop innovations at lower cost. Furthermore, competing firms were expected to react faster and more aggressively in markets that exhibited high growth rates, thereby necessitating a strong customer orientation. In contrast, Mann *et al*. (1999) argued that a competitor orientation was less important to firms pursuing a niche entry strategy as this form of entry strategy was considered to attract considerably less competitive reaction from competitors. Also, Edgett and Snow (1997) found that the type of product developed also had a significant bearing on the expected reaction from competitors, and consequently, the importance of a competitor orientation. Specifically, pursuance of radical innovations was expected to necessitate high levels of customer orientation, and low levels of competitor orientation, at the early stages of the product lifecycle. Irrespective to the type of new product developed, Harmsen *et al.* (2000) reiterated that a competitor orientation was a central characteristic of the market-oriented organisation.

4.10 Summary

This chapter investigated the importance of market orientation in business, and linked elements of market-orientation to improved knowledge management and overall business performance. The importance of customer integration during the early stages of the NPD process was also highlighted. An important market that has experienced high levels of NPD activities in recent years, which would benefit from a market-oriented approach to innovation, is the functional food and beverages market. In Chapter 5 the evolution of the functional food and beverages market in terms of key market and NPD trends is examined, and the strategic marketing of functional foods and beverages is discussed.

Chapter 5: Functional Foods and Beverages: Strategic Marketing and New Product Development Issues

5.1 Introduction

Chapter four examined the importance of market orientation to knowledge management within the overall NPD process, and its contribution to overall business performance. Market orientation was considered an important strategic orientation for firms that sought a sustainable competitive advantage in rapidly changing markets, through the efficient management of knowledge, which created superior value from the customer's perspective. In particular, strategic reviews of the Irish Food Industry emphasised the need to increase the levels of market orientation in firms, in order to respond to emerging food trends, with particular reference to emerging market opportunities for functional foods and beverages. The evolution of the healthy foods market is outlined in this chapter and the market drivers for healthy and functional foods and beverages are discussed. The current market and new product trends for functional foods and beverages are also examined. Finally, strategic marketing and product development issues pertaining to functional products are reviewed and discussed in this chapter.

5.2 Diet-health Relationship: The Evolution of the Healthy Foods Market

Moon *et al*. (1998) reported that customer food trends evolved over the last four decades in line with changes in customers' lifestyles and living standards. McMahon (1996) stated that customers' concerns had changed from fears of food insecurity to concerns that related to the choice of foods consumed, and specifically, the influence of dietary and lifestyle factors on human health. McMahon and Cameron (1998) and Roberts *et al*. (1998) believed that customers' growing health consciousness could be attributed to increased media interest and coverage of scientific evidence that linked poor dietary behaviour and food choice practices to an increased risk of heart disease, cancer and obesity. For example, Simopoulos (2002) and Kris-Etherton *et al*. (2002) reported that the western diet was traditionally characterised by elevated levels of saturated fatty acids[14], which were associated with a higher risk from heart disease. However, Eurostat (2005) and the World Health Organisation (1998) reported that mortality rates for heart

[14] Triglycerides composed primarily of saturated fatty acids are most commonly derived from animal fats and manufactured foods that contain tropical oils such as palm kernel oil and coconut oil (Volker and Garg, 2001).

disease had fallen in many countries. Messenger (1995) had earlier attributed the continued decline in the incidence of heart disease to the alteration of both qualitative and quantitative aspects of fat intake in the western diet, as well as the adoption of healthier lifestyles. In that context, Schwartz and Borra (1997) and Wandel (1997) believed that increased media interest in diet and health had brought dietary behavioural issues to the forefront of customers' consciousness. Similarly, Ottersdorf (1998), Morreale and Schwartz (1995) and Byrd-Bredbenner (1994) affirmed that customers' aspirations towards healthy living had increased in both the US and Europe concurrently to increased customer awareness of the high incidence of chronic illnesses such as heart disease and cancer. In particular, O' Keefe (2000) added that public health practitioners had been successful in increasing customer awareness of the link between dietary fat and heart disease. Not surprisingly, Traill and Pitts (1998) stated that increased customer interest in healthy eating had been a major growth trend for the food and beverage industry worldwide, and a significant driver of NPD for lighter foods and beverages[15]. In fact, Leatherhead Food Research Association (2004a) estimated that the global lighter food and beverages market was valued at US$63.2bn in 2002. However, while customers appeared to have made some positive dietary behavioural changes, Cordain *et al*. (2005) and Allison *et al*. (1999) affirmed that chronic diseases and health problems associated with poor dietary habits still represented a serious threat to public health in developed countries.

The Organisation for Economic Co-operation and Development (OECD) (2005) stated that obesity rates had increased in most countries over the last twenty years, which indicated a continual population shift away from a normal healthy weight range. For example, the percentage of obese people in the UK increased by approximately 200 per cent between 1980 and 2000, while the percentage of obese people in Ireland increased by 30 per cent from 10 to 13 per cent of the total population between 2000 and 2005 (Organisation for Economic Co-operation and Development, 2005). Furthermore, the International Obesity Task Force (2005) predicted that cases of diabetes mellitus[16] in adults would more than double globally, from 143 million in 1997 to 300 million by 2025, attributed largely to dietary and other lifestyle factors. More worryingly, Lobstein

[15] The Food and Drug Administration (FDA) in the US define lighter foods and beverages as foods and beverages that contain 50 per cent less fat and 33 per cent less calories compared to a standard equivalent product (Shapiro, 1995).
[16] Diabetes mellitus is a group of metabolic disorders characterised by the abnormal metabolism of glucose and fat in the body which can lead to eye, kidney, nerve, or heart damage (Taylor, 2003).

and Frelut (2005) reported that childhood obesity levels exceeded 10 per cent in most European countries, while the International Obesity Task Force (2005) found that overweight and obesity levels exceeded 20 per cent among children aged 7 to 11 years in both the UK and Ireland. In that context, the World Health Organisation (1998) had earlier warned that the time lag between the onset of obesity, and the subsequent increase in diet-related chronic diseases such as diabetes mellitus, heart disease and cancer would have serious implications for future incidence of public health problems and healthcare costs.

Similarly, the American Cancer Society (2004) and the World Health Organisation (1998) reported dramatic changes in cancer occurrences in the last 20 years, where cancer overtook heart disease as the leading cause of death in many parts of the world. More specifically, the World Health Organisation (1998) reported that 30 per cent of tumours diagnosed in Western European countries and North America could be attributed to poor dietary habits and poor lifestyles. More so, Eurostat (2003) stated that an increased risk from intestinal cancer was associated with high alcohol, fat, and meat intake, and a diet that lacked essential micronutrients. Specifically, Eurostat (2003) reported that areas with high incidences of intestinal cancer were Ireland and the UK, Denmark, Germany and Austria, although sub-national contrasts were evident, which were attributed to regional eating habits. In particular, stomach cancers were associated with countries with high intakes of cured and smoked food, and a low intake of fruits and vegetables (Eurostat, 2003). Therefore, it was not surprising that the scientific community had begun to focus on the identification of key components of the human diet that could prevent disease and promote health and well-being.

5.3 The Disease Prevention Concept: The Role of Functional Foods and Beverages

Roberfroid (2000) stated that the disease prevention concept could be traced back to a policy of 'restoration' during the early part of the 20th Century where micronutrients such as vitamins and minerals were added back into foods to compensate for the loss of micronutrients during processing. Lambert (2001) maintained that interest in diet and health issues over the last twenty years primarily focused on the negative relationship between food choice and morbidity and mortality rates for a number of diseases such as heart disease and cancer. However, Greenberg and Graham (2000) and Hasler (1998a) highlighted numerous epidemiological studies that also linked certain food components

to a lower risk from certain chronic diseases. For example, Huijbregts (1997) and Nestle (1994) reported from their review of the literature that a diet rich in health-enhancing foods[17] such as fish, fruits and vegetables was associated with a reduced risk of heart disease and some forms of cancer. Similarly, epidemiological studies also confirmed the important role of folic acid[18] in the prevention of neural tube defects[19] in unborn children (Subar, 1989). Consequently, evidence of positive links between key food components and a reduced risk of disease, coupled with advances in technologies, eventually gave rise to the development of the functional food and beverages[20] category (Hasler, 1998a). On that basis, Norman and Bennett (1999) and Cardello (1995) stated that a strong argument existed from both an economic and public health perspective for the promotion of foods and beverages that could influence the progression of disease, alleviate or prevent disease, or promote long-term preventative therapies in human healthcare.

For example, the British Heart Foundation (2003) estimated that heart disease cost the UK approximately Stg£10bn year-on-year in lost production, and a further Stg£1.6bn year-on-year in medical costs. The International Obesity Task Force (2005) and Bender and Westgren (2001) argued that rising health costs could be countered through changes in the diet, which in turn could reduce the morbidity and mortality rates from chronic diseases in developed countries. For example, Desai (2001) estimated that cholesterol-lowering spreads alone had the potential to save the UK health system almost Stg£90m per year (Desai, 2001). Furthermore, Wojcik (2005) recently reported that VGZ, the largest health insurers in the Netherlands offered a reimbursement of €40 per annum to its 120,000 policyholders taking cholesterol-lowering drugs to encourage them to purchase cholesterol-lowering food products. This incentive was initiated to reduce VGZ's annual drug and hospitalisation costs for heart disease estimated at €35m per annum (Wojcik, 2005). Overall, Frewer *et al*. (2003) succinctly described the evolution of the healthy foods market from vitamin and mineral fortification (1st generation) to compensate for nutritional deficiencies, to high-fibre (2nd generation) and

[17] Health-enhancing foods and beverages may be defined as natural or manufactured foods, beverages or ingredients, which confer specific health-enhancing benefits beyond their basic nutritional functions (Bogue and Sorenson, 2001).
[18] Folic acid is a B-Vitamin that plays a vital role in the synthesis of nucleic acid and the development of a healthy spinal cord in unborn children (Wildman, 2001).
[19] A neural tube defect is a major birth defect caused by the abnormal development of the central nervous system as a consequence of an inadequate intake of folic acid during gestation (Wildman, 2001).
[20] A Functional food or beverage may be defined as: "*any modified food, beverage or food ingredient that may provide a health benefit beyond the traditional nutrients it contains*" (Young, 1995).

lighter (3rd generation) foods and beverages, and finally to functional foods (4th generation) with added functional ingredients to alleviate or prevent disease (See Figure 5.3.1).

Hasler (1998b) and Saguy and Moskowitz (1999) stated that increased customer understanding of the relationship between diet and health would become a key driver of NPD for functional foods and beverages. Greger (2001) suggested that the apparent increased use of dietary supplements and herbal remedies by customers in the US and Western Europe supported the argument of greater customer aspirations towards improved health through preventative measures, and potentially, through the use of functional foods and beverages. More importantly, Boyle and Emerton (2002) predicted that functional foods and beverages would indeed become more important in the future as both teenagers and younger adults, with the highest awareness of the link between diet and health, would move into the age group (35-59 years) most concerned about health and dietary issues. In particular, Moosa (2002) argued that dissatisfaction with modern day healthcare and increased healthcare costs among older adults would also drive the health and well-being market in future years. Gray *et al*. (2003) added that longer life expectancy as a consequence of an increasingly ageing population would drive further growth in the functional food and beverages market. For example, Ryan (2005) noted that the aging of the Irish population from 1.1m to 1.4m adults aged 50 years and over by 2015 would contribute to the future growth of the health and wellness market in Ireland. However, Hilliam and Young (2000) and Hasler (1998b) proposed that companies, rather than customers, had driven NPD activities in the functional food and beverages market.

5.4 Key Market Drivers and NPD Trends in the Functional Food and Beverages Market

Challener (2000) and Mirasol (1999) concurred that the interest shown by food and beverage, pharmaceutical and biotechnology firms in functional foods and beverages grew as a consequence of growing scientific knowledge of the relationship between diet and health, and technical advances within the food and beverage, pharmaceutical and biotechnology industries. Moosa (2002) stated that the maturation of existing food

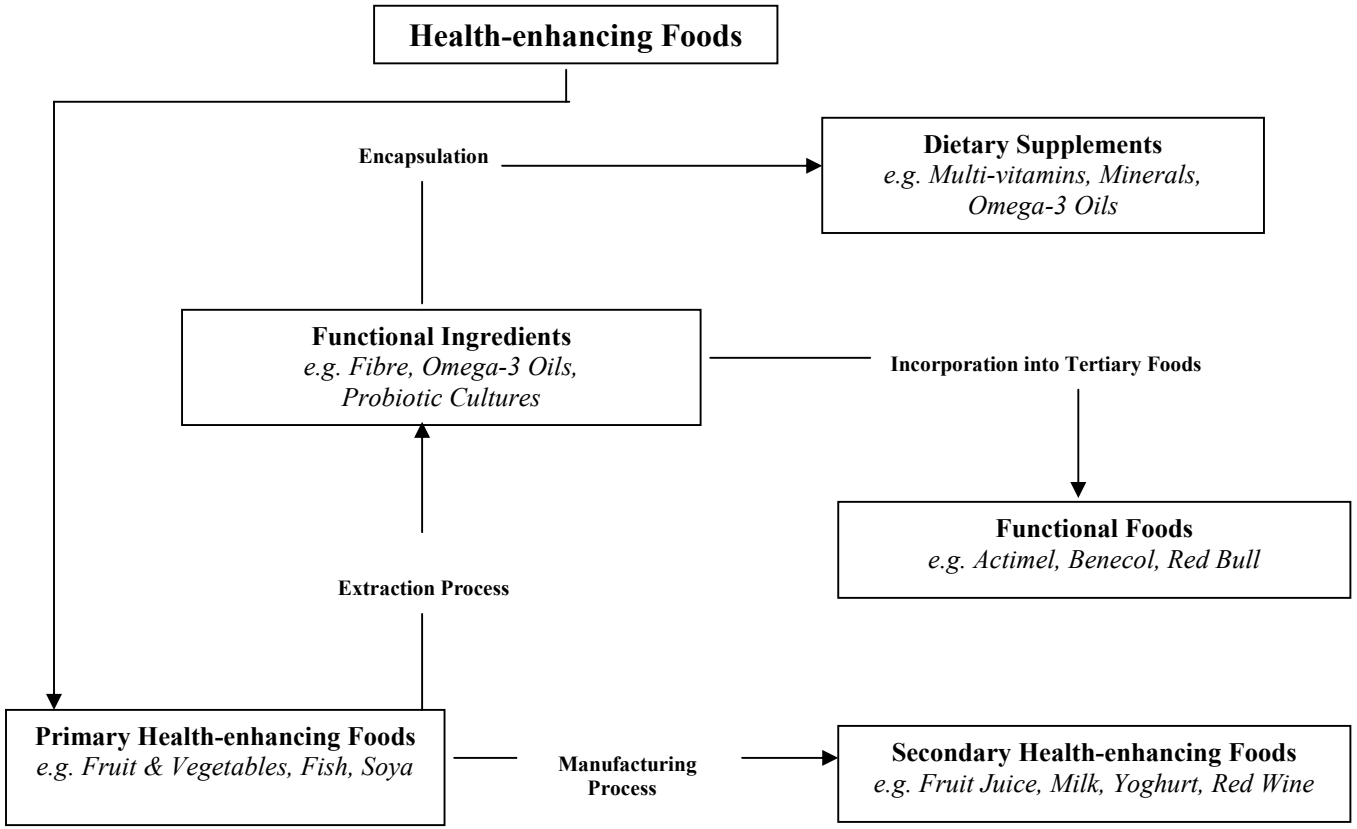


Figure 5.3.1: Typology of Health-enhancing and Functional Foods

Source: Adapted from Bogue and Sorenson (2001)

and beverage markets, increased competitive pressures, and the need for faster NPD cycles were also driving the food and beverage industry's interest in the functional food and beverages market. However, Milton (2003) argued that a market development strategy, which characterised the strategic orientation adopted by many food and beverage firms was primarily pursued to prevent cannibalisation of existing conventional products by new functional foods or beverages in existing categories. Longman (2001) added that consolidation within the food and beverage industry, coupled with aggressive acquisition strategies employed by large multi-national firms such as PepsiCo and Coca Cola, had further accelerated the growth of the functional food and beverage market from specialist to mainstream market channels. Leatherhead Food Research Association (2004b; 2003a) estimated that the global functional food and beverages market was valued at US$44.5bn in 2003 where non-dairy functional beverages and functional dairy products accounted for 45 per cent and 30 per cent of global value sales in 2003 respectively.

Hasler (1998b) had earlier stated that added value and the maximisation of profits, rather than societal benefits, were the primary motives behind the food and beverage industry's interest in functional foods and beverages. In fact, Moosa (2002) added that the attraction of the functional food and beverages market lay in adding value to otherwise conventional foods and beverages in reaction to the downward pressure on price, where customers increasingly sought value for money in their food and beverage choices. Sunley (2000) affirmed that the functional food and beverages category had indeed come to represent an important strategic and operational orientation for food and beverage, biotechnology and pharmaceutical firms during the 1990s. Specifically, Weststrate *et al*. (2002) and Shah (2001) remarked that the functional food and beverages category proved attractive to firms with an average growth rate that ranged from 15 to 20 per cent per annum, in comparison to growth rates of 2 to 4 per cent per annum for both the general foods market and lighter food and beverages market. In fact, Wald *et al*. (2002) and Schmidt (2000) reported a gradual shift in emphasis by the food and beverage industry away from 'negative' lighter foods and beverages towards 'positive' functional foods and beverages. Overall, Longman (2001) linked increased interest in functional foods and beverages amongst food and beverage firms to the maturation of the general healthy foods market. This was attributed to both the inability of lighter food and beverage markets to develop and maintain premiums, and

customers' negative perceptions towards lighter foods in relation to trade-offs in terms of health benefits and sensory character. Consequently, whereas the lighter food and beverages category experienced high levels of NPD activities over the last two decades, Boyle (2002) and Leatherhead Food Research Association (1999) predicted that functional foods and beverages would dominate NPD activities in the overall healthy foods market over the next two decades.

Tellingly, two industrial surveys of European firms pursuing market opportunities with functional foods and beverages, conducted in 2000 and 2004, revealed that the functional food and beverages category remained a high priority long-term strategy for ingredients manufacturers. In contrast, the functional food and beverages category only represented a medium priority short-to-medium-term strategy for food and beverage manufacturers (Leatherhead Food Research Association, 2004b; Hilliam and Young, 2000). As Frewer *et al*. (2003) remarked, although the functional food and beverages category experienced phenomenal growth rates of 15 to 20 per cent in the last 10 years, it still comprised a very small share of the total global food and beverages market. Not withstanding this, Leatherhead Food Research Association (2004b) argued that firms that invested in R&D and were committed to meeting market demands would be at the forefront of developments in the functional food and beverages market. Importantly, Longman (2001) warned that functional food and beverage innovations in Western Europe were considerably lower than in Asia and North America, and warned that Western European firms could lose competitiveness in the future. For example, although Feeney (2002) predicted that the value of the Irish functional food and beverages market would rise from €25m to €200m by 2007, he warned that Irish food and beverage firms would need to increase technological and market orientation levels to maintain competitiveness in the global functional food and beverages market.

5.4.1 The Market and Technical Development of Functional Foods and Beverages

Heasman and Mellentin (2001) stressed that the technical development and strategic marketing of functional foods and beverages presented enormous challenges to food, pharmaceutical and biotechnology firms, as functional foods differed from conventional foods, and even healthy foods, such as lighter and high-fibre foods in a number of respects. Hasler (1996) stated that lighter and high-fibre foods and beverages were positioned as healthy alternatives, which could promote general well-being as part

of a healthy diet. In contrast, the therapeutic benefits of functional ingredients, added to foods or beverages, were directly linked to a reduced risk from certain chronic conditions or ailments. From a technological perspective, Diplock *et al*. (1999) warned that there were efficacy issues that concerned the scientific validation of the therapeutic benefits of functional ingredients through epidemiological and clinical trials. From a marketing perspective, Diplock *et al*. (1999) also argued that there were considerable challenges for firms in terms of communication of the benefits of functional foods and beverages to customers, particularly in the absence of consensus on legislation at EU level on the permissibility of health claims. More so, Frewer *et al*. (2003) and Menrad (2003) stressed that there were also issues of credibility regarding physiological claims[21], and credibility in functional food and beverage brands, linked back to customers' negative attitudes towards, and poor knowledge of, the benefits associated with functional foods and beverages.

Furthermore, Heasman and Mellentin (2001) recounted the difficulties faced by food and beverage manufacturers in the identification of customer groups to target with new and innovative functional foods and beverages. Wennström (2000) reported that many new functional foods and beverges met with poor customer acceptance. Not surprisingly, Heasman and Mellentin (2001) claimed that 70 to 90 per cent of new functional foods and beverages failed within the first year, and high profile new functional food product failures included Kellogg's *Ensemble*, Campbell's *Intelligent Cuisine*, Nestlé's *LC1*, and Novartis' *Aviva*. Overall, Bistrom and Nordstrom (2002), Heasman and Mellentin (2001) and Hilliam and Young (2000) summarised the key factors for new product success in the functional food and beverage market as: overcoming customer acceptance issues; proof of efficacy; legislative issues concerning the promotion of functional foods and beverages making therapeutic claims; product promotion and customer education; and the identification and selection of key target markets. In particular, Gray *et al*. (2003) emphasised that the development of the functional food and beverages market depended upon sensory acceptance of functional products by customers in terms of taste parity with conventional products.

[21] Physiological health claims refer to product-specific claims where the consumption of a certain functional ingredient or food or beverage can be linked to improved physiological functions such as 'aids the immune system', 'lowers cholesterol' or 'keeps your heart healthy' (Shapiro, 1995).

5.5 Customer Acceptance of Functional Foods and Beverages: Market Segmentation and Market-oriented Concept Optimisation

Although researchers such as Bogue and Sorenson (2001), Poulsen (1999) and Gilbert (1997) concluded that customers were generally unaware of the health benefits associated with many functional foods and beverages, other researchers such as Wansink *et al*. (2005), the National Institute of Nutrition (2000) and Bogue and Ryan (1999) had found that interest in the concept of functional foods and beverages among US, Canadian and Irish customers respectively remained high. More specifically, while the International Food Information Council (2002) and Gilbert (2000) reported that previous US customer studies in the early 1990s revealed high customer awareness and interest in functional products, more recent US studies reported lower frequencies of healthy food consumption, and lower intentions to purchase functional foods and beverages than in previous studies. Similarly, although Bogue and Ryan (1999) found high levels of customer interest in functional foods in Ireland, Bogue *et al*. (2005b) more recently reported low intentions among Irish customers to change their present dietary behaviours. Heasman and Mellentin (2001) believed that the 'breakthrough' nature of functional foods and beverages, and its inherent influence on customer acceptance, helped explain customers' low purchase intentions towards functional foods and beverages. Challener (2000) and Hasler (1996) characterised functional foods and beverages as 'breakthrough' products that on one hand could provide value to customers, while on the other hand potentially deliver long-term profitability and competitive advantage in the marketplace. However, Samli and Weber (2000) warned that although 'breakthrough' products potentially offered value or benefits to customers over incumbent products, customer acceptance of novel 'breakthrough' products such as functional foods and beverages was slower than for conventional products.

Numerous studies have characterised the 'functional food customer' as well educated females aged 35-55 years based upon their positive health beliefs and attitudes towards diet and health (Bogue *et al*., 2005b; Bogue and Ryan, 1999; International Food Information Council, 1999; Childs, 1997; Gilbert, 1997). However, Jonas and Beckmann (1998) warned of potential pitfalls for firms that sought opportunities in the functional food and beverages market, owing to socio-demographic and socio-cultural differences in customers' perceptions and acceptance of functional foods and beverages (Bech-Larsen *et al*., 2001; Poulsen, 1999). Similar findings led Frewer *et al*. (2003) to

conclude that customer acceptability of functional foods was mixed, and susceptible to both individual and cross-cultural differences. Verbeke (2004) and Saher *et al*. (2004) also concluded that difficulties in targeting cognitively and attitudinally differentiated market segments, both within and across countries, presented challenges for firms pursuing opportunities in the global functional food and beverages market. In that sense, Heasman and Mellentin (2001) stressed the importance of identifying and profiling those niche market segments that were lifestyle or needs driven, and perceived value from functional foods and beverages, for new product success. As Wennström and Mellentin (2003: 44) posited: "*the key to a winning strategy [for functional foods] is to identify a single bridgehead of pragmatic consumers in a mainstream market and to accelerate the formation of 100 per cent of their whole product. The goal is to win a niche foothold in the mainstream as quickly as possible*".

The functional food and beverages category remains an important potential growth market for many food and beverage, pharmaceutical and biotechnology firms. However, there is growing evidence of the importance for integrating customers' views during the early stages of the NPD process in order to minimise customer acceptance problems associated with 'breakthrough' functional food and beverages. Worryingly, Salavou and Lioukas (2003) and Heasman and Mellentin (2001) maintained that science push[22] rather than customer pull[23] strategic orientations characterised the NPD activities of many food and beverage firms. Not surprisingly therefore, Hilliam and Young (2000) reported that stakeholders in the functional products market believed food and beverage companies, and not customers, were the main drivers of NPD activities for functional foods and beverages. However, Wennström and Mellentin (2003) warned that, for technology-oriented firms, a differentiation strategy based solely on functionality and associated health benefits offered a short-term competitive advantage only. In particular, Verbeke (2004) argued that the high reported failure rates for functional food and beverages suggested that customer acceptance issues were either ignored or poorly understood by firms. As Wennström and Mellentin (2003: 21) argued: "*often technology is used to create value for the producer and this can sometimes be a very*

[22] Science push refers to firms pushing arguments from science to the customer to differentiate products. Consequently, the customer must therefore understand, or have the motivation to understand, the science behind functional foods or beverages (Wennström and Mellentin, 2003).
[23] Customer pull refers to firms pulling arguments from the customer into the organisation to adapt science to what the customer needs and desires from functional foods or beverages (Wennström and Mellentin, 2003).

different matter from creating customer value". For example, van Kleef *et al*. (2002) revealed that although firms placed greater emphasis on supplements as carriers for functional ingredients over food products, customers placed a lower value on dietary supplements than on foods and beverages as carriers for functional ingredients.

More so, researchers such as van Kleef *et al*. (2005b), Urala and Lahteenmaki (2004), DeJong *et al*. (2003) and Bech-Larsen *et al*. (2001) have argued against generalising customers' interest in, and purchase intention towards, functional foods and beverages, owing to the importance of the base product selected for enrichment with functional ingredients. For example, Poulsen (1999) found that the choice of functional ingredient and the choice of carrier or base product strongly influenced customers' attitudes and acceptance of functional foods and beverages, and similar finding have been reported elsewhere (Newsholme, 2002; Bogue and Sorenson, 2001). More specifically, Nordstrom and Bistrom (2002) concluded that the dominance of one functional variant over another, such as probiotic yoghurts versus probiotic juices, depended upon the carrier to which the functional ingredient was added, and concluded that the selection of the carrier or base product was critical to achieving market dominance and overall customer acceptance.

Furthermore, Urala and Lahteenmaki (2003) maintained that healthiness in functional foods and beverages could be considered a multi-dimensional choice factor, where health could be perceived in many ways depending on the carrier or base product, and the health benefit associated with a specific functional ingredient. For example, Urala and Lahteenmaki (2003) found that healthiness was linked to general well-being in functional ice-cream while healthiness was linked to disease prevention in spreads. Also, Bech-Larsen *et al*. (2001) observed that customers were negative towards the addition of functional ingredients to products perceived as natural such as juice, while customers were more positive towards functional foods where the base product was perceived as processed, such as margarine. Consequently, Frewer *et al*. (2003) believed that there was a risk that functional foods would be perceived as less natural than conventional products, and thus, avoided by customer groups that sought or valued wholesome foods. Overall, Urala and Lahteenmaki (2004) argued that the rationale for customers' choice motives between conventional and functional foods and beverages differed within product categories. Urala and Lahteenmaki (2004) concluded that

functional foods and beverages should therefore be viewed as choice alternatives within different product categories rather than a specific category of homogenous products.

Childs and Poryzees (1997) and Gilbert (1997) considered customer behaviour research a key success factor in the development of the functional food and beverages category. More so, Weststrate *et al*. (2002) and Grunert *et al*. (2001) considered customer acceptance of functional foods and beverages, and an understanding of its determinants, key success factors for the exploitation of commercial opportunities in the functional food and beverages market. However, Gilbert (1997) also concluded that firms lacked a genuine understanding of customers' needs and preferences, and failed to identify distinct market segments for functional foods and beverages. In that context, Bogue *et al*. (2005a; 1999) and van Kleef *et al*. (2002) strongly argued for the integration of customers with the NPD process in order to bring NPD practitioners closer to understanding customers' needs and wants. According to Hehn (2001: 40): "*market intelligence is a precondition for being able to effectively innovate and, therefore, successfully serve these newly emerging markets*". Chemical Market Reporter (1999) emphasised the importance of market-oriented research methodologies during the concept development stage of the NPD process in terms of defining target customer groups, and ascertaining the feasibility and level of market acceptance of potential products. Van Kleef *et al*. (2002) believed the integration of the customer with the NPD process could overcome confusion and uncertainty concerning new product ideas, and particularly, "*new-to-the-world*" functional product concepts. As a consequence of customers' differing preferences for functional foods and beverages, both within and across categories, market-oriented research methodologies have a critical role to play in providing guidance to NPD practitioners through screening, identifying and refining new product opportunities during the early stages of the multi-disciplinary NPD process (Bogue *et al*., 2005a).

5.5.1 A Multi-disciplinary Approach to Developing Functional Foods and Beverages

Sloan (2000a) and the National Institute of Nutrition (2000) reported that a number of customer behaviour studies in both the EU and US had sought to generalise customers' purchase intensions towards functional foods based upon attitudes and lifestyle factors, health-related concerns, and interest in the health benefits afforded by specific

functional ingredients. However, Hill *et al*. (2002) argued that this one-dimensional approach to market segmentation negated the extremely important role of other factors such as taste in food choice and customer acceptability. This issue is of particular relevance to the technical development and strategic marketing of functional foods and beverages where Drewnowski and Gomez-Carneros (2000) note that bitter, acrid or astringent off-flavours accompany the addition of functional ingredients to many foods and beverages. For example, LeClair (2000) reported that increased protein levels and vitamin and mineral fortification gave rise to off-flavours in many foods and beverages. Similarly, Camire (2000) reported that the addition of ginseng[24] at levels necessary to provide a stimulant effect resulted in a medicinal taste to functional beverages. Also, Luckow and Delahunty (2004a; 2004b) noted that off-flavours associated with probiotic bacteria were more pronounced in non-dairy products such as orange juice and less pronounced in dairy products such as yoghurt and yoghurt drinks. In that context, Foote (2002) and Brandt (2000) argued that even though functional beverages offered health benefits, off-flavours could act as a deterrent to customer acceptance, particularly when beverages lost their refreshment and pleasure appeal. In particular, taste parity was considered a key success factor for functional products according to Leatherhead Food Research Association (2004b).

Although the primary role of taste as a factor influencing customers' food choices has been voiced by many researchers (Grunert *et al*., 2001; Richardson *et al*., 1994; Shepherd, 1990), others have argued that the 'breakthrough' nature of functional foods and beverages in terms of the associated health benefits would mitigate off-flavours associated with functional products (Reineccius, 2000; Kahkonen *et al*., 1996; Vickers, 1993). For example, customers would be expected to make minor trade-offs in taste in order to obtain or achieve the desired benefits from functional products. This argument was based upon the important influence of health in food choice (Lappalainen *et al*., 1998), that the associated health benefits were strong positive determinants of both functional food acceptance and willingness to compromise on taste (Reineccius, 2000; Kahkonen *et al*., 1996), and the belief that sustained consumption would lead to acceptance of an inferior sensory profile in functional foods and beverages (Tuorila *et*

[24] Ginseng is a perennial herb derived from the genus *Panax* and is indigenous to Korea, China, Vietnam, Japan, India and North America. It is used mainly to aid physical performance, stimulate the immune system and aid cognitive function (Mazza and Oomah, 2000).

al., 1998). For example, Vickers (1993) showed through conjoint analysis that variations in the health benefit attribute influenced purchase intent for functional strawberry yoghurts. Kahkonen *et al*. (1996) also posited that high customer value for health benefits would yield high hedonic preference scores for functional foods and beverages. However, Nordstrom and Bistrom (2002) and Porcherot and Issanchou (1998) argued that customer trade-offs between taste and functionality could only be achieved where the associated health benefit had an immediate beneficial effect on the health and well-being of customers.

Clearly, while health beliefs and attitudes exert a strong influence on purchase intent towards functional foods and beverages, other food-related factors exert an equal if not greater influence on customers' food choice motives. For example, Bech-Larsen *et al*. (2001) and Poulsen (1999) found that Danish customers' purchase intentions towards functional breads were explained by dietary convenience (42%), price (21%), naturalness (18%), functionality (14%), familial concerns (9%), and dosage (5%). Similarly, although health represented an important driver of NPD in the food industry, MarketWatch (2005) and Wakeling (2004) remarked that other major food trend factors had simultaneously evolved such as ethnicity and food safety. Also, Dairy Foods (2004a) reported that changes in customers' lifestyles and values also meant that convenience, mood-enhancement, and self-indulgence were key drivers of customer-led innovation in the global food industry. In that context, Leatherhead Food Research Association (2004b), Wennström and Mellentin (2003) and Hilliam and Young (2000) predicted that functional products that married convenience and health or health and sensory pleasure were most likely to gain commercial success in the functional food and beverages market.

Furthermore, although Tuorila *et al*. (1998) found that an expected health benefit did indeed increase customers' purchase intent for functional products, it did not impact on customers' overall hedonic preference scores. In particular, numerous studies have identified the importance of taste over functionality in food choice for healthy and functional foods, (Urala and Lahteenmaki, 2003; Tuorila and Cardello, 2002; Zanoli and Naspetti, 2002; Gilbert, 2000; Poulsen, 1999; Nielsen *et al*., 1998; Wardle, 1993). Augustin (2001) remarked that although customers desired foods and beverages associated with maintenance of health and well-being, they were unwilling to

compromise on taste, convenience or value. For example, Bech-Larsen *et al*. (2001) found that convenience, taste, and wholesomeness most influenced customers' purchase intentions towards a range of functional foods. More recently, Tuorila and Cardello (2002) reported that although health information exerted a positive influence on purchase intent, so hedonic liking was an important predictor of consumption, particularly for products that required consumption over an extended period such as functional foods and beverages. Overall, Tuorila and Cardello (2002) concluded that customers were unwilling to compromise taste for putative functional benefits.

Furthermore, Luckow and Delahunty (2004b) found no statistical relationship between socio-demographic variables and acceptance of off-flavours in probiotic non-dairy juice drinks. More so, Luckow and Delahunty (2004b) found that present purchase intent for probiotic dairy products was not positively associated for either increased liking for or acceptance of off-flavours associated with probiotic non-dairy juice drinks. These findings supported Tuorila and Cardello's (2002) argument that a firm's product development activities should incorporate both market and sensory preferences to enhance repurchase probability, in order to overcome monotony and sensory specific satiety from repeated consumption of functional foods or beverages. In particular, Sarubin (2000) had earlier warned that off-flavours could discourage sustained consumption required for obtaining maximum benefits of functional foods and beverages. Consequently, the functional food and beverages market presents a major challenge to firms seeking to develop functional products that not only improve health, but also satisfy customers' basic requirements for convenience and sensory pleasure.

Overall, Heasman and Mellentin (2001) reported that many food and beverage, pharmaceutical and biotechnology firms relied solely on functionality vis-à-vis the associated health benefits to leverage competitive advantage in the functional food and beverages market. However, Cavallo (2000) maintained that the functional food and beverage industry to date had failed to appreciate that health benefits were secondary to taste and overall appeal. As Milton (2003: 20) argued: "*new functional products must taste and look good, meet a consumer need, fit into consumers' lifestyles and then offer a functional and emotional benefit*". For example, Bogue *et al*. (2005a) investigated customer acceptance of functional meal replacement beverages and found that only one out of five segments prioritised functionality over other attributes such as price or taste.

Bogue *et al*. (2005a) concluded that further integration between the marketing and technical R&D functions was necessary to successfully pursue new product opportunities with customer-led meal replacement beverages in the functional food and beverages market. Dekker and Linnemann (1998) also warned that firms needed to adopt processes and activities that promoted multi-functional product development in increasingly competitive markets. Hoopes (2001) believed that integration of the relevant NPD functions facilitated effective co-ordination throughout the NPD process, and increased the extent to which each department understood the other's constraints. In effect, the multi-functional approach to NPD facilitates co-operation, co-ordination, and knowledge sharing within organisations. Bogue *et al*. (2005a) argued that further integration between functions could be facilitated through the use of advanced concept optimisation research methodologies such as focus groups, conjoint and sensory analysis, which could help identify the optimal extrinsic and intrinsic attributes driving customers' preferences and acceptance of functional foods and beverages.

5.6 Strategic Marketing Decisions for Functional Foods and Beverages

Shapiro (1995) reported that differences in food labelling legislation, particularly between the US, Japan and the EU, were likely to constrain the development of global functional food and beverage brands. Specifically, Shapiro (1995) stated that the Nutrition Labelling and Education Act (1990) and the Dietary Supplement Health and Education Act (1994) permitted the use of certain health claims for functional foods and beverages in the US. Similarly, Shimizu (2002) reported that the Japanese Government introduced the Nutrition Improvement Act (1991), which established efficacy guidelines for the marketing of functional foods and beverages bearing health claims. In contrast, Berner and O' Donnell (1998) and Childs (1994) stated that the European functional food and beverages market was heavily regulated where EU Directives 89/398/EEC and 90/496/EEC prohibited the sale of functional foods and beverages carrying medicinal or therapeutic claims. In that context, Childs (1998) concurred that regulatory issues were significant limiting factors that constrained both the development of the functional food and beverages market in Europe, and the emergence of global functional food and beverage brands.

However, the European Advisory Services (1999) reported that there were substantial variations in national laws between EU member countries governing the use of

physiological health claims, which had given rise to customer confusion and mistrust in functional foods and beverages. For example, Goldberg (1994) reported on several studies where customers felt national governments had failed to protect customers from unsubstantiated physiological health claims. More so, Dibb (1997) called for a moratorium on physiological health claims until such time as physiological claims were substantiated by scientific evidence, and regulated by appropriate food labelling legislation. More recently, Hunter (2002), Newsholme (2002), Bogue and Sorenson (2001) and Mintel (1999) reported customers remained sceptical towards many physiological claims made by functional food and beverage manufacturers. Frewer *et al*. (2003) and Kwak and Jukes (2001) agreed that food labelling legislation and regulations were policy areas that were becoming increasingly important to ensure customer confidence in the integrity of functional foods and beverages. Leatherhead Food Research Association (2004b) argued that proof of efficacy would become more important to the marketing of functional foods and beverages in the future, where scientific evidence supporting such claims would help customers regain trust in both the food industry, and in the science underpinning functional foods and beverages.

In contrast, Heasman and Mellentin (2001) argued that the perceived importance placed by firms on health claims would diminish as a consequence of: increased costs associated with efficacy of claims; the continued prohibition on therapeutic health claims; and ease of entry into the market with generic physiological health claims. Instead, Bogue *et al*. (2005b) and Wennström and Mellentin (2003) argued that a lack of customer education on the multi-faceted relationships between diet and health, rather than the permissibility of health claims, had constrained the development of the global functional food and beverages market. Specifically, the multi-faceted nature of functional food knowledge ranges from: belief in the relationship between nutrition and health (Wrick, 1995); belief in the influence of diet on health (Hilliam, 1996); belief in the disease prevention concept (Childs, 1997; Wrick, 1995); to customers' attitudes and perceptions towards health claims (Bech-Larsen and Grunert, 2003). For example, researchers such as Blaylock *et al*. (1999), Harnack *et al*. (1997) and Tepper *et al*. (1997) concluded that customer knowledge of the relationship between nutrition, diet and health was a prerequisite to making positive dietary behavioural changes. In that context, Asp (1999), the International Food Information Council (1999) and Buttriss

(1997) argued that many customers did not possess the requisite knowledge to translate healthy eating messages into positive dietary behaviours.

Importantly, the provision of physiological health claims is based on the premise that customers do indeed possess the requisite knowledge to link physiological claims to a reduced risk from certain diseases (Hasler, 1998b). Not surprisingly, Childs and Poryzees (1997) and Ford *et al*. (1996) found that physiological health claims did not influence customers' cognitive processing of nutrition information, and concluded that customer confusion regarding health claims was directly related to poor knowledge or understanding of the benefits associated with functional ingredients. More recently, Wansink *et al*. (2005) found that only when customers linked food attribute-related knowledge and consequence-related knowledge would customers then purchase functional foods and beverages. Wansink *et al*. (2005) therefore concluded that knowledge was most strongly linked to purchase intent for functional foods and beverages. Overall, Bogue *et al*. (2005b) and Wennström and Mellentin (2003) concluded that firms needed to increase customer awareness and understanding of functional ingredients, as well as customer acceptance of the benefits associated with functional ingredients, in order to be successful in the functional food and beverages market. In that context, Datamonitor (2005) and Mellentin (2004) reported that multi-national firms such as Kelloggs and Groupe Danone had successfully repositioned their corporate image from food manufacturers to health food companies, through strong investment in the promotion and communication strategies of their flagship functional food and beverage brands, as part of their long-term strategy for growth in the functional food and beverages market.

5.6.1 Price Optimisation Strategies for Functional Foods and Beverages

Mark-Herbert (2004) stated that functional foods and beverages had the potential to realise strategic competitive advantages for both manufacturers and retailers in terms of value creation for long-term growth and profitability. In fact, Heasman and Mellentin (2001) and Longman (2001) argued that a premium pricing strategy was a key objective for many firms that invested in innovation within the functional food and beverages market. Generally, functional foods and beverages have traditionally maintained a 10 to 20 per cent premium above the price of non-functional comparable products, although premiums associated with radical innovations such as Raisio's *Benecol* have been

reportedly higher (Maynard and Franklin, 2003; Heasman and Mellentin, 2001). However, Hilliam and Young (2000) questioned the sustainability of pricing strategies, which sought premiums of 100 to 500 per cent above standard conventional products. In fact, Heasman and Mellentin (2001) and Hilliam and Young (2000) attributed the comparatively poor performance or withdrawal of many high profile functional food brands such as Novartis' *Aviva*, Raisio's *Benecol* and General Mills' *Maval* to over-pricing, and specifically, the pursuance of a mass-marketed product through a premium pricing strategy.

Furthermore, von Alvensleben (2001) concluded that the wide scale use of generic claims made it increasingly difficult for firms to sustain super-premium price strategies. For example, Newsholme (2002) and Bogue and Sorenson (2001) reported that Raisio's *Benecol* remained undifferentiated from competitive products such as Unilever's *Flora*, which was perceived by customers to offer the same health benefit as *Benecol*, in terms of lowering cholesterol, but retailed at a considerably lower price. In contrast, Heasman and Mellentin (2001) noted the Groupe Danone had successful sustained a super-premium pricing strategy with *Actimel* as it represented a new product category, which made price comparisons difficult, and was positioned on both a health and convenience platform. Heasman and Mellentin (2001) and Von Alvensleben (2001) argued that, in future, customer tolerance of premium prices for functional foods and beverages would depend upon: the intended target market; the strength of the health proposition; the positioning strategy; and issues related to the product format such as naturalness, convenience or sensory pleasure. Wennström and Mellentin (2003) concluded that, in future, firms would need to identify the optimal pricing strategy or premium that customers would be willing to pay for specific functional foods and beverages, in order to remain competitive in the functional food and beverages market.

5.7 Summary

The emergence of functional foods and beverages has been a major influence on NPD activities in recent years, and an important strategic orientation for biotechnology, pharmaceutical and food and beverage manufacturers. Although the functional food and beverages market has experienced impressive growth rates over the last 10 to 15 years, failure rates for new functional food and beverage introductions have been reportedly high. This chapter reviewed the extant literature on the key drivers and factors for

success in the functional food and beverages market from both an NPD and strategic marketing perspective. The review of the literature illustrated that many of the key success factors for functional foods and beverages related directly to the customer with regard to customer acceptability, new product design issues and key strategic marketing decisions. These findings further support the argument for a more market-oriented approach to the design and strategic marketing of functional foods and beverages. The importance of functional beverages to the future development of the functional food and beverages market was also highlighted in this chapter. In Chapter 6 the key market dynamics and NPD trends driving growth in the global functional beverages market are examined.

Chapter 6: Functional Beverages: Market Dynamics, Trends and New Product Development Activities

6.1 Introduction

Chapter five reviewed the extant literature that pertained to the strategic marketing of functional foods and beverages. In this chapter, the market dynamics that prevail in the global functional beverages market are examined, and the current trends driving growth in the global functional beverages market are discussed. Particular emphasis is also placed upon NPD trends in the global functional beverages market. In this context, the three most important functional trends driving beverage sales growth and NPD activities are identified and discussed. Finally, the market drivers and NPD trends for fruit juice are discussed.

6.2 Global Beverage Trends and Market Dynamics

The global beverage industry has undergone major developments in recent years in response to increased globalisation and competition, as well as changing market dynamics and customer trends (Reavell, 1999). In the highly competitive global beverages market, Foote (2002) maintains that successful new product launches require a greater understanding of customer markets and current trends in order to anticipate changing customer tastes and needs. Food and beverage trends are considered the result of changes in customers' value systems, evidenced by changes in customers' purchase behaviours and consumption patterns (van Wave and Decker, 2003). For example, Beverage Industry (2003) attributed the decline in carbonated soft drink sales, and especially cola flavoured drinks, to lifestyle changes as customers sought alternatives that were natural and healthy. More specifically, Foote (2002) noted that beverage innovations in the last 10 to 15 years were influenced by five "*mega-trends*" that transcended cultural boundaries, and socio-demographic groups, which are wellness, convenience, pleasure, tradition and ethnic fusion.

Soft drink manufacturers have responded to changing customer tastes for beverages through the introduction of line extensions such as decaffeinated and sugar-free varieties of soft drinks on one hand, and new product introductions and innovations in new product categories on the other (Cherkassky, 2002; Reavell and Boyle, 2001).

Specifically, ING Barings (2001) and Nation's Restaurant News (1998) reported that the decline in sales of carbonated soft drinks, particularly in the maturing EU and US markets, was offset by significant growth in sales of non-carbonated soft drinks. In that context, Sarah (2001) remarked that beverage manufacturers were diversifying beyond their 'traditional boundaries' to acquire new products in niche markets. Indeed, Beverage Industry (2001a) maintained that firms had previously explored potentially large markets to compensate for the decline in carbonated soft drink sales. Holway (2000) remarked that globalisation was a key factor that influenced the dynamics of the global beverage industry over the last 10 years, where industries consolidated and large beverage firms grew and refocused their business activities. Indeed, Hehn (2001) noted that the three key trends that influenced the global beverage market over the last 10 years included increased concentration by larger multi-national beverage firms, the necessity to innovate, and the blurring between beverage categories. In addition, Hehn (2001) stated that beverage manufacturers had pursued aggressive joint venture, acquisition or merger strategies in the past to maintain global sales, to broaden their brand portfolio, or to gain market share in growth markets such as the functional beverages market.

For example, PepsiCo became a global player in the new age and energy drinks markets through its acquisition of South Beach Beverage Company in 2001 (Todd, 2003). Furthermore, PepsiCo's merger with the Quaker Oats Company in 2001 created the largest functional beverage company in the world (Bruss, 2002). This acquisitions and merger strategy gave PepsiCo access to the two most important growth markets over the last 10 years, chilled juice and sports and energy drinks, through its acquisition of the *Tropicana*, *Gatorade* and *SoBe* brands respectively (Sfiligoj, 2002). For example, this strategy allowed PepsiCo gain approximately 80 per cent and 75 per cent of value sales of sports drinks and chilled calcium-fortified juice respectively in the US in 2001 (Leatherhead Food Research Association, 2002a). Similarly, Coca-Cola pursued an acquisition strategy to gain increased market share in selected non-carbonated beverage categories such as new age drinks and chilled fruit juice (Halleron, 2001; Leatherhead Food Research Association, 2001a). In particular, Coca-Cola's purchase of Mad River Traders in 2000 and Odwalla in 2001 increased its overall market share in the smoothie, tea-based drink, new age and premium chilled orange juice categories in the US (Gourmet Retailer, 2001; Halleron, 2001).

Concurrently, Coca-Cola invested heavily in organic growth through its leading sports and energy drink brands such as *Aquarius*, *Burn*, *KMX* and *PowerAde* (Steiner, 2005; Leatherhead Food Research Association, 2002a). Furthermore, with increased competition in the US market across categories, Coca-Cola and PepsiCo also pursued a series of joint ventures with Groupe Danone and Novartis respectively, as they looked to international markets for market opportunities with both premium and functional chilled beverages (Leatherhead Food Research Association, 2002a).

Datamonitor (2004a) also reported that Groupe Danone pursued an aggressive acquisition strategy to become a global player in the bottled water market. Specifically, Groupe Danone sought to capitalise on increased consumption of mineral water through its strategic purchase of a number of mineral water brands. This was primarily achieved through its acquisition of Aquapenn in 1999 and McKesson in 2000, in addition to organic growth of the *Dannon*, *Volvic* and *Evian* brands worldwide (Leatherhead Food Research Association, 2002a; Butler, 2000). Subsequently, Groupe Danone led market and product development activities in calcium-fortified mineral water and near-water functional drinks (Johnson, 2004). More recently, Groupe Danone entered the ever-growing stimulant beverage segment of the sports and energy drinks market through its acquisition of Frucor Beverages and its flagship brand *V* in 2002 (Salway, 2002). In that context, Turcsik (2003) and Phillips (2000) remarked that the pressure on mainstream soft drink brands resulted in the introduction of a myriad of alternatives such as flavoured water, fruit juice drinks, ready-to-drink ice tea, sports and energy beverages[25] and functional beverages. Holway (2000) concurred with this view and reported that bottled water, fruit juice, and functional beverages were important markets for the future in terms of sustaining growth, which Prince (2002: 26) attributed to "*a growing health and well-being consciousness on the part of customers*".

Indeed, Jago (2000) considered functionality one of the most important drivers of NPD activities in recent years. Longman (2001) linked the increased demand for functional foods and beverages amongst customers to the maturation of the general healthy foods market. This was attributed to both the inability of the lighter food and

[25] Sports drinks are beverages that are designed to improve sporting performance, increase endurance and/or speed recovery. Energy drinks are beverages that claim to provide an energy or stimulation boost (Leatherhead Food Research Association, 2002b).

beverages market to develop and maintain premiums, and customers' negative perceptions towards lighter products in relation to trade-offs between health benefits and sensory character. Sloan (2000b) and Cavallo (2000) agreed upon the significant potential of future sales growth for functional foods and beverages. Cavallo (2000) had earlier predicted that the US functional food and beverages market would grow by 12.8 per cent to achieve sales worth US$10bn in 2004. The US functional beverage category was forecast to account for 78 per cent of the predicted growth, with sales of functional beverages expected to increase to US$6.9bn in 2004 (Cavallo, 2000). The significant growth predicted for functional beverages has been reported elsewhere. For example, Krause (2001) expected global functional beverage sales to increase by 70 per cent to US$24bn in 2005. Indeed, Leatherhead Food Research Association (2003a) estimated that the global and US functional beverages markets were valued at US$20.3bn and US$7.2bn respectively in 2003. However, Krause (2001) maintained that the ability to predict which product categories would experience strongest growth, and where customer demand could be expected in terms of the health benefits desired from functional foods and beverages, were significant considerations for functional food and beverage manufacturers. As Penn (2003: 44) noted: "*new drinks are the key to growth, but success hinges on having a crystal ball to customers*". Hilliam and Young (2000) concluded from their evaluation of the functional food and beverages market that sports and energy drinks, calcium-enriched juice and gut-benefit beverages dominated the global functional beverages market in recent years, not only in terms of value sales, but also in terms of increased NPD activity and new product launches.

6.3 Energy and Stimulant Drinks: Market Dynamics and NPD Trends

The global sports and energy drinks market has been the most dynamic soft drinks category over the last 10 years, not only in terms of high volume and value sales, but also in terms of the high levels of NPD activities. For example, Zenith International (2000) originally reported that consumption of energy drinks increased dramatically from 11m to 160m litres between 1993 and 1999 to account for 7.6 per cent of soft drink sales in Europe in 1999. Zenith International (2000) also reported that consumption of sports drinks, the more established of the two markets, also doubled from 300m to 600m litres between 1993 and 1999 to account for 28 per cent of functional drinks sales in Europe in 1999. However, the energy drinks market has grown substantially in subsequent years while volume sales of sports drinks have

remained static or declined over the same period. Specifically, Leatherhead Food Research Association (2003a) reported that volume sales of sports drinks in Europe dropped to 524m litres, while energy drinks increased to 385m litres in Europe in 2003. Boyle and Emerton (2002) identified the key growth factors for sports and energy drinks as: rising customer interest in health; a growing awareness of the benefits of exercise; and the need to cope with increasingly busier lifestyles. In particular, Leatherhead Food Research Association (2003b) argued that energy drinks benefited from greater customer demand for convenience, and especially for foods and drinks on-the-go.

Indeed, Zenith International (2002) reported increased usage of sports and energy drinks at work and in nightclubs among young adults in the UK. In that context, Leatherhead Food Research Association (2002b: 3) characterised the key purchasers of sport and energy drinks as "*young people who are aware of the positive, fashionable image that these products engender*". More specifically, Boyle and Emerton (2002) reported that adults aged between 19 and 34 years were the core target market for energy and stimulant drinks. Indeed, a number of customer studies that investigated stimulant drink consumption among soft drink purchasers in Ireland showed the highest prevalence of stimulant drink consumption among young adults aged between 19 and 24 years (Lansdowne Market Research, 2001; Safefood, 2001; Transition Management, 2001). More recently, Mintel (2004a) reported that purchase penetration of soft drinks in Ireland apparently declined with age, with the consumption of sports and energy drinks biased towards adults aged less than 39 years.

Leatherhead Food Research Association (2002b) predicted that global value sales of sports and energy drinks would increase by 40 per cent to US$15bn by 2006, with energy drinks expected to exhibit the fastest growth rate within the functional beverages market. Sports and energy drinks, and stimulant drinks in particular, have indeed continued to outperform other soft drink categories, both regular and functional, in terms of market growth, with sports (38.8%) and energy drinks (28.8%) accounting for over 67 per cent of global functional beverage sales in 2003 (Leatherhead Food Research Association, 2003a). According to Leatherhead Food Research Association (2003a; 2002b), combined global value sales of sports

(US$7.9bn) and energy drinks (US$5.9bn) increased by approximately 35 per cent from US$10.1bn to US$13.8bn between 2001 and 2003. The energy drinks category remains underdeveloped outside of Japan and the UK, and particularly in the US where sports drinks dominate the functional beverages market (Cosgrove, 2003). Japan (43%) and the UK (25%) represented the two most important markets for energy drinks with value sales of US$2.5bn and US$1.5bn in 2003 respectively (Leatherhead Food Research Association, 2003a). However, the UK was the most important market for energy drinks in volume terms with 37 per cent (249m litres) of global volume sales in 2003 (Leatherhead Food Research Association, 2003a; Zenith International, 2002). The impressive growth of the energy drinks market in the UK has also been mirrored in the Irish soft drinks market. According to Mintel (2004a) and Mintel (2002b), value sales of energy drinks in Ireland grew by 160 per cent between 1998 and 2003 to reach a value of €110.9m (US$123m) in 2003. Energy drinks accounted for 16 per cent of soft drink value sales in Ireland in 2003 and future value sales were expected to increase by 12 per cent year-on-year (Mintel, 2004a).

The UK energy drinks market while concentrated in terms of the number of large multi-national beverage firms remains fragmented in relation to the large number of brands launched (Leatherhead Food Research Association, 2003a; Zenith International, 2002). Leatherhead Food Research Association (2003a; 2002b) reported that NPD activities within the UK energy drinks market focused primarily on: new flavour line extensions; new package designs; new positioning strategies; differentiation in terms of functionality; and the marketing of energy drinks with alcohol. For example, Marketing Week UK (2001) and Cavanagh (2001a) reported on the large number of new energy drinks based on red berry and cola flavours such as Food brand's *Rocket Fuel* and Red Devil's *Power Cola*. Furthermore, Booth (2002) and In-store Marketing (2002) also reported that product formulations appeared to move away from citrus flavours towards other fruit-based flavours, and cranberry flavour in particular, such as Food Broker's *Spiked Silver* and Silver Arrow's *Revitalise Silver*. Leatherhead Food Research Association (2002b) noted that manufacturers in the UK and US, in order to differentiate their new product offerings from the standard 250ml slim can, had introduced a number of stimulant energy drinks in frosted glass and plastic bottles such as Silver Arrow's *Revitalise Silver* and Frucor's *V*. Furthermore, Leatherhead Food Research Association (2003a; 2002b)

stated that beverage manufacturers in the UK and US had also attempted to differentiate their energy drinks on the basis of a positioning strategy related to consumption occasion.

Zenith International (2002) reported that a number of recent stimulant drink introductions were positioned based upon superior functionality. For example, Cavanagh (2001b) recalled that Colt Beverage's *RAC 124* was designed to prevent long haul drivers falling asleep, while Reavell and Boyle (2001) reported that Crystal's *EJ-10* was designed to increase mental alertness and improve memory recall. Beverage manufacturers have also sought to further differentiate their energy drinks on the basis of the functional ingredients used by them. In terms of product differentiation on the basis of functionality, Hein (2005; 2001) and O' Rourke (2000) reported that numerous stimulant drink introductions in the UK and US replaced taurine [26] with more natural stimulant ingredients to include both ginseng and guarana[27] such as SoBe's *Tsunami* and Free Natural's *Organic Energy*, or guarana and ginkgo biloba[28] such as Natural Beverage's *Voodoo Rain*. In contrast, Japanese firms focused their NPD efforts on jelly-style energy drinks that contained royal jelly, taurine and multi-vitamins such as Taisho's *Lipovitan 811* to combat fatigue, and Otsuka's *Energen Fast Break* to replace lost energy (Datamonitor, 2004b; Leatherhead Food Research Association, 2003a).

Hehn (2001) expected that customers' positive associations and experiences with various herbal ingredients would increase their propensity to try new functional beverages. Indeed, Falkman (2000) had earlier expected the US nutraceuticals [29] market to grow from US$19.9bn in 1998 to US$27.5bn in 2003, with botanical[30] sales expected to grow by 15 per cent in value terms over the same period. In particular, Leatherhead Food Research Association (2002b) maintained that still juice and juice-based beverages, as a growing market, would benefit most from their association with

[26] Taurine is a colourless crystalline compound of neutral reaction found in the juices of muscle, especially in invertebrates, and obtained as a cleavage product of taurocholic acid (Russell and Williams, 1995).
[27] Guarana (*Paullina cupana*), a berry native to Venezuela and Northern Brazil, is chemically similar to caffeine with comparable stimulant effects (Safefood, 2001).
[28] Ginkgo biloba, extracted from the leaves of the *Ginkgo biloba* tree, is native to China. Ginkgo is believed to aid memory and recognition by increasing the flow of blood to the brain (Mazza and Oomah, 2000).
[29] A term used to describe medicinally or nutritionally-enhanced functional foods or beverages. Nutraceuticals may be defined as: "*parts of a food, that provide medical or health benefits, including the prevention and treatment of disease*" (Rapport and Lockwood, 2002).
[30] Botanicals are supplements that contain extracts or active ingredients from the roots, berries, seeds, stems, leaves, buds or flowers of plants (Wolinsky and Hickson, 2001).

vitamins, minerals and botanicals, and Weisberg (2001) and Howell (2000) reported an increased trend towards juices and juice drinks enriched with herbs, botanicals and nutraceuticals.

6.4 Gut-benefit Food and Beverages: Market Dynamics and NPD Trends

According to Leatherhead Food Research Association (2004b) the global market for gut-benefit dairy foods and beverages remains small within the context of the overall global healthy food and beverages market. However, Leatherhead Food Research Association (2004b; 2001b) and Mintel (2004b) reported that food and dairy companies were most active in terms of NPD of gut-benefit dairy foods and beverages, particularly in relation to probiotic dairy-based drinks where strong growth rates have been reported. Leatherhead Food Research Association (2001b) had earlier predicted that value sales of gut-benefit dairy foods and beverages outside of Japan would increase by 50 per cent to US$1.95bn by 2006, where probiotic drinks were expected to exhibit the fastest growth rate within the gut-benefit dairy food and beverages market. Indeed, gut-benefit dairy foods and beverages continued to outperform other dairy categories, in terms of market growth, where value sales of gut-benefit dairy foods and beverages outside of Japan reached US$2.08bn in 2004 (Leatherhead Food Research Association, 2004b). According to Leatherhead Food Research Association (2004b; 2001b), combined global value sales of gut-benefit dairy foods and beverages increased by approximately 50 per cent from US$3.0bn to US$4.5bn between 2001 and 2004. Japan represented the most important market for gut-benefit dairy foods and beverages with value sales of US$2.4bn in 2004, and accounted for 54 per cent of value sales in that year (Leatherhead Food Research Association, 2004b). However, the gut-benefit dairy food and beverages category remains underdeveloped outside of Japan, and particularly in the US where yoghurt and yoghurt drink consumption is generally low (Cosgrove, 2003). Spain, Germany and France represented the most important European markets for gut-benefit dairy foods and beverages and accounted for 11 per cent, 9 per cent and 8 per cent of global value sales in 2004 (Leatherhead Food Research Association, 2004b).

According to International Food Ingredients (2002), NPD activity focused on dairy-based beverages fortified with vitamins and minerals that contained probiotic cultures

and prebiotic ingredients[31] as customer interest in fibre-fortified beverages waned in the mid-nineties. While the US probiotic market remained underdeveloped in both volume and value terms, Leatherhead Food Research Association (2004b; 2001b) and Heasman and Mellentin (2001) reported the highest sales growth rates for probiotic products within the European Union. In particular, probiotic dairy drinks realised impressive sales growth between 1996 and 2000 to account for 32-36 per cent of the European probiotic dairy market in 2000 (Leatherhead Food Research Association, 2001b). Although sales of gut-benefit dairy foods and beverages in Ireland were considered low in value terms, in comparison to other European countries, Mintel (2005) reported that gut-benefit dairy foods and beverages experienced strong growth in Ireland in 2004. Specifically, Mintel (2005) and O' Leary (2005) reported that the natural health segment, which comprised natural, bio, organic and probiotic yoghurts, outperformed all other segments within the Irish yoghurt and yoghurt drinks market in 2004. Mintel (2005) estimated that the natural health segment accounted for 25 per cent of the Irish yoghurt and yoghurt drinks market with a value of €39.4m in 2004. In contrast to all other functional food and beverage segments, with the exception of sports and energy drinks, Mintel (2005; 2004b) reported that penetration levels for probiotic yogurt and yogurt drinks in Ireland was highest amongst those in the 15-24 year (62%) and 25-34 (56%) year age groups.

Product development activities in the European probiotic yoghurt and yoghurt drinks market over the last 10 years have been driven by new market entrants, new flavour line extensions, differentiation on the basis of functionality, and the introduction of non-dairy probiotic beverages. Mintel (2005) and Leatherhead Food Research Association (2004b) reported that the large food multi-nationals such as Groupe Danone, Muller and Yakult Honsha dominated the European probiotic dairy food and beverages market. Recently however, in response to continued growth of the European probiotic dairy market, Ocean Spray entered the European market with *Ocean Spray Cranberry* probiotic drink, while Nestle reintroduced its underperforming probiotic yoghurt and yoghurt drink brand *LC1* in selected markets (Ball, 2004; Marketing Week UK, 2003). Overall, Dairy Industries International (2005a) and Dairy Foods (2004b) maintained that NPD activities within the European probiotic drinks market

[31] Prebiotic ingredients may be defined as: "*nondigestible food ingredients that beneficially affect the host by selectively stimulating the growth and/or activity of a limited number of bacteria in the colon*" (Gibson and Roberfroid, 1995).

focused primarily on new flavour line extensions such as Ocean Spray's *Cranberry* probiotic drink, and Groupe Danone's *Actimel* orange and multi-fruit range of probiotic dairy drinks.

Foote (2002) considered Japan's fad-driven culture an ideal test market for beverage innovations given that many recent beverage trends such as probiotic drinks, energy and stimulant drinks, and ready-to-drink green tea and coffee were initially successful in Japan. In that context, Leatherhead Food Research Association (2001b) predicted a growing NPD trend towards multi-functional probiotic beverages that offered multiple benefits based upon past product launches in Japan. More recently, Leatherhead Food Research Association (2004b) confirmed that probiotic beverage manufacturers were beginning to place a greater emphasis on differentiation, in terms of functionality, particularly in established and mature markets such as Japan, Spain, Germany and France. Specifically, Mintel (2005) and Leatherhead Food Research Association (2004b; 2001b) alluded to a growing trend towards dairy yoghurts and dairy drinks that offered multi-functional health benefits such as Yoplait's *Everybody*, Yofres's *Puleva Omega 3 con Bifidus Activo*, and Pascual's *MasVital Alimento Prebiotico* drink. An increase in the number of synbiotic[32] new product launches such as Muller's *ProCult*, and Ganaderia Priegola's *Priegola Simbiotic* drink was also reported (Leatherhead Food Research Association, 2004b; Rogers, 2004a). Dairy Industries International (2005b), Leatherhead Food Research Association (2004b) and Rogers (2004b) also alluded to an increased number of non-dairy, soy or fruit juice-based, probiotic drinks on the Europe probiotic market such as Skane's *ProViva Shots* and Rauch's *Bravo Frutte e Fibre*. In particular, Leatherhead Food Research Association (2004b; 2001b) argued that fruit juice-based probiotic drinks would become an increasingly important category for beverage firms.

6.5 The Global Juice Market

According to Retail Intelligence (2002), there has been a noticeable shift away from carbonated soft drinks towards a range of still beverages and fruit juice over the last 20 years. Datamonitor (2004c) estimated that global value sales of fruit and vegetable

[32] Synbiotics may be defined as "*a mixture of probiotic and prebiotic ingredients that beneficially affect the host by improving the survival and implantation of live microbial dietary supplements in the gastrointestinal tract, by selectively stimulating the growth and/or activating the metabolism of one or a limited number of health-promoting bacteria, and thus improving host welfare*" (Reedy and Thane, 1997).

juice grew by 26 per cent between 1999 and 2003 to reach US$91bn in 2003. Datamonitor (2004d) reported that the US represented the most important market for fruit and vegetable juice in terms of both value sales and market growth. Specifically, the US fruit and vegetable juice market grew by approximately 31 per cent, in value terms, between 1999 and 2003, and accounted for approximately 32 per cent of global value sales or US$29.5bn in 2003 (Datamonitor, 2004d). According to Datamonitor (2004c), fruit juice dominated the global fruit and vegetable juice market in 2003, and pure fruit juice[33] and juice drinks[34] accounted for 42 per cent and 28 per cent of total value sales of fruit and vegetable juice respectively in that year.

Datamonitor (2004c) stated that Europe represented the second most important market for global fruit and vegetable juice sales, and accounted for approximately 20.5 per cent of total value sales in 2003. Indeed, Datamonitor (2004e) estimated that value sales of fruit and vegetable juice in Europe grew by approximately 20 per cent between 1999 and 2003 to reach US$18.7bn in 2003. Germany, the UK and Italy represented the three most important markets for fruit and vegetable juice in Europe and accounted for 24 per cent, 13.7 per cent and 13 per cent of European value sales of fruit and vegetable juices in 2003 respectively. Pure fruit juice accounted for approximately 46 per cent of value sales of fruit and vegetable juices in Europe in 2003. Furthermore, it appeared that Europe, with specific reference to Southern Europe, remained the most important market for fruit nectar[35]. Specifically, fruit nectar represented the second most important juice segment in Europe with a 33 per cent market share by value in 2003 (Datamonitor, 2004e). According to Datamonitor (2004f), Germany had the lowest compound annual growth rate (CAGR) (1.7%) for fruit and vegetable juice in Europe in 2003. Subsequently, value sales of fruit and vegetable juices in Germany grew by only 6.9 per cent between 1999 and 2003 to reach US$4.48bn in 2003, with 53 per cent of value sales accounted for by pure fruit juice in 2003 (Datamonitor, 2004f).

In contrast, the UK fruit and vegetable juice market experienced considerable growth in the last 10 years, in line with consumption trends globally. Volume sales of fruit

[33] Pure fruit juice is also referred to as '100 per cent fruit juice' in the literature. Pure fruit juice, either ambient or chilled, is produced either by squeezing juice direct from the fruit or by the addition of concentrate back to its original strength (Mintel, 1998).
[34] Juice drinks are made from a combination of concentrated pure fruit juice, water, flavourings and additives (Consumer Goods UK, 2000).
[35] Fruit nectar is a combination of pure fruit juice and water with the addition of sugar, honey or sweeteners (Food Standards Agency, 2003).

juice grew by over 35 per cent to 1.6bn litres between 1995 and 1999, and the UK pure fruit juice market was valued at stg£1.03bn or 64 per cent (by value) of the total fruit and vegetable juice market in 1999 (Consumer Goods UK, 2000). Consumer Goods UK (2000) attributed the dynamic growth of the UK fruit juice market to market and product development activities in the chilled cabinet. Specifically, this referred to the development of the freshly squeezed[36] and 'not from concentrate[37]' categories, and increased activities in the juice drink sector (Consumer Goods UK, 2000). More recently, Datamonitor (2004g) reported that the UK fruit and vegetable juice market grew by 4.5 per cent in 2003 to reach a value of US$2.56bn, and pure fruit juice maintained its market share at 65 per cent of total value sales of fruit and vegetable juice in the UK in 2003.

6.5.1 The Irish Fruit Juice Market

The fruit juice market in Ireland has grown strongly in recent years, both in terms of volume and value sales (Checkout, 2004a). According to Datamonitor (2004h), the Irish fruit juice market was valued at approximately €120m in 2003, where orange juice accounted for 70 per cent of value sales in that year. Volume sales of fruit juice in Ireland increased by 17 per cent to 75m litres between 2002 and 2003, and the pure fruit juice sector accounted for 75 per cent of volume sales in Ireland in 2003 (Datamonitor, 2004h). Seymour-Cooke (2001) remarked that the Irish fruit juice market was traditionally similar to that of the UK in terms of the market share of 'made from concentrate[38]', 'not from concentrate' and freshly squeezed juice. However, unlike the Irish fruit juice market, private label brands dominated the chilled juice category in the UK (Consumer Goods UK, 2000). In contrast, Seymour-Cooke (2001) noted that Irish customers were considered to retain a strong brand loyalty in terms of purchase preferences for fruit juice, and Checkout (2004a) observed that PepsiCo's *Tropicana*, Kerry Group's *Dawn* and Batchelor's *Sqeez* ranges accounted for approximately 51 per cent of total fruit juice sales in Ireland in 2003. Retail News (2002) maintained that segmentation was the key to further growth in the global fruit

[36] Freshly squeezed juice may be defined as: "*100 per cent pure squeezed juice with no additives, commonly unpasteurised and chilled*" (Consumer Goods UK, 2000).
[37] Juice 'not from concentrate' may be defined as: "*100 per cent pure juice containing no added water, sugar, colour or preservatives. The juice is squeezed and then gently pasteurised*" (Mintel, 1998).
[38] Juice 'made from concentrate' may be defined as: "*100 per cent pure juice reconstituted from concentrate. The natural water content of the juice is evaporated prior to transportation and the concentrate frozen. Water is re-added and the juice is thermally processed at the local factory. The juices produced in this way can be long life or chilled, depending on the intensity of the thermal process*" (Mintel, 1998).

juice market. Retail Intelligence (2002) claimed that the growth in fruit juice sales globally was primarily driven by growth in the chilled pure fruit juice segment.

While ambient or long life pure fruit juice continued to dominate the Irish fruit juice market with 45 per cent of value sales, chilled pure fruit juice and juice drinks accounted for 40 and 15 per cent of total value sales of fruit juice respectively in Ireland in 2003 (Euromonitor, 2004). Chilled pure fruit juices could be further segmented into 'made from concentrate' (52%) 'not from concentrate' (42%), and freshly squeezed pure fruit juice with six per cent of value sales in 2003 (Euromonitor, 2004). PepsiCo pioneered the market development of 'not from concentrate' juices through its flagship brand *Tropicana* (Mintel, 1998). Chilled juice 'not from concentrate' continued to perform strongly in 2003 and realised a 10 per cent growth in its share of the chilled juice market in Ireland (Checkout, 2004b). PepsiCo's *Tropicana* now accounts for approximately 41.5 per cent of the chilled fruit juice market, while the Kerry Groups's *Dawn* brand holds a further 25 per cent brand share in the chilled fruit juice market in Ireland (Checkout, 2004b).

6.6 Market Trends and Key Growth Drivers of the Global Fruit Juice Market

The key drivers of the global fruit juice market in the last 10 years have been: changes in customers' preferences towards new juice types and varieties (Zenith International, 2001); increased customer demand for juice drink blends that combined a range of exotic fruits (Hilliam, 2001); the impressive growth in chilled juice sales; the development of new juice-based drinks for children (Beverage Industry, 2000); and functional juices (Leatherhead Food Research Association, 2003a). Leatherhead Food Research Association (2001a) and Zenith International (2000) originally reported that growth in the global juice market was attributed to increased customer demand for juice drinks, which was reflected in high levels of NPD activity. However, Leatherhead Food Research Association (2003a) argued that growth in the juice drink category had stabilised as customers' purchase preferences, and those of parents in particular, reverted back to pure fruit juice, which was perceived as more natural and more nutritious.

Kleinman (2003) reported that volume sales of Procter and Gamble's *Sunny D* had indeed dropped by 46 per cent from 157m to 85m litres in the UK between 2000 and

2003, and its share of the UK juice drink market decreased from 22 per cent to 10 per cent over the same period. Kleinman (2003) attributed the decline in volume sales of *Sunny D* to a loss of competitiveness to beverages perceived to be healthier such as *Ribena*, *Ocean Spray*, *Tropicana*, and smoothies. However, Leatherhead Food Research Association (2004b) reported that juice drink manufacturers were repositioning their existing juice drinks on a healthy platform, through an increase in the juice content as well as the addition of functional ingredients. For example, Procter and Gamble increased the juice content of *Sunny D* from 5 to 15 per cent to sustain a competitive advantage and appeal to more health conscious customers and parents (Kleinman, 2003). Furthermore, Gerry (1997) argued that juice manufacturers attempted to halt a further decline in juice drink sales through greater attention to innovation, particularly as customers' preferences changed towards pure fruit juice and juice drink blends that combined traditional and exotic juices. Indeed, Leatherhead Food Research Association (2003a) and Zenith International (2001) reported that the majority of flavour innovations in Europe were as a consequence of the increased availability of functional juices made from blends of orange juice with exotic fruits such as mango, papaya or guava.

According to Retail News (2002), concentration and competition increased in the one-litre fruit juice sector in the last 10 years. Beverage Industry (1999a) and Theodore (1998) had earlier predicted that volume sales of ambient 'made from concentrate' juice were set to decline, although Centaur (2005) more recently remarked that the predicted decline in sales across the ambient juice category was offset by impressive growth in both volume and value sales of ambient stored cranberry juice. Not withstanding this, Centaur (2005) and Retail Intelligence (2002) reiterated that the chilled juice category remained the most important driver in the global fruit juice and juice drink market. Leatherhead Food Research Association (2001a) reported that chilled juices had become a key growth sector over the last 15 years, where high added value chilled juices gained an increased share of the fruit juice market in both the US and Europe. For example, chilled fruit juices realised a 222 per cent increase in volume sales between 1998 and 2000 and accounted for 48 per cent of total volume sales of fruit juice in the US in 2000 (Leatherhead Food Research Association, 2001a). Indeed, ACNielsen (2003) found that chilled orange juice had achieved a household

penetration rate that was 30 per cent higher than both ambient or long life, and frozen orange juice in the US in 2003.

Hartnett (2000) had earlier reported on a growing trend towards high fruit content fruit juice and juice drinks as customers moved away from traditional value or price sensitive categories towards chilled and premium juice. More recently, Centaur (2005) and Roskelly (2002) confirmed increased NPD activity towards premium chilled freshly squeezed juice such as Minute Maid's *Simply Orange*. A further indication of growing customer demand for premium chilled juice relates to the dramatic increase in the number of juice and smoothie bars (Mintel, 2004b). Indeed, Kochak (1998) originally reported that smoothies were becoming increasingly important in terms of their presence in the chilled category. In particular, the interest that juice manufacturers have shown in smoothies has grown in tandem with the growing trend towards convenience and the consumption of meals-on-the-go (Leatherhead Food Research Association, 2003b). As Perlik (2004: 33) noted: "*people tend to skip breakfast because they don't like traditional breakfast foods and they don't have time to prepare them. They're used to drinking juice, but they want more of a meal replacement*". For example, Croft (2005) and Beverage Industry (2001b) reported that Tropicana launched a range of yoghurt and fruit juice smoothies in the US in response to the growing trend towards on-the-go beverage consumptions. More so, PepsiCo purchased PJ Smoothies, the leading smoothie brand in UK, in 2004 in order to consolidate its dominant presence in the UK smoothie and premium juice market (Centaur, 2005).

Leatherhead Food Research Association (2003b) also reported that smoothies presented juice manufactures with increased NPD opportunities to target both the children's and adult's markets as market opportunities in the juice drink market waned. In particular, Gutner and Khermouch (2005) reported an increased trend towards smoothies that contained added functional ingredients. For example, Jamba Juice Bars in the US offer customers the option of the addition of stimulant ingredients such as green tea and guarana to their complete range of regular smoothies (Restaurant Business, 2005). Although smoothie and juice bars have the potential to cannibalise supermarket and forecourt store sales of premium juices, Hunter (2005) and Kelleher (2005) believe that smoothie and juice bars will result in greater customer exposure to,

and experimentation with, innovative functional drinks with novels flavours and functional ingredients. This in turn, they believe, will stimulate future growth within the mainstream functional beverages market (Hunter, 2005; Kelleher, 2005).

6.7 Product Development Trends in the Functional Fruit Juice Market

Leathers (2002) proposed that beverage manufacturers had traditionally avoided the introduction of single serve premium beverages as a consequence of customer acceptance issues at price point. However, Foote (2002) reported that NPD activities in functional and enriched fruit juices had increased over the last 10 years which was attributed to the growing trend among customers toward health, wellness and convenience. As Beverage Industry (2001b: 38) noted: "*with added value ingredients, nutraceutical pushes, products loaded with extra vitamins and minerals, new and user-friendly packaging and juices so full of 'stuff' that they offer the same satisfaction as a meal, the juice category has become as versatile as a button-down white shirt or blouse. New product concepts are not flowing at record speeds, but most juice manufacturers are looking to their traditional products and by adding a boost or new package to target multiple usage occasions and customers are filling out product lines*". Indeed, Beverage Industry (2002) and Penn (2000) believed that functional and fortified juices would drive future growth within the chilled juice sector.

Leatherhead Food Research Association (2002c) stated that the global functional juice market was traditionally dominated by calcium-fortified fruit juice, which was valued at US$760m in 2000. According to Leatherhead Food Research Association (2002c), sales of calcium-fortified juices in the US grew by 150 per cent between 1996 and 2000 to US$450m, to account for 20 per cent of total fruit juice sales in the US in 2000. This was attributed to ingredient innovations that improved the overall sensory profile of juices enriched with calcium (Butler, 2002). Indeed, volume sales of Coca-Cola's *Minute Maid* increased by 30 per cent when it followed PesiCo's *Tropicana* into the calcium-fortified juice market (Thompson, 2001; Reyes, 2000). More recently, Proctor and Gamble also repositioned its flagship juice drink *Sunny D* as a healthy alternative to carbonated soft drinks through the addition of calcium (Kleinman, 2003; Leatherhead Food Research Association, 2002d).

However, Butler (2002) and Beverage Industry (1999b) maintained that calcium fortification alone could no longer present functional juice manufacturers with a unique selling point or competitive advantage within the functional juice market. As Leathers (2002: 29) noted: "*It's getting to the point where calcium fortification is almost going to be an expectation as opposed to just an enhancement*". In that context, Butler (2002) identified a number of new product introductions launched by juice companies in the US in 2001 that included juices fortified with Vitamin D and other vitamins and minerals associated with milk. With the establishment of functional beverages in the marketplace, product differentiation on the basis of functionality has become an increasingly important element of firms' marketing strategies (Riell, 2002). More importantly, Leatherhead Food Research Association (2004b) emphasised that functional beverage manufactures had sought to further differentiate their products through effective segmentation and product positioning. For example, Frozen Food Age (2004) reported that PepsiCo's *Tropicana* had recently launched a range of functional juices, targeted at different customer lifestages, lifecycles and health concerns, under the *Healthy Essentials* sub-brand that included: *Light n' Healthy*, *Healthy Heart*, *Immune Defence*, *Low Acid*, and *Healthy Kids* range.

An important trend highlighted by Hehn (2001) related to innovations transcending beverage categories. This not only referred to manufacturers diversifying into new product categories, but also the movement of functional ingredients across and between categories. For example, Berry (2002) reported on Upstate Farm's *Mocha Java Caffeine Kick* (stimulant milk) as a better-for-you alternative to carbonated stimulant drinks. Johnson (2002) predicted that stimulant drinks could expect to face competition from drinks designed to enhance well-being. For example, AriZona Beverages launched a range of *Memory Mind Elixir* functional juices that contained green tea, gingko biloba, ginseng and vitamins (Beverage Aisle, 2002). In particular, Leatherhead Food Research Association (2004b) and King (2002) maintained that juice manufacturers would lead NPD activities for gut-benefit beverages as line extensions of existing vitamin and mineral fortified drinks. Specifically, Dairy Foods (2004c), Rogers (2004b) and Leatherhead Food Research Association (2001b) reported on the increased number of probiotic juices and juice drinks launched on markets in Northern and Western Europe such as Valio's *Gefilus*, Skane's *ProViva* (one-litre carton) and *ProViva Shots* (250ml bottle) and Hero's *Bienstar*. More

recently, Pete & Johnny launched *Its Alive*, a non-dairy fruit smoothie containing Bifido cultures (Dairy Foods, 2004b).

6.8 Summary

The global market for functional beverages is expected to maintain strong growth rates as customers become more aware of, and accustomed to, the various benefits associated with functional beverages. The literature offers much support for the importance of fruit juice as the carrier or base product for new functional ingredients in the future. It is suggested that future growth in the nutrient-enriched, probiotic and stimulant drinks markets in particular will be achieved through greater NPD activity in the functional fruit juice and juice drink category. This is based upon customers' positive perceptions of fruit juice. However, identifying which customer segments and functional benefits will sustain future growth remains a problematic area for functional beverage manufacturers. Chapter 7 presents the research methodology to this study.

PART III: RESEARCH METHODOLOGY

Chapter 7: Research Methodology

7.1 Introduction

This chapter presents the research design and methodologies employed in this study. The overall research question that guided this study was: *To what extent can the effective knowledge management process assist firms exploit market opportunities for functional beverages in Ireland*? The main research question was broken down into 3 specific sub-questions:

Sub-question 1: *What are customers' expectations, requirements and preferences for functional beverages?*

Sub-question 2: *What functional beverages appeal to specific market segments?*

Sub-question 3: *Can advanced concept optimisation research methodologies contribute towards effective strategic marketing decisions for functional beverages in Ireland?*

NPD is a knowledge intensive process where the generation of new ideas and concepts requires detailed knowledge of both products and customers. In particular, the early or concept stage of the NPD process represents an extremely important stage for managing knowledge of both internal technological capabilities and external measures of customers' needs. The research design strategy employed in this study approached knowledge management in NPD through the use of advanced concept optimisation research methodologies at the early or concept stage of the new product process. A sequential exploratory research design strategy through a combination of research methods was chosen for this study. A qualitative research approach using in-depth interviews and focus groups was initially chosen to identify the most important product design attributes driving customers' preferences for orange juice and soft drinks, and to gain insights into customers' attitudes and preferences for functional beverages. A quantitative research approach using conjoint analysis was then chosen

to quantify customers' attitudes and preferences for specific functional beverage concepts, to identify viable market segments for new functional beverages, and to examine trade-offs which customers would be expected to make between key product design attributes, in a market-oriented fashion.

7.2 Research Design Strategy

Kumar (1996) stated that a research design strategy outlined the process by which research would be conducted, the measurement procedures and sampling strategy employed, and the method of analysis used by the researcher. Kerlinger (1986: 279) defined a research design as "*a plan, structure, and strategy of investigation so conceived as to obtain answers to research questions and problems*". Therefore, Kumar (1996: 16) maintained that the main purpose of the research design was "*to describe and explain the methodological process through which the research question guiding a study was answered*". Marshall and Rossman (1999) and Kumar (1996) agreed that the selection of the most appropriate research design was necessary to enable the researcher to arrive at valid findings and conclusions. More so, Mason (1996) reiterated that the key task during the research design stage was not only to decide upon the most appropriate research methods and data sources, but also to understand both the methodological implications of choosing distinct methodological techniques, and the links between the research questions and the research methods chosen. Kumar (1996) also highlighted the importance of secondary research to the construction of a suitable methodological framework within the context of the research study design. In particular, Mason (1996) stated that the research design should be based upon a combination of theoretical claims and empirical evidence to produce an argument that would answer the research question guiding the study. Therefore, an important task within the overall research design strategy is the gathering and review of secondary information.

According to Creswell (2003) the purpose of secondary research is to share with the reader the results of other published studies that are closely related to the study under investigation. Marshall and Rossman (1999) and Miller (1991) report that secondary research provides a framework for establishing the importance of a study as well as a benchmark for comparing the results of a study with other published findings. Secondary research data collection methods were initially identified and sourced, and

a literature review of the most salient issues on NPD, market orientation and knowledge management, and functional foods and beverages was conducted. The first two chapters of the literature review, Chapters 3 and 4, were conceptual in nature, and secondary information on NPD success factors, market orientation and knowledge management were primarily sourced online from a number of publishing house databases such as Blackwell Synergy, Emerald, Science Direct, and Wiley Interscience. Also, pertinent books, official government publications, and agri-business discussion papers that related to NPD, market orientation and knowledge management were sourced from both the Boole Library and the Department of Food Business and Development at University College Cork, and the Trinity College Dublin Library.

The final two chapters of the literature review, Chapters 5 and 6, were contextual in nature, and academic journal articles and trade journals on key functional trends, new functional product launches, market dynamics and the strategic marketing of functional foods and beverages were primarily sourced online from the Business Source Premier database. Furthermore, a number of timely food and nutrition reports published by the World Health Organisation and the European Union, as well as market research reports published by Datamonitor, Leatherhead Food Research Association, Mintel International, Reuters Business Insight and Zenith International were sourced through the World Wide Web and the Trinity College Dublin Library.

The research presented in this dissertation was undertaken as part of a multi-disciplinary NPD project. The multi-disciplinary NPD research group was comprised of of academic staff and postgraduate students from the Departments of Food and Nutritional Sciences, Food Business and Development, Microbiology, and Process and Chemical Engineering, UCC, Ireland. The overall aim of this multi-disciplinary NPD project was the development of customer-led functional beverages with high intellectual property value through innovations in product formulation and process design.

The research design strategy was chosen following the identification of the research question and sub-questions that guided this study, and a review of the relevant literature on NPD, market orientation and knowledge management, and functional

foods and beverages. This process involved an evaluation of alternative research methods, sampling plans and methods of analysis, which were linked to the overall research question that guided the study, as outlined by Kumar (1996). A mixed methods research instrument was chosen for this study in order to qualitatively explore, and then quantitatively measure, customers' attitudes and preferences for a range of functional beverages. According to Wolcott (2001), a mixed methods research instrument recognised that all research methods had limitations, and that the biases inherent in any single methodology could neutralise or cancel the biases of other research methods. In particular, Greene *et al*. (1989) believed that the results from one research method could help develop or inform another method. According to Creswell (2003), a research design strategy that used mixed research methods involved the collection of data either simultaneously or sequentially in order to best understand the research problem under investigation. A sequential exploratory research design strategy, using a combination of research methods, conducted concurrently to the research endeavours of the R&D personnel involved in the project, was chosen for this study, where the quantitative data and results assisted in the interpretation of the qualitative findings (Hakim, 1987) (See Figure 7.2.1). In particular, Morgan (1998) suggested that a sequential exploratory research design strategy was most appropriate to test an emergent theory that resulted from both secondary and qualitative primary research. In particular, Leedy (1997) stated that initial qualitative research enquiries meant a flexible and adaptable research design during the early stages of the research process.

The research instrument used in this study consisted of a combination of in-depth interviews, focus groups and conjoint analysis. The qualitative or explorative element to this research investigated customers' choice motives for orange juice and soft drinks, and explored their attitudes and perceptions towards a range of new functional beverage concepts, through a combination of 15 in-depth interviews and 3 focus groups. The qualitative research generated a wealth of information, which was then used to quantitatively investigate customers' preferences for chilled nutrient-enriched and probiotic orange juices, and stimulant soft drinks. The quantitative or segmentation element to this research consisted of 3 conjoint-based questionnaires administered to 1200 customers, that is, 400 different customers for each study, which determined the most important extrinsic and intrinsic product design attributes that

influenced customers' purchase preferences for chilled nutrient-enriched and probiotic orange juices, and stimulant soft drinks, and for the purpose of benefit segmentation.

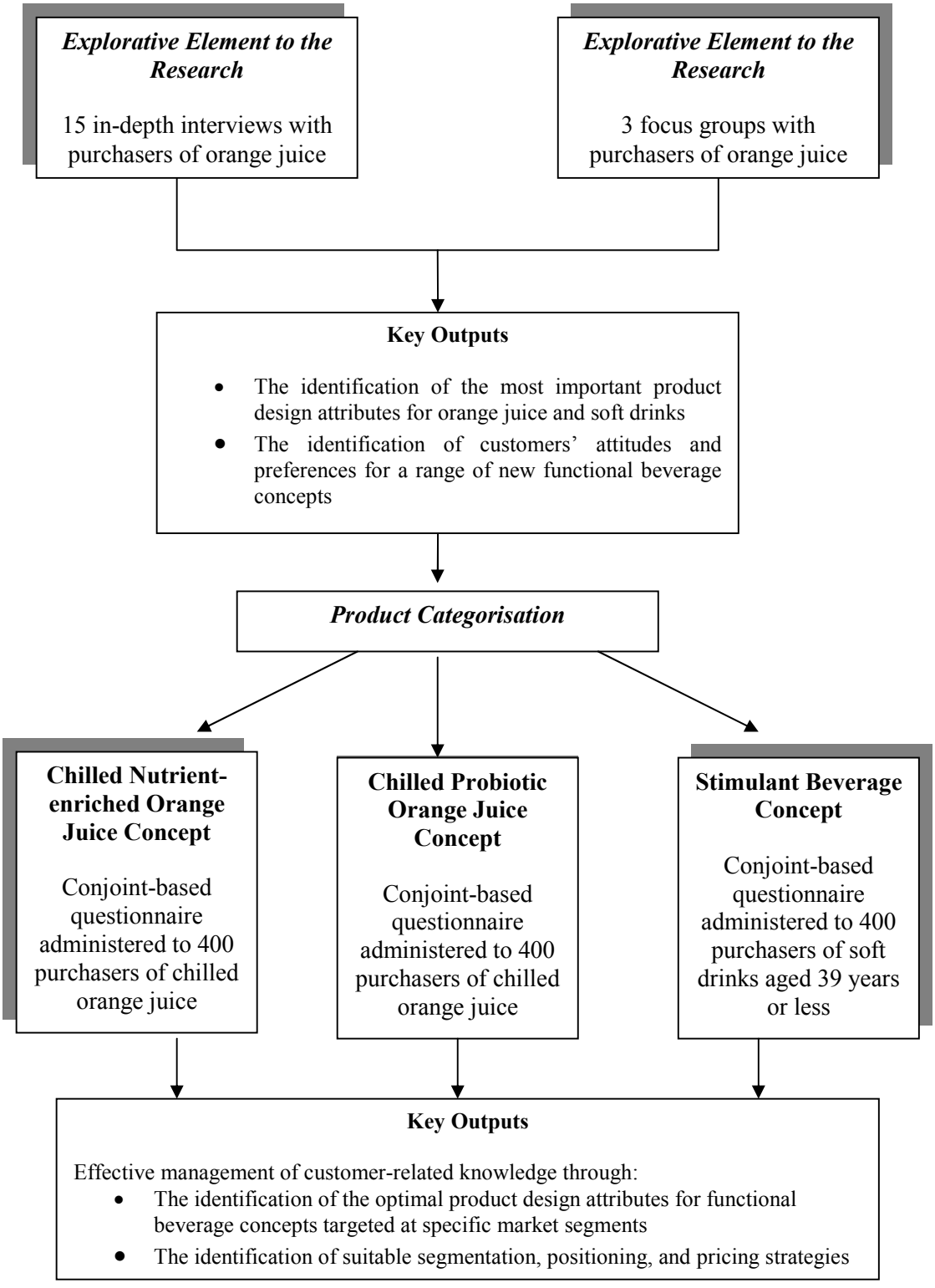


Figure 7.2.1 The Research Design Strategy

7.3 Mixed Methods Research Instrument

Denzin (1989) stated that a mixed methods research design involved the use of multiple data sources to check the integrity of the inferences drawn from conclusions from more than one methodological perspective. Hall and Hall (1998) argued that a mixed methods research design was particularly used where researchers felt that the weakness of one method could be balanced by the strength of another research method. In particular, Marshall and Rossman (1999) maintained that combined qualitative and quantitative research methods provided for in-depth analysis and rich detailed explanation of results. More so, Denzin and Lincoln (1994) believed that a mixed methods research design provided for a more holistic view of the context under study than using a single methodology. In that sense, Arksey and Knight (1999) and Miles and Huberman (1994) stated that a mixed methods research instrument made it possible to approach research problems from different methodological perspectives, and brought together a range of views that could generate new and alternative explanations on the topic under investigation. In this research a series of in-depth interviews and focus groups were conducted to identify the most important design attributes that influenced customers' preferences for orange juice and soft drinks, and explored customers' attitudes and perceptions towards functional beverages. Following this, three quantitative conjoint-based surveys were administered to model and predict customers' purchase preferences for a range of functional beverages, in a market-oriented fashion.

However, Bryman (1992) stressed that the combination of qualitative and quantitative research for the purpose of triangulation was a problematic issue for many researchers where differences in findings arose. However, Ritchie and Lewis (2004) state that researchers should not expect evidence from different research methods to replicate each other. Although it was assumed that conclusions could more accurately be drawn from data from different sources, Mason (1996) argued that complementarity as well as convergence in data findings was equally valid in mixed methods research design strategies. Hammersley and Atkinson (1983: 200) stated that: "*differences between sets or types of data may be just as important and illuminating. What is involved is not just a matter of checking whether inferences are valid, but of discovering which inferences are invalid*". More so, Arksey and Knight (1999) argued that divergent results could be equally fertile areas for theory building, policy and practice.

Silverman (1993) stressed that the goal of a mixed methods research design was not solely to reveal differences and similarities in findings from different methodological perspectives, but also to understand, account for and explain similarities and differences in research findings. Mason (1996) agreed that a mixed methods research design encouraged researchers to approach their research questions from different methodological perspectives, in order to explore their research questions in a 'rounded and multifaceted way'. In that sense, Ritchie and Lewis (2004) believed that the value of a mixed methods research instrument, in terms of research design, lay in extending the researcher's understanding of particular phenomena or through 'adding breadth or depth of analysis'.

7.4 Qualitative Research Methods

Cresswell (1998: 15) characterised qualitative research in terms of a collection of methodological techniques that "*build a complex, holistic picture that reports detailed views of informants in a natural setting*". Hall and Hall (1998) argued that qualitative research methods were more 'humanist' in nature where respondents' voices were more clearly heard than in data generated through quantitative research methods. That is, qualitative research generated data and finding that was not derived from statistical procedures (Strauss and Corbin, 1998). In that context, Creswell (2003) stressed that qualitative enquiries were fundamentally interpretive in nature where a researcher described individuals or settings, analysed data from themes or categories, and finally drew personal or theoretical interpretations and conclusions. Furthermore, Marshall and Rossman (1999) characterised qualitative research as emergent rather than tightly figured in nature. According to Lofland and Lofland (1995) and Taylor and Bogdon (1984) qualitative research also facilitated an emergent research design that was flexible in the early stages of the research process, adaptable, allowed for and could anticipate changes in strategies, procedures or questions asked, and where the researcher remained attuned and responsive to the circumstances of a particular study. This again suggested that qualitative enquiries were less linear and more circular in nature (Mason, 1996).

In particular, Silverman (2000) and Rossman and Rallis (1998) considered qualitative methods more effective than quantitative techniques where the principal objective of the research was to explore peoples' life experiences and everyday behaviours. For

example, Gubrium (1988) noted that quantitative techniques could equally conceal as well as reveal basic social processes. Gubrium (1988) therefore believed that qualitative enquiries provided a deeper understanding of social phenomena than would be derived from purely quantitative analysis. Specifically, Arksey and Knight (1999) and Walker (1995) explained that qualitative research aimed to explore informants' perspectives, attitudes, beliefs and perceptions through close and intimate contact with informants. From a methodological perspective, Flick (1998) maintained that qualitative research helped build theory through the discovery of new concepts and relationships. According to Mason (1996), the most frequently used qualitative research methods in the social sciences and marketing domains included: ethnography, in-depth one-to-one interviews and focus groups.

McDaniels and Gates (1991) stated that qualitative methods, and in-depth interviews in particular, facilitated the use of open-ended questions that generated rich data on life experiences and revealed a wealth of information on informants. As Hill (1993: 258) commented: "*living through the highs and lows of informants allows the researcher to know the phenomenon under investigation in a way that few other methodologies permit*". In particular, Chisnall (1991) had earlier stated that in-depth interviews sought to discover the reasons that accounted for respondents' behaviours. In addition, Stewart and Shandasani (1990) proposed that in-depth interviews generated rich data from customers that helped explore the rationale for choice motives and longitudinal acts. In that sense, Kiener (1995) maintained that quantitative research methods lost validity when applied to hypothetical situations such as future potential shopping behaviours. Consequently, Kiener (1995) felt that emerging behaviour patterns could be more easily recognised better and earlier through qualitative research methods. Indeed, Krueger and Casey (2000) stated that qualitative research, and in-depth interviews in particular, provided insights into multifaceted behaviours, attitudes and motivations of respondents. Bauer and Gaskell (2000) maintained that in-depth interviews would yield more information regarding an individual's personal experiences, decisions, action sequences, and choices than focus groups. More importantly, Creswell (2003) argued that in-depth interviews could be used more effectively than focus groups to understand complex reasoning that was multifaceted and iterative in nature. As Gilmore and Carson (1996: 21) noted: "*interview techniques are highly appropriate for marketing research given the*

dynamic nature of industry". That is, examinations of complex and dynamic situations could be more effectively achieved through in-depth interviews due to its open, flexible and experimental approach.

One-to-one interviews provide in-depth information about a single individual, which results in a comprehensive view of the issue under investigation (Bauer and Gaskell, 2000). Krueger and Casey (2000) also proposed that in-depth interviews provided a more appropriate setting than focus groups in which to assess an individual's knowledge of content. However, Duncan and Marotz-Baden (1999) and Morgan (1997) believed that focus groups were most beneficial in eliciting insights from combined local perspectives. In that sense, Krueger and Casey (2000) considered focus groups to be naturalistic, which would ultimately lead to important insights into group human behaviours. Krueger (1994: 6) defined the focus group methodology as "*a carefully planned discussion designed to obtain perceptions on a defined area of interest in a permissive and non-threatening environment*". Barbour and Kitzinger (1999) reiterated that the focus group method naturally encouraged interactions and comments on individuals' personal experiences and points of view. Both Flick (1998) and Morgan (1998) agreed that the key strength of the focus group methodology lay in the use of group interactions to generate insights into attitudes and beliefs that were less accessible without interaction effects.

In particular, Schindler (1992) considered focus groups a unique source of information about how customers would respond in a situation where there would be an awareness of the views of other customers. Specifically, Flick (1998) considered focus groups more beneficial than in-depth one-to-one interviews because of their unique ability to analyse customers' attitudes and opinions in a social context, where subgroups could emerge to challenge each other's views and opinions. In fact, May (1993: 95) noted that: "*as most of our lives are spent interacting with others, it comes as no surprise that our actions and opinions are modified according to the social situation in which we find ourselves*". In that context, Fitzpatrick (1997) considered focus groups particularly appropriate for concept testing and concept refinement within the NPD process as it enabled product developers gain direct contact with potential users of products. In particular, Fitzpatrick (1997) added that focus groups were especially valuable to product developers where customers' needs were poorly understood, and

where group discussions provided concentrated, well-defined and pre-filtered data. More recently, McDonagh-Philip and Bruseberg (2000) affirmed that focus groups were particularly essential at the early stages of the NPD process for concept development, where an understanding of customers' needs was essential before 'fixed ideas' to innovation problems became established, and for 'fast-tracking' the NPD process.

7.4.1 Semi-structured In-depth Interview and Focus Group Guides

Hall and Hall (1998) stated that the purpose of an in-depth interview or focus group guide was to translate the aims and objectives of the research into topics or questions for further exploration. Leedy (1997) described two types of interview or focus group guides that could be used in qualitative research: structured and semi-structured interview schedule guides. According to Tull and Hawkins (1987), structured interview and focus group guides restricted the researcher to specific questions and instructions for investigation. In contrast, Robson (1995) argued that semi-structured interview and focus group guides contained clearly defined objectives and purposes yet allowed flexibility in the discussion and ordering of research topics and questions. As Gilbert (1993: 136) noted: "*major questions are asked the same way each time, but the researcher is free to alter the sequence and to probe for more information*". The semi-structured in-depth interview and focus group guides were developed in accordance with established practice (Krueger, 1998) (See Appendices 1 and 2 respectively).

The in-depth interview and focus group guides generally covered four main research themes: individual and household consumption of fruit juice and orange juice; customers' attitudes towards functional juices presently on the market; attitudes and perceptions towards a range of hypothetical functional beverage concepts; and customers' attitudes towards novel processing techniques. The in-depth interview and focus group guides differed with respect to questions concerning the purchase decision-making process for orange juice. Specifically, the key extrinsic and intrinsic orange juice attributes were only investigated through, and discussed within, the in-depth customer interviews (See Appendices 1 and 2). A pilot focus group and pilot in-depth interview were conducted to ensure that the questions asked were coherent,

easily interpreted, and answerable by participants, in line with best practice (Stewart and Shamdasani, 1990).

7.4.2 Data Collection

Kumar (1996) and Walker (1995) defined sampling as the process of selecting a number of informants from a larger population to form the basis for estimating and predicting characteristics regarding the larger population. Gilbert (1993) reported that the basic distinction in sampling methods was between probability sampling and non-probability sampling. Leedy (1997) defined probability sampling as the representation of all segments of a population in a sample. In contrast, Leedy (1997) stated that no pretence could be made regarding a sample's representativeness when researchers employed non-probability sampling techniques. Stewart and Shamdasani (1990) noted that non-probability sampling techniques, and convenience sampling in particular, were most commonly used for recruiting participants in explorative studies. As Denzin and Lincoln (1994: 202) remarked: "*many qualitative researchers employ convenience or purposive, and not random, sampling methods. They seek out groups, settings and individuals where the processes being studied are most likely to occur*". In this study, interviewees and focus group participants were recruited by means of a non-probability sampling method, using a combination of purposive and convenience sampling (Fink and Kosecoff, 1998). Marshall and Rossman (1999) stated that purposive sampling involved the selection of respondents that possessed some feature or characteristic of interest to the researcher. However, Denzin and Lincoln (1994) warned that purposive sampling demanded a critical evaluation of the parameters of the population of interest, and the careful selection of the sample population on that basis.

Interviewees and focus group participants were selected based on a positive response to a screening question related to their purchase behaviour towards orange juice. The question was: "*Do you purchase orange juice at least once every two weeks*"? Consequently, fifteen interviewees and twenty-three focus group participants, of both genders from a range of age groups and socio-economic backgrounds, were recruited to participate in fifteen in-depth interviews and three focus groups respectively between February and March 2003. The in-depth interviews were conducted at a suitable location in University College Cork, Ireland. Two focus groups were

conducted in Cork City, within University College Cork, and at a self-catering retirement home. A third focus group was conducted at a central location in Limerick City. Before each interview and focus group, participants answered a short questionnaire, which was administered to augment the information generated from the qualitative discussions (See Appendix 3). This researcher, an experienced moderator, conducted the focus groups and in-depth interviews, which were audiotape recorded and lasted approximately ninety minutes. A number of in-depth interviews and focus groups were also videotaped. During the interview and focus group discussions, product prompts and information displayed on a flipchart were introduced as visual stimuli to aid discussions and to gather constructive feedback. All interviewees and focus group participants were rewarded with a gift of €40 for their time and effort in line with best practise (Kreuger, 1994).

7.4.3 Data Analysis

The qualitative data generated from both the in-depth interviews and focus groups was transcribed from the audiotape recordings and analysed using the computer package N6™ (QSR International, 2002). Hall and Hall (1998) stated that computer software programs provided an efficient means of managing, storing, and coding qualitative transcript data for further analysis. As Silverman (2000: 186) stated: "*the goal in developing a complex cataloguing and retrieval system is to retain good access to the words of subjects, without relying upon the memory of interviewers or data analysts*". Silverman (2000) argued that computer-assisted analysis of qualitative data delivered a number of benefits over traditional content analysis such as: the ability to explore more numerous analytic questions; improvement of rigour; facilitation of team research; and the development of consistent coding schemes. The transcriptions were indexed through the creation of a node tree that represented the ideas, thoughts and perceptions expressed by interviewees and focus group participants. The in-depth interview and focus group transcriptions were then coded using the computer package N6™ (QSR International, 2002). The N6™ software package facilitated the process of identifying, coding and retrieving information for further analysis (See Appendix 4). Finally, the questionnaires administered at the beginning of each in-depth interview and focus group were analysed using SPSS v11 (SPSS, 2003), and supplemented the information generated through the qualitative discussions.

7.4.4 Validity and Reliability of Qualitative Research

Although Hammersley (1990) acknowledged the difficulties presented in validating qualitative research findings, it was argued that the validity[39] and reliability[40] of qualitative enquiries could be assessed based on one or more of the following criteria: plausibility; credibility; and evidence for validity from previous research. From an operational perspective, Creswell (2003) outlined a number of strategies that researchers could adopt to enhance the validity and reliability of qualitative research that included: prolonged observation of data; peer debriefing; a mixed methods research instrument; and member checking or an external auditor to determine the accuracy of qualitative findings. In this study the validity and reliability of the qualitative data was primarily achieved through a combination of: prolonged observation of raw data through the development of hierarchical node trees using the computer package N6™; peer debriefing and discussions with the technical R&D personnel involved in the project; a mixed methods research instrument using a sequential combination of in-depth interviews, focus groups and conjoint analysis to achieve complementarity in research methods; and pilot-testing of the in-depth interview and focus group guides. Robson (1995: 404) had earlier argued that plausibility and credibility in qualitative enquiries could be achieved, and validity therefore enhanced, through a combination of prolonged and persistent observation of data, and peer debriefing: "*exposing one's analysis and conclusions to a colleague or other peer on a continuous basis can assist in the development of both the design and analysis of the study, and fosters credibility*".

In particular, Denzin and Lincoln (1994) stated that computer-assisted analysis of qualitative data made it possible for researchers to perform a rigorous analysis of the data, which enhanced the validity of qualitative research findings. In that instance, Sliverman (2000) argued that qualitative analysis fitted the conventional criteria of validity and reliability, as computer-assisted analysis of qualitative data increased the researcher's confidence that the patterns or behaviours reported actually existed throughout the data. Hall and Hall (1998) and Miles and Huberman (1994) considered a mixed methods research instrument an important approach to fostering credibility in

[39] Validity refers to the extent to which an account accurately represents the social phenomena to which it refers (Hammersley, 1990).
[40] Reliability refers to the degree of consistency with which instances are assigned to the same category by different observers or by the same observer on different occasions (Hammersley, 1990).

qualitative research. In particular, Creswell (2003) stated that triangulation of data from different sources could be used to build a coherent justification for emerging themes from qualitative research, and consequently, argued that triangulation strengthened the reliability of qualitative enquiries. Finally, Silverman (1993) stressed that it was critically important to pre-test in-depth interview and focus group guides in order to enhance the validity and reliability of qualitative research findings.

7.5 Conjoint Analysis

Louviere (1988) described conjoint analysis as a group of techniques based on the models of information integration and functional measurement that gave an insight into the composition of customers' preferences. Farber and Griner (2000: 63) defined conjoint analysis as: "*any decompositional method that estimates the structure of customers' preferences given his or her overall evaluations of a set of alternatives that are pre-specified in terms of levels of different attributes*". Carson *et al*. (1994) therefore categorised conjoint analysis as a multivariate technique that modelled the purchase decision-making process though an analysis of customer trade-offs among hypothetical multi-attribute products. The American Marketing Association (1992) maintained that in conjoint analysis a product could be described as a combination of a set of attribute levels, which were believed to underlie the perception or behaviour of interest. Consequently, the American Marketing Association (1992) argued that conjoint analysis was based on the premise that customers evaluated the value of a product or service through the combination of the utilities[41] they associated with each level of each attribute. Therefore, varying the attribute levels in each product alternative, according to a statistically determined design, makes it possible to estimate utility values for each attribute level that quantify the value that an individual places on each attribute level (Cardello and Schutz, 2003). The utility values, contributed by each attribute level, then determine customers' total utility or overall judgement of a product (Green and Srinivasan, 1978). In that sense, Carson *et al*. (1994) believed that conjoint analysis mimicked real choice situations where respondents were required to simultaneously consider many dimensions of alternatives.

[41] Utility is a numerical expression of the value customers place in an attribute level (American Marketing Association, 1992).

Conjoint analysis has a number of commercial applications of relevance to both marketers and R&D personnel. Hair *et al*. (1998) outlined that key managerial uses of conjoint analysis included the following: the definition of concepts with the optimal combination of features; the determination of the relative importance of each attribute, and attribute level, towards respondents' overall preferences for a product or service; and the prediction of respondents' preferences for new concept features. Hair *et al*. (1998) also stated that conjoint analysis facilitated the process of benefit segmentation through the identification of groups of potential customers with distinct preferences for combinations of attribute levels, and assisted in the identification of market opportunities for new products or services not presently on the market.

Moriarty and Reibstein (1986) stated that differentiated markets were more commonplace in recognition of the heterogeneous nature of customers' values, needs, beliefs and preferences. In that context, Fornell (1992) maintained that the conjoint analysis technique assumed that customers' perceptions of product attributes controlled purchasing patterns, and that the attributes represented the most suitable determinants for conceiving marketing activities. Specifically, Kamakura (1998) and Green and Srinivasan (1978) stated that conjoint analysis could be used to estimate the aggregate utility function that would best explain the preferences of a number of viable market segments. Accordingly, conjoint analysis has been used extensively to estimate the value that customers associate with particular product features, to segment markets based upon the differing benefits sought out by customers, and to make trade-off decisions among alternative design features (Herrmann *et al*., 2000; Green and Krieger, 1991a; Wedel and Steenkamp, 1991; Cattin and Wittink, 1982). Furthermore, Hair *et al*. (1998) and Fornell (1992) stated that conjoint analysis was increasingly used in the process of designing new products, and for the purpose of varying and differentiating product design features. More importantly, Hair *et al*. (1998) and Green and Krieger (1991b) argued that the information generated through conjoint analysis provided customer-driven information to R&D personnel regarding the nature of customers' preferences between alternative product attribute levels that could aid the new product design process.

Hair *et al*. (1998) noted that the flexibility and uniqueness of conjoint analysis arose from its ability to accommodate metric and non-metric dependent variables, the use of

categorical predictor variables, and the general assumptions about the relationship of independent variables with the dependent variable. However, Carroll and Green (1995) maintained that conceptual assumptions related to design, estimation and interpretation were more important for conjoint analysis than for other multivariate techniques. Green and Krieger (1991a) identified six key steps in the conjoint analysis procedure: the determination of key attributes and attribute levels; the selection of a conjoint analysis method; the specification of models that described the relationships between attributes and attribute levels; the selection of levels of measurement; the choice of data collection method; and data analysis.

7.5.1 Determination of Product Attributes and Attribute Levels

The American Marketing Association (1992) considered conjoint analysis unique among multivariate techniques in that hypothetical concepts were generated through a combination of selected attribute levels that characterised a product or service. Green and Krieger (1991a) stated that the selection of relevant attributes and associated attribute levels for use in conjoint-based studies was most frequently achieved through in-depth interviews, focus groups or the repertory grid technique. Griffin (1992) described the repertory grid technique as an iterative process where respondents were presented with triplets of attributes through a series of interviews, and were then asked to identify similarities between two of the three attributes. This process was repeated until no new relevant attributes were identified. Finally, interviewees were asked to select two extreme attribute levels for each attribute, and assign positive or negative values to each attribute level (Griffin, 1992). However, in the case of low involvement products such as foods and beverages, Lee *et al*. (2000) and Bech-Larsen *et al*. (1997) stated that in-depth interviews and focus groups were most frequently chosen to identify the most important attributes and attribute levels that accounted for customers' preferences.

Hair *et al*. (1998) stressed that all determinant attributes that strongly differentiated between choice alternatives should be included in conjoint analysis. Furthermore, Hair *et al*. (1998) also stressed the importance of selecting attributes that customers would realistically encounter in the marketplace. Finally, Wittink and Cattin (1989) emphasised that importance of maintaining a good balance in the number of attribute levels across attributes, as the relative importance of a single attribute would increase

as a consequence of an increase in the number of levels within that attribute. The product attributes and associated attribute levels used in the quantitative element of this research were derived from the results of the qualitative research findings, and through discussions with the technical R&D personnel involved in the overall multi-disciplinary research project. The most relevant attributes and associated attribute levels used in each conjoint-based study are presented over three tables. The number of attribute levels across attributes were balanced in line with best practice (See Table 7.5.1.1 to Table 7.5.1.3) (Wittink and Cattin, 1989). Furthermore, Lilien *et al*. (1992) identified two types of attributes according to their relationship with price: monotone and non-monotone attributes. In this study the type of juice (chilled orange juice surveys), flavour (stimulant beverage survey) and added ingredients or health benefit attributes were deemed monotone attributes as a relationship might be expected between these attributes and price. In that context, SPSS (2001) reported on a number of conjoint studies that identified inter-attribute correlations [42] between certain monotone attributes and price, which were attributed to associations between price attribute levels and intangible factors such as perceived quality. The significance of a relationship between monotone attributes and price, in terms of inter-attribute correlations, is discussed further in Section 7.6.

7.5.2 Types of Conjoint Analysis Methods

Reibstein *et al*. (1988) identified the three most widely used types of conjoint analysis methods as: trade-off conjoint analysis; pairwise conjoint analysis; and full-profile conjoint analysis. In the case of trade-off conjoint analysis respondents are presented with two attribute levels at a time, and are then required to rank all combinations of attribute levels (Jaeger, 2000). Although this approach reduces the risks associated with information overload, as a consequence of evaluating multi-attribute concepts, trade-off conjoint analysis is considered an unrealistic representation of the purchase decision-making process (Natter and Feurstein, 2002). The pairwise conjoint analysis method treats each attribute independently, where respondents are repeatedly presented with pairs of partial profiles for evaluation and are then asked to select the

[42] Inter-attribute correlations denote a lack of conceptual independence between attributes and attribute levels (Hair *et al*., 1998).

Table 7.5.1.1 Product Attributes and Attribute Levels: Chilled Nutrient-enriched Orange Juice Beverages

Product Attribute	Product Attribute Level
Brand	Familiar Brand New Brand
Type of Juice	Freshly Squeezed Not from Concentrate Made from Concentrate
Texture	Contains Fruity Bits Smooth Style
Flavour	Tangy, Sharp, Slightly Bitter Slightly Sweet Sweet
Added Ingredients	None Calcium Calcium, Protein, Vitamins & Minerals
Price	€1.90 per Litre €2.80 per Litre €3.70 per Litre

Table 7.5.1.2 Product Attributes and Attribute Levels: Chilled Probiotic Orange Juice Beverages

Product Attribute	Product Attribute Level
Brand	Familiar Brand New Brand
Type of Juice	Freshly Squeezed Not from Concentrate Made from Concentrate
Texture	Contains Fruity Bits Smooth Style
Flavour	Tangy, Sharp, Slightly Bitter Slightly Sweet Sweet
Health Benefits	None Aid the Immune System Aid the Digestive System
Price	€1.90 per Litre €2.80 per Litre €3.70 per Litre

Table 7.5.1.3 Product Attributes and Attribute Levels: Stimulant Beverages

Product Attribute	Product Attribute Level
Brand	Familiar Brand New Brand
Flavour	Blend of Orange Juice & Spring Water Blend of Apple Juice & Spring Water Lemon & Lime Flavoured Spring Water
Carbonation Level	Still (Non-carbonated) Sparkling (Carbonated)
Added Ingredients	No Added Vitamins, Herbs or Other Stimulant Ingredients B Vitamins and Natural Energy-boosting Ginseng and Guarana B Vitamins, Caffeine and Taurine to Stimulate Both Mind and Body
Type of Packaging	Glass Bottle Aluminium Can Plastic Bottle
Price	€1.25 per 250ml €1.70 per 250ml €2.15 per 250ml

most preferred profile (Koo *et al*., 1999; Ryan, 1999). Finally, the full-profile conjoint analysis method requires respondents to rank or rate a complete profile across all attributes. The full-profile conjoint analysis method was chosen for this study as it presented purchasers with realistic descriptions of alternative hypothetical beverage concepts, and was considered the most suitable method for measuring overall preference judgements (Green and Srinivasan, 1990; 1978). However, the American Marketing Association (1992) maintained that the choice of conjoint analysis method was influenced by the number of attributes and associated attribute levels selected for assessment. For example, the American Marketing Association (1992) stated that the number of attributes and attribute levels were restricted to six attributes and three levels for each attribute in the case of full-profile conjoint analysis. In that context, Hair *et al*. (1998) maintained that higher numbers of attributes or attribute levels would give rise to respondent fatigue. This in turn would lead to a simplification of the conjoint analysis procedure where respondents would naturally only focus on a select number of attributes when evaluating choice alternatives. The attributes and associated attribute levels (See Table 7.5.1.1 to Table 7.5.1.3) could have potentially generated a full factorial design consisting of 324 (3^4

X 2^2) hypothetical beverage concepts in each study. In order to make the task more manageable, Gates *et al*. (2000) and Herrmann *et al*. (2000) stated that a statistically determined design, referred to as a fractional factorial design, was necessary which required respondents to evaluate a small subset of all possible alternative products. The orthogonal design procedure in SPSS, which used a fractional factorial design, made it possible to gather information on a large number of beverage concepts although purchasers only rated a limited number of beverage concepts. Importantly, the fractional factorial design maintained the effectiveness of evaluating the relative importance of a beverage's multi-dimensional attributes (American Marketing Association, 1992).

In each study the fractional factorial or orthogonal design procedure in SPSS generated 20 hypothetical beverage concepts of which 4 were holdout beverage profiles. The 4 holdout beverage profiles would be rated by purchasers but not used in the estimation of utility values. In each study, the holdout beverage profiles made it possible to determine how consistently the conjoint model could predict purchasers' preferences for new functional beverages that were not evaluated by purchasers (SPSS, 2001). The orthogonal design procedure in SPSS randomly generated and sorted the twenty hypothetical beverage concepts in each study to lessen reliability and validity problems with the conjoint models as a consequence of possible respondent fatigue (SPSS, 2001). The 20 hypothetical beverage concepts in each study were presented to respondents in the same sample random order. Although this strategy facilitated ease of analysis, Hair *et al*. (1998) and MacFie *et al*. (1989) warned of both reliability and validity issues, associated with both respondent fatigue and first order and carry-over effects respectively, as a consequence of the presentation order adopted in each study. The measures taken to lessen the effects of these potential problems are discussed in Section 7.5.5.

7.5.3 Conjoint Models

Green and Srinivasan (1978) stated that the flexibility of the conjoint analysis technique was derived from the assumptions made regarding the relationships of the values within an attribute. Therefore, Hair *et al*. (1998) stressed the importance of specifying the general form of the conjoint models prior to the research design. In order for conjoint analysis to explain respondents' preference structures based on

overall preference evaluations alone, it was necessary to make two key assumptions regarding the underling conjoint models: the relationships between attributes i.e. part-worth or interactive models; and the relationships between levels within each attribute i.e. linear, ideal and anti-ideal, or discrete models (Hair *et al*., 1998; American Marketing Association, 1992). The full-profile conjoint analysis method employed in this study used a part-worth function preference model to describe the relationship between attributes, and the calculation of utility values was analogous to regression coefficients (Zubey *et al*., 2002; SPSS, 2001).

Furthermore, the American Marketing Association (1992) described three possible relationships between levels within each attribute: linear models assumed that scores would be linearly related to the attribute levels; ideal and anti-ideal models assumed quadratic relationships between scores and attribute levels; and discrete models where no assumptions would be made regarding the relationships between attribute levels and product scores. In this study a discrete conjoint model was chosen to describe the relationship between attribute levels and product scores. Although price levels would be expected to form a linear relationship with product scores, a discrete 'less' conjoint model was chosen to describe the relationship between price levels and products scores. This form of conjoint model, which does not assume that low price attribute levels always elicit the highest preference scores, is less restrictive than a linear model, and lessens potentially serious validity and reliability issues associated with inter-attribute correlations (Green and Srinivasan, 1990).

7.5.4 Levels of Measurement

Green and Srinivasan (1978) stated that conjoint analysis accommodated both rank order and rating measurement scales. However, Ness (1997) reported that rank order and Likert scales were ambiguous in that many social scientists argued that Likert scales represented interval data while other researchers maintained that Likert scales represented ordinal data. Indeed, Kiess (1989) stressed that it was unclear whether Likert scales truly met the statistical requirements, and specifically parametric assumptions, for interval scale measurement. Lapin (1990) believed this was an extremely important methodological consideration for social scientists, as statistical tests that required calculations of means or variance were invalid if applied to samples from populations with ordinal variates. However, Hair *et al*. (1998) argued

that conjoint analysis had the least restrictive set of assumptions involved in the estimation of the conjoint model. Consequently, Hair *et al*. (1998) stated that parametric assumptions of normality, homogeneity of variance and interdependence were less important than conceptual assumptions in conjoint analysis.

Nonetheless, Smith and Albaum (2004) concluded that rank order scales could be treated as interval rather than ordinal scales where it was assumed that the interval differences, although not constant, were of the same order of magnitude. Specifically, Clason and Dormody (1994) had previously argued that the rank order data collection technique could be treated as an interval scale rather than an ordinal scale, when the integer values that designated the rank order positions were used in the statistical analysis. Similarly, Clason and Dormody (1994) and Hofacker (1984) argued that the Likert scale could also be treated as an interval rather than ordinal scale because, when well constructed, equal distances were assumed to exist between values on the Likert scale. Smith and Albaum (2004) further added that, from a psychological perspective, the Likert numerical scale and corresponding descriptive levels were in equal interval steps. Indeed, the conjoint analysis procedure in SPSS assumes that both rank order and Likert scales are in fact interval measurement scales (SPSS, 2001). Consequently, Smith and Albaum (2004) argued that interval scale statistics could therefore be used on rank order and Likert scale data, and as such, further statistical processes would not violate mathematical assumptions, with the mean serving as the best measure of central tendency. A rating scale was chosen for use in this study in order to avoid validity and reliability problems as a consequence of the large number of concepts presented to respondents for evaluation. Therefore, in this study, the lowest utility values represented less value whereas the highest utility values represented more value from the respondent's perspective.

7.5.5 Data Collection: Conjoint-based Questionnaire Design

Three conjoint-based studies were administered using a paper-based questionnaire format. The conjoint-based study that investigated respondents' preferences for chilled nutrient-enriched orange juice beverages was divided into four sections. In Section 1 respondents were verbally presented with twenty hypothetical chilled orange juice beverage concepts to rate on a nine-point Likert scale corresponding to

their purchase preferences. Section 2 consisted of ten multiple-response questions on respondents' purchase behaviour and consumption of juice-based beverages. In Section 3 respondents' dietary lifestyle, consumption of dairy and non-dairy products, and perceived personal and familial concern regarding calcium intake were determined using eight questions, through a combination of dichotomous style, multiple-response and scaling questions. Section 4 gathered both lifestyle and socio-demographic information (See Appendix 5).

Similarly, the conjoint-based study that investigated respondents' preferences for chilled probiotic orange juice beverages was also divided into four sections. In Section 1 respondents were verbally presented with twenty hypothetical chilled orange juice beverage concepts to rate on a nine-point Likert scale corresponding to how likely they would purchase each hypothetical beverage concept. Section 2 consisted of ten multiple-response questions to determine respondents' purchase behaviour and consumption of orange juice, functional juices and fruit juice. In Section 3 respondents' purchase behaviour towards a range of probiotic products was determined using five questions, through a combination of dichotomous style and multiple-response questions. Section 4 gathered both lifestyle and socio-demographic information (See Appendix 6). Finally, the conjoint-based study that investigated respondents' preferences for stimulant beverages was divided into three sections. In Section 1 respondents were verbally presented with twenty hypothetical soft drink concepts to rate on a nine-point Likert scale corresponding to how likely they would purchase each hypothetical beverage concept. Section 2 consisted of seven multiple-response questions to determine respondents' purchase behaviour and consumption of a range of soft drinks. Section 3 gathered both lifestyle and socio-demographic information (See Appendix 7).

A significant methodological critique of the full-profile conjoint analysis method concerns the increased possibility of respondent fatigue, which can result in reliability and validity problems, as the number of attributes and associated attribute levels increase (American Marketing Association, 1992). Consequently, the most relevant product attributes were selected for each study, and the conjoint-based questionnaires were pilot tested to avoid reliability and validity issues, associated with respondent fatigue and first order and carry-over effects. Furthermore, Green

and Srinivasan (1990) maintained that the fractional factorial design also reduced the possibility of respondent information overload.

In the case of the chilled nutrient-enriched orange juice beverage survey, four hundred conjoint-based questionnaires were administered to purchasers of chilled orange juice in Cork and Dublin, Ireland, between May and September 2004. Similarly, four hundred conjoint-based questionnaires concerning chilled probiotic orange juice beverages were concurrently administered to different purchasers of chilled orange juice in Cork and Dublin, Ireland, between May and September 2004. Finally, four hundred conjoint-based questionnaires concerning stimulant beverages were administered to purchasers of soft drinks in Cork, Ireland, between September and November 2004. For all three conjoint-based studies, respondents were recruited by means of a non-probability sampling method, using a combination of intercept and purposive sampling. In the case of the two functional orange juice beverage surveys, potential respondents were intercepted at a number of shopping centres in both Cork and Dublin City and County, and within University College Cork. In the case of the stimulant beverage survey, potential respondents were intercepted at a number of shopping centres in Cork City and County, and within University College Cork. The use of the intercept sampling technique made it possible to conduct face-to-face interviews with respondents, which was most desirable since conjoint analysis was used. For example, Bush and Hair (1985) concluded from their comparative study that the overall quality of intercept data surpassed that of telephone interviewing and provided for more complete and less distorted responses.

In addition, for both the chilled nutrient-enriched and probiotic orange juice beverage studies, target respondents were selected and recruited based on a positive response to a screening question: "*Do you purchase chilled orange juice at least once every two weeks*"? Purchasers of chilled orange juice were immediately brought to a central location to complete the conjoint-based questionnaire on either chilled nutrient-enriched or probiotic orange juice beverages. In the case of the stimulant soft drink study, target respondents were selected and recruited based on a positive response to two screening questions: "*Do you purchase soft drinks*?" and "*Are you aged 39 years or less?*". Again, purchasers of soft drinks aged 39 years or

less were immediately brought to a central location to complete the conjoint-based questionnaire on stimulant beverages.

7.5.6 Data Analysis

All three conjoint-based questionnaires were analysed using SPSS v11 (SPSS, 2003). For each study, the individual level conjoint analysis procedure in SPSS calculated coefficients using ordinary least square estimations, expressed as utility values, which linked the attribute levels to changes in product ratings (SPSS, 2001). The derived utility values were then used to determine the importance of each attribute. The importance value, expressed out of 100, is calculated by examining the differences between the highest and lowest utilities across the levels of attributes (American Marketing Association, 1992). Pearson's R and Kendall's tau association values, which can range from -1 to +1 in value, were used to assess the validity of the conjoint analysis models for each study. Pearson's correlation coefficient is a robust parametric statistic that can measure the strength of association between two variables even when mathematical assumptions appear violated (Smith and Albaum, 2004). Kendall's tau however is a non-parametric measure of association that makes no assumption regarding frequency distribution (Field, 2003). High positive values for both Pearson's R and Kendall's tau would indicate strong agreement between the averaged product ratings and the predicted utilities from the conjoint analysis model.

K-means cluster analysis was then used to segment purchasers of either chilled orange juice or soft drinks into distinct clusters based on attribute utility patterns. The k-means cluster analysis requires specifying the number of clusters a priori. That is, k-means cluster analysis requires the researcher to identify the number of clusters desired in the solution, and the *centroids* (cluster means) for each (Sireci *et al*., 1999). For k-means cluster analysis, an individual observation is compared with the values of each centroid and assigned to the cluster with which it is most similar. According to Stout *et al*. (1996), the k-means cluster analysis procedure uses similarity between observations by Euclidian Distance as the basis for segmentation. Therefore, for each study, the optimal number of clusters was determined by observation of the agglomeration schedule to identify respondents with similar preferences (SPSS, 2003). Further analysis revealed that key socio-demographic, lifestyle and purchase behaviour variables were not normally distributed in each

study. Therefore, non-parametric tests using Chi-Square and Spearman's rank correlation coefficient were used to investigate relationships between socio-demographic, lifestyle and purchase preference variables in each study.

In addition to providing estimates of the value customers associate with various product attributes, conjoint analysis data can also be used: to simulate market share estimations for both new and competitive products; to evaluate the potential of a multi-product strategy; and to predict trade-offs which customers would be willing to make between product attributes and within attribute levels (Gates *et al*., 2000). Kendall's tau correlation for the four holdout cards was used to determine how consistently the conjoint model could predict purchasers' preferences for new functional beverage concepts that were not evaluated in each survey (SPSS, 2001). A high positive value for Kendall's tau correlation for the four holdout cards would indicate strong agreement between the holdout ratings and the model predictions. In each study, the Kendall's tau correlation for the four holdout cards was within acceptable limits, and indicated agreement between the holdout ratings and the model predictions. It was therefore possible to analyse purchasers' preferences for alternative beverage concepts, which were not evaluated in each study, through simulation analysis. The choice simulation models used in this study employed both maximum and probability (Bradley, Terry, Luce (BTL) and Logit) modelling (Green and Krieger, 1991b). These models estimate the market share for each product by estimating the value that each participant associates with each hypothetical product included in the simulation analysis. According to the American Marketing Association (1992) the maximum utility model assumes respondents will only choose a product with the highest predicted utility score. In contrast, Hair *et al*. (1998) maintained that probability models assumed respondents would not always make decisions using precise notions of utility. Importantly, Hair *et al*. (1998) argued that the predictive power of probability models was greater than the predictive power of the maximum utility model in repetitive purchasing situations associated with low involvement products such as foods and beverages.

For each conjoint-based study, a group level simulation analysis was conducted across clusters. The hypothetical functional beverages used in the group level simulation analysis across clusters, in each study, were generated according to

product profiles that closely matched existing products in the marketplace, and from discussions with the technical partners involved in this multi-disciplinary NPD project. Finally, a group level simulation analysis was carried out within clusters in each study. The hypothetical functional beverages used in the group level simulation analysis within clusters, in each study, were generated from observations of cluster analysis results, and from discussions with the technical partners involved in this multi-disciplinary NPD project.

7.6 Methodological Limitations to the Research

An artefact of qualitative research methods relates to the small sample size and non-representative nature of populations sampled in exploratory studies (Miller, 1991). Specifically, as only 38 purchasers of orange juice were recruited to participate in the in-depth interviews and focus groups, the results of this study would not be representative of the views of the Irish population. However, Fern (2001) argued that qualitative research was not designed to generalise about the sample population in the same way as quantitative research methods. Another possible limitation of the qualitative research design related to the use of convenience and purposive sampling to recruit interviewees and focus group participants that, coupled with the small sample size, further emphasised the non-representativeness of the qualitative survey sample. However, it was envisaged that the explorative nature of the qualitative research would identify issues salient to the research topic, which would provide coherence and direction to the conjoint-based quantitative studies.

In respect of the quantitative or segmentation element to the research, purchasers of ambient orange juice and non-purchasers of orange juice were omitted from the study. Similarly, non-purchasers of soft drinks were omitted from the conjoint-based study that investigated market opportunities for new stimulant beverages. It could therefore be argued that the sampling plan, and the use of purposive sampling in particular, for each conjoint-based study generated data and results from non-representative survey samples. Furthermore, an inherent limitation of the full-profile conjoint analysis technique using SPSS relates to the inability to study or explain inter-attribute correlations between attributes and attribute levels. Hair *et al*. (1998) noted that price in particular exhibited a high degree of inter-attribute correlations with monotone attributes of low involvement products in repetitive purchasing

situations. In that context, the American Marketing Association (1992) reported that alternative conjoint analysis methods such as choice-based conjoint analysis[43] made it possible to estimate and study inter-attribute correlations.

7.7 Summary

This chapter presented the methodology utilised in this research to understand customers' attitudes, preferences and choice motives for a range of new functional beverages. A sequential exploratory research design strategy was employed in this research, through a combination of qualitative and quantitative research methods, to generate market-oriented NPD information on a range of functional beverages, from the customers' perspective. First, the qualitative research methodology used in-depth interviews and focus groups to identify the key product design attributes that influenced customers' choice motives for orange juice and soft drinks, and to explore customers' attitudes and perceptions of a range of new functional beverages. Second, the emerging data from the qualitative or exploratory element to the research was then used to guide the quantitative or segmentation element to the research. The quantitative research methodology used conjoint analysis to model and predict customers' purchase intentions towards a range of functional juices and stimulant beverages. Part IV presents the results and analysis of this study. Chapter 8 presents the results of 15 in-depth interviews and 3 focus groups investigating both the key product design attributes influencing customers' choice motives for orange juice and soft drinks, and customers' attitudes and perceptions of a range of new functional beverages. Then, Chapters 9 and 10 present the results of two conjoint-based surveys examining customers' preferences for a range of chilled nutrient-enriched and probiotic orange juices respectively. Finally, Chapter 11 presents the results of a conjoint-based study investigating customers' purchase preferences for a range of innovative stimulant beverages.

[43] Choice-based conjoint analysis involves the repetitive selection of a full-profile concept from a set of alternative full-profile concepts (American Marketing Association, 1992).

PART IV: RESULTS AND ANALYSIS

Chapter 8: Results: In-depth Interviews and Focus Groups

8.1 Introduction

This chapter presents the results of a qualitative study primarily exploring customers' purchase behaviour towards orange juice, and their attitudes and perceptions towards new and existing functional beverages. Fifteen in-depth personal interviews and three focus groups were conducted during February and March 2003. Focus group participants and interviewees of both genders were recruited across socio-economic groupings and age categories to participate in this study (See Table 8.1.1). A high proportion of interviewees and participants in Focus Groups 1 and 2 attained their highest qualification at third level institutions. Focus Group 1 was also characterised by a higher proportion of young and single adults in comparison to the other groups as evident from Table 8.1.1. Focus Group 2 comprised seven females from both the 'young family' and 'empty nest' lifestyle groupings. Finally, Focus Group 3 had eight elderly customers recruited from a self-catering retirement home. The results of the in-depth interviews and focus groups are presented together in this chapter to show the views and opinions of interviewees and focus group participants, and for ease of presentation.

8.2 General Background Information on Juice Consumption

The majority of interviewees and participants in Focus Groups 1 and 2 reported increased juice consumption over the previous five years. For example, a number of interviewees and participants in Focus Groups 1 and 2 reported a moderate increase in juice consumption, while others reported a more substantial increase in juice consumption:

> "Before I would have bought a bottle of orange juice on the weekend and that was it. Now it [orange juice] is in the house all of the time". Interviewee 11.
>
> "It [orange juice consumption] certainly has increased over the last number of years". Focus Group 1.

Table 8.1.1 Participant Profiles

Socio-demographic Variables	Interviews	FG 1	FG 2	FG 3
Participant Numbers	15	8	7	8
Gender				
Male	6	3	0	4
Female	9	5	7	4
Age Group *(years)*				
18-24	3	4	0	0
25-34	3	2	3	0
35-44	3	2	1	0
45-54	4	0	0	0
55+	2	0	3	8
Marital Status				
Single	5	5	2	1
Married	9	1	3	3
Separated/Divorced	0	0	0	1
Cohabiting	1	2	1	0
Widowed	0	0	1	3
Education				
Primary Level	0	0	0	1
Junior Cert.	1	0	0	1
Leaving Cert.	3	3	3	2
Vocational	0	0	0	2
Third Level	11	5	4	2
Social Class[44]	BC1C2D	C1C2	ABC1	C2DE
Income				
≤€99	2	1	0	0
€100-199	3	4	0	2
€200-299	2	0	4	2
€300-399	0	1	2	1
€400-499	3	1	0	3
€500-599	1	1	0	0
≥€600	4	0	1	0
No. of Child Dependants				
0	9	7	4	8
1	3	1	1	0
2+	3	0	2	0
Location	Cork	Cork	Limerick	Cork

Financial considerations strongly influenced the quantity of juice consumed by a number of interviewees and respondents in Focus Groups 1 and 2. For example, participants in Focus Group 1 who had previously lived abroad considered fruit juice extremely expensive in Ireland in comparison to other countries. Young adult interviewees aged between 18 and 24 years also considered fruit juice expensive in

[44]In this dissertation, social class groupings are determined from Reynolds, J. (1991). *Occupation Groupings: A Job Dictionary* (2nd Edition). London: Market Research Society.

Ireland. Conversely, one female interviewee aged between 25 and 34 years attributed her increased juice consumption to her increased spending power:

> "Before you could get it [orange juice] cheaper whereas now you could be paying two or three Euro for orange juice". Interviewee 3.
> "My consumption of orange juice has increased because I am earning more money. I can now buy more so we end up drinking a lot of it [orange juice]". Interviewee 9.
> "I come from South Africa and there we had a larger variety of juice and it was much cheaper". Focus Group 1.

In contrast, health considerations strongly influenced juice consumption among elderly participants in Focus Group 3. However, health considerations did not influence their consumption of fruit juice in terms of volume quantity but rather the variety of juices consumed. Specifically, a number of elderly discussants drank less orange juice than in the past. Changes in the amount of orange juice consumed were attributed to the belief, on their part, that citrus fruits aggravated the symptoms of arthritis:

> "I read that the citrus fruits were bad for arthritis". Focus Group 3.
> "I now drink more apple juice, and cranberry and raspberry juice". Focus Group 3.

Young male participants in Focus Group 1 and young male interviewees were '*more traditional*' in terms of the variety of fruit juices consumed. These respondents generally consumed orange juice only. In contrast, other interviewees and participants in Focus Groups 1 and 2 were '*more adventurous*' in terms of their fruit juice consumption. This was primarily attributed to the increased variety of fruit juices available on the supermarket shelves. Furthermore, one female interviewee, aged between 25 and 34 years, cited her exposure to different fruit juices while living abroad as the main reason for her liking of different fruit juices and fruit juice blends:

> "The variety has got better over the last few years". Interviewee 3.

"When I went to Australia I got into the habit of drinking different juices and all that so I got to like them". Interviewee 9.

"I love cranberry and apple which you can now get mixed". Focus Group 2.

Cranberry juice consumption appeared to be biased towards females, and older females in particular. A number of female interviewees and female participants across focus groups reportedly consumed cranberry juice. The perceived health benefits of cranberry juice, in terms of the prevention or alleviation of urinary tract infections, strongly influenced their consumption of cranberry juice. The following quotes were typical of the comments made:

"I bought cranberry juice while I was pregnant. Someone told me it [cranberry juice] was good for the kidneys". Interviewee 6.

"They tell you it [cranberry juice] is good for ladies' bladders and cystitis so that is why I drink it". Interviewee 7.

"Cranberry juice is supposed to stop cystitis". Focus Group 3.

8.2.1 Orange Juice Consumption Patterns and Drinking Occasions

Orange juice was consumed by more than one person in the household according to the majority of interviewees and participants across focus groups. Young adults, both male and female, who lived in shared rented accommodation recounted different experiences to those living in the family household. In their case, orange juice tended to be purchased by individual members of the rented household. Different preferences for orange juice available on the Irish market most readily explained why orange juice was purchased individually rather than collectively as a household:

"We all buy our own juice separately. We are very picky". Interviewee 13.

Arising from discussions with interviewees and participants across focus groups it was clear that orange juice consumption was associated with the morning time. The majority of interviewees and focus group participants consumed orange juice in the morning either with or without a breakfast. However, young interviewees and a number of participants across focus groups were quick to point out that orange juice

was also consumed at other times of the day or meal occasions such as with lunch, with an evening meal or as a refreshing beverage:

> "The morning time is the usual hit on the fridge and then when we go home in the evening there will always be someone looking for a drink of something that is nice". Interviewee 8.
> "The first thing I have to have when I come down in the morning is a glass of orange juice". Focus Group 2.

A number of participants in Focus Group 2, and several interviewees of both genders across age groups, considered the refreshing nature of orange juice appealing in the morning time. Participants in Focus Groups 1 and 2 and several interviewees believed the consumption of orange juice revived them in the morning. A minority of interviewees, younger adults of both genders, considered orange juice a replacement for breakfast, particularly if they were rushing out to work. Participants in Focus Groups 2 and 3 and other interviewees also believed that orange juice was consumed in the morning time out of habit. The following were characteristic of the comments made:

> "First thing in the morning it [orange juice] is refreshing, especially if you have been out the night before". Interviewee 10.
> "I find it [orange juice] is a great 'wake up call' in the morning. Your body knows that you are throwing cold orange juice into you". Focus Group 1.

8.2.2 The Motivations for the Consumption of Orange Juice

Focus group participants and interviewees suggested a variety of reasons, which explained their consumption of orange juice. Sensory and health considerations explained why participants chose to consume orange juice over other beverages. Participants in Focus Groups 1 and 2 and several interviewees had previously mentioned that the refreshing nature and thirst quenching properties of orange juice biased their consumption of orange juice towards early morning. Furthermore, a number of these interviewees believed the thirst quenching properties of orange juice to be superior to other beverages such as carbonated soft drinks that helped explain their preferences towards orange juice:

> "You can have a bottle of *Coke* and you will still be thirsty. Orange juice is more like water as it will quench your thirst". Interviewee 2.

Health considerations were also deemed important by interviewees and focus group participants. These health considerations did not relate to specific health benefits per se, for the majority of interviewees and focus group participants, but rather to the perceived general healthiness of one beverage over another. Focus group participants and interviewees considered orange juice a healthier alternative to other beverages, and carbonated soft drinks in particular. This belief was most salient for parents and grandparents of young children. A minority of interviewees, both females aged less than 35 years, purchased orange juice for the specific benefits associated with Vitamin C consumption. One interviewee added that orange juice consumption was a more pleasing way of incorporating Vitamin C into her diet than taking a dietary supplement:

> "I find that when you are drinking a fizzy drink your stomach starts to bloat but with orange juice you can drink a lot and you don't feel bloated". Interviewee 3.
>
> "It is full of Vitamin C and I personally cannot take Vitamin C tablets so juice is part of my regular routine of taking in vitamins". Interviewee 6.
>
> "I would say for children it [orange juice] is more beneficial because a lot of the other things seem to make them hyperactive, like the concentrated cokes and things like that". Focus Group 3.

Several interviewees across gender and age groups, and younger adults in Focus Groups 1 and 2 considered the consumption of fruit juice a positive health behaviour. These respondents equated orange juice consumption with the consumption of fresh fruit. Consequently, these customers reported that they gained a strong sense of mental well-being having consumed orange juice. This seemed most important to interviewees that were insecure regarding the nutritional quality of their own diets, and the following quotes represented some of the comments made:

> "I like to have it [orange juice] there because my diet is probably bad so I feel good if I buy that [orange juice]". Interviewee 1.

"It makes me feel like a better person". Interviewee 13.

8.2.3 The Perceived Health Benefits Gained from Orange Juice Consumption

The majority of interviewees and participants in Focus Groups 1 and 2 were aware of specific health benefits gained from the consumption of orange juice. Most interviewees and participants in Focus Groups 1 and 2 considered orange juice a good source of Vitamin C. These customers held a strong underlying belief in the benefits of Vitamin C to the immune system. Markedly, for these customers, the benefits to the immune system resultant from Vitamin C consumption did not extend to the alleviation or prevention of chronic diseases such as heart disease or cancer. Rather, these customers associated Vitamin C consumption with the alleviation of ailments that one elderly male interviewee referred to as '*minor inconveniences*' such as the alleviation or prevention of colds and influenza. Only one male interviewee aged 37 years mentioned the important role that a diet rich in fruit and vegetables played in the prevention of certain cancers. Female participants in Focus Group 1, and several interviewees across gender and age groups, considered orange juice beneficial to the digestive system. In particular, female respondents believed orange juice alleviated constipation:

> "You need Vitamin C during winter when you are likely to get a cold". Focus Group 1.
>
> "Even when I had my children and they were constipated I would give them orange juice. Even going back to my grandmother's time, if you were constipated and you ate an orange you would be fine". Interviewee 11.
>
> "As part of your five portions of fruit and vegetables it [orange juice] is supposed to stop you getting cancer". Interviewee 15.

8.3 The Important Intrinsic and Extrinsic Orange Juice Attributes which Influenced Interviewees' Purchase Decisions[45]

This research sought to identify the key intrinsic and extrinsic orange juice attributes, and determine the rationale for their perceived importance to customers. The information generated could assist beverage manufacturers find specific market

[45] The issues raised in Section 8.3 were only investigated through, and discussed within, the in-depth customer interviews.

segments and develop new and innovative orange juice beverages that would gain customer acceptance. Interviewees were presented with a list of intrinsic and extrinsic orange juice attributes displayed on a flipchart. Interviewees were then asked to identify the most important orange juice attributes, displayed on the flipchart or otherwise, that helped them discriminate and ultimately choose between the different orange juices available on the Irish orange juice market. Interviewees identified eight orange juice attributes that they considered important when choosing between orange juices. Six attributes of orange juice were considered highly important by interviewees and these included: taste; brand; texture; location in-store; type of juice; and price. A minority of interviewees also considered packaging attributes important and these related specifically to the package size and package design.

8.3.1 Taste as a Key Orange Juice Attribute

An extremely important intrinsic attribute, which influenced interviewees' repurchase probability towards a particular orange juice or orange juice brand, was taste. The vast majority of interviewees, across gender and age groups, were in agreement that the taste of orange juice varied widely between different orange juices and orange juice brands. Not surprisingly therefore, most interviewees recounted having experimented with different orange juices and orange juice brands to identify a juice which most closely met their requirements from a sensory perspective:

> "I will still go for as close to what comes out of an orange and that is on a trial and error basis. When I find an orange juice that comes as close to the taste of oranges I stick with that [particular brand]". Interviewee 8.

Interviewees recounted that, based upon past experiences, certain sensory descriptors helped distinguish between orange juices. Interestingly, interviewees' preferences for variations within these sensory attributes were influenced by past sensory experience, and their perceptions of how fresh orange juice should taste. According to the vast majority of interviewees, the sensory descriptor that most distinguished between orange juices was the degree of sweetness. A number of interviewees also remarked that sensory descriptors which related to flavour strength, odour strength, and mouthfeel also helped distinguish between orange juices and orange juice brands. The degree of sweetness was considered the most important sensory descriptor that

distinguished between orange juices, and influenced interviewees' overall preferences for certain orange juices or orange juice brands, over others. More importantly, from both a marketing and sensory perspective, the desired sweetness level differed noticeably for customers of freshly squeezed orange juice, and customers of 'made from concentrate' and 'not from concentrate' orange juices. For example, interviewees that purchased either 'made from concentrate' or 'not from concentrate' orange juice preferred a sweet or a slightly sweet tasting orange juice. However, these interviewees preferred a natural sweet flavour rather than an unnatural sweet flavour attributed to the addition of sugar. Conversely, purchasers of freshly squeezed orange juice expressed different sensory requirements. These customers preferred a '*sharp*' and '*tangy*' tasting orange juice and notably less sweet than other orange juices and orange juice brands:

> "Some [orange juices] are sweeter than others. I like a sweet orange juice but not as sweet as pineapple". Interviewee 13.
> "I like it [orange juice] kind of light with the bits and a little bit of a sharp edge to them. Slightly tangy, but not too much". Interviewee 9.

A number of interviewees also suggested that certain sensory descriptors, which related to the intensity of flavour, odour, and mouthfeel, indicated the presence or absence of added water. Clearly, for these customers, the perception of '*added water*', and its effects on the sensory character of orange juice, influenced their preference for certain orange juices and orange juice brands over others. These interviewees encountered certain orange juice brands that lacked flavour, odour, or mouthfeel, which from their perspective, suggested water had been added to the orange juice:

> "I don't really like the [orange] juices that taste watery. It is as if they have been watered down". Interviewee 1.
> "You should be able to smell orange juice. If you can't then it [orange juice] must have a lot of water added to it". Interviewee 13.

8.3.2 The Influence of Branding on Orange Juice Purchase Behaviour

The majority of interviewees described a high level of inertia when purchasing, and specifically repurchasing, orange juice. These customers recounted satisfaction with

the brand of orange juice they consumed and were content to purchase the same orange juice brand on a weekly basis. However, one female interviewee changed orange juice brands regularly. The inertia associated with the purchase of orange juice related to the importance that interviewees placed upon past sensory experiences when they purchased and repurchased orange juice. Interviewees reported that, through experience, they recognised and associated the desired sensory attributes with certain orange juice brands, which reduced the necessity to experiment further with different orange juices and orange juice brands:

> "You try a certain number of them [orange juice brands] and you figure out which [brand] tastes the best. Then all I have to do is look for this brand". Interviewee 2.
>
> "Sometimes you get fed up of the same one [brand]. I can change around with the different orange juice brands". Interviewee 14.
>
> "I know the taste [of the brand] and I can just grab it". Interviewee 9.

8.3.3 Textural Attributes which Influenced Orange Juice Choice

The texture of orange juice was considered extremely by the vast majority of interviewees. Only a minority of interviewees, both over 45 years of age, considered the texture of orange juice unimportant in terms of their purchase preferences. These customers consumed orange juice either with or without fruit pieces. Interestingly, it seemed that texture was the only intrinsic attribute where some customers reportedly made trade-offs, where they took into account the preferences of other family members. For example, some interviewees who preferred orange juice that contained fruit pieces purchased orange juice without fruit pieces in order to satisfy the preferences of other family members. Conversely, where family members did not express a preference for a particular style of juice, the main purchaser of orange juice decided which style of orange juice to purchase.

A considerable number of interviewees across age groups, the majority of whom were female, preferred orange juice that contained fruit pieces. The sensory enjoyment gained from the consumption an orange juice with fruit pieces was considered important by these interviewees. They commented that their sensory perceptions were heightened when fruit pieces were present in the orange juice. These customers either

enjoyed orange juice more, or believed orange juice tasted better, when fruit pieces were present in the juice. A number of interviewees believed that the presence of fruit pieces was characteristic of freshly squeezed orange juice. Therefore, the presence of fruit pieces implied a product that most closely resembled '*fresh*' orange juice. Consequently, interviewees perceived an orange juice that contained fruit pieces as a more '*natural*' product than an orange juice without fruit pieces. Furthermore, one female interviewee equated the removal of fruit pieces with the processing of orange juice, and the following quotes supported the opinions raised:

> "I would enjoy it [orange juice] more with the fruit bits in them". Interviewee 1.
>
> "It [fruit pieces] adds a bit of body to the juice and it feels more natural. It gives the perception that it is a natural product". Interviewee 9.

One male interviewee gave a different perspective on the importance of fruit pieces in orange juice. This interviewee perceived orange juice that contained fruit pieces healthier than smooth-style orange juice based upon the importance of fruit in the diet:

> "In the back of my mind I think it [orange juice with fruity bits] might be better for you because there are bits of fruit in it maybe". Interviewee 15.

Just as sensory considerations were deemed important in the purchase of orange juice that contained fruit pieces, sensory displeasure explained why certain customers chose to purchase smooth-style orange juice. A number of interviewees disliked the sensory experience gained from the consumption of orange juice with fruit pieces, and preferred smooth-style orange juice:

> "I just find it [orange juice with fruity bits] a very strange sensation. I mean you have these little bits in your mouth floating around". Interviewee 3.

8.3.4 In-store Location as a Key Orange Juice Attribute

The majority of interviewees preferred orange juice from the chilled cabinet as location in-store was associated with the perishability of orange juice. Interviewees purchased orange juice from the chilled cabinet based upon the perceived freshness

and naturalness of chilled orange juice. The prevailing reason articulated by the majority of interviewees for choosing chilled over ambient stored orange juice related to concerns regarding the perceived presence of preservatives in ambient stored orange juice:

> "I would presume that the juices in the chilled cabinet are more natural in the sense that there are no preservatives in them or anything like that". Interviewee 5.
>
> "Anything that is on the shelf and is supposed to be fresh must have some preservatives in it. Don't they tell you that anything that is fresh must be kept in the fridge". Interviewee 7.
>
> "[I buy chilled orange juice] because of the freshness thing. The others [ambient stored orange juice] are always that bit artificial". Interviewee 9.

A number of interviewees suggested that the habitual nature associated with the purchase of certain foods and beverages from specific locations within the supermarket explained why they purchased orange juice from the chilled cabinet. Clearly, the consumption of orange juice at refrigeration temperature was important to some interviewees, and noticeable differences in the sensory character of orange juice stored or consumed at ambient temperature were highlighted. An inability to differentiate between chilled and ambient stored orange juice was a sentiment shared by interviewees who chose to purchase ambient stored over chilled orange juice. The habitual purchase of orange juice from the supermarket shelf also explained why one female interviewee purchased ambient stored orange juice. The following quotes exemplified the views raised:

> "Maybe it [chilled orange juice] is to fool people into thinking that in some ways it is more like real orange juice". Interviewee 4.
>
> "There isn't that saccharine sweet taste [from orange juice] coming out of the chilled cabinet as against what will come off the shelf". Interviewee 8.
>
> "It is probably out of habit that I buy orange juice from the chilled cabinet in the supermarket". Interviewee 11.

8.3.5 Type of Juice as a Key Orange Juice Attribute

Initially, it appeared that purchasers of freshly squeezed and 'not from concentrate' orange juices considered the type of juice more important, in terms of choosing between orange juices, than purchasers of 'made from concentrate' orange juice. As the discussions evolved it became clear that the type of juice was important to the vast majority of interviewees irrespective of the type of juice purchased. Interestingly, it was the motivational factors for the choice of one type of juice over another, and the degree of importance attached to these motivational factors, that varied markedly between these customer segments. The motivation for the purchase of freshly squeezed or 'not from concentrate' orange juice over 'made from concentrate' orange juice was primarily influenced by interviewees' perceptions of quality, and what they perceived to be a superior product. More specifically, these types of orange juice were predominantly differentiated from 'made from concentrate' orange juice on the basis of perceived freshness. These interviewees believed 'made from concentrate' orange juice underwent a higher degree of processing than other types of orange juice. A number of these interviewees perceived 'made from concentrate' orange juice a diluted form of freshly squeezed orange juice while others believed considered it reconstituted orange juice powder. Freshly squeezed orange juice was distinguished from 'made from concentrate' orange juice on the basis of perceived purity and naturalness, attributed to low a fruit content, and high levels of additives in 'made from concentrate' orange juice:

> "The type of juice is important because I buy the *Tropicana* orange juice. They tell you it ['not from concentrate' orange juice] is made from freshly squeezed oranges". Interviewee 7.
>
> "It ['made from concentrate' orange juice] has to be boiled down to death. I don't know how it ['made from concentrate' orange juice] can be good. It is like vegetables, the less cooking time the better". Interviewee 8.

Sensory preferences explained why certain interviewees preferred freshly squeezed or 'not from concentrate' orange juice over 'made from concentrate' orange juice. Purchasers of freshly squeezed orange juice remarked that the availability of freshly squeezed orange juice varied throughout the year. These customers therefore considered the 'not from concentrate' orange juice an acceptable alternative to freshly

squeezed orange juice. However, these customers would not consider the purchase of the 'made from concentrate' orange juice:

> "If I go to the fridge and the *Tropicana* is gone, and *Sqeez* is there, then I won't drink it because I don't think it [*Sqeez]* is as nice". Interviewee 7.
> "The odd time I would buy *Tropicana*. There can often be a fall in supply [of freshly squeezed juice] on a given day and sometimes you have to settle for second best [*Tropicana*]". Interviewee 8.

Sensory preferences explained why a number of interviewees chose to purchase 'made from concentrate' orange juice over freshly squeezed or 'not from concentrate' orange juices. Purchasers of 'made from concentrate' orange juice disliked certain intrinsic attributes that they felt characterised freshly squeezed orange juice from a sensory perspective. These customers preferred a sweeter tasting orange juice. In contrast, freshly squeezed orange juice was characterised by them as bitter tasting and less sweet. Furthermore, one young male interviewee, who preferred smooth-style orange juice, associated the presence of fruit pieces with freshly squeezed more than with 'made from concentrate' orange juice. A number of these interviewees mentioned that the price differential between 'made from concentrate' and freshly squeezed orange juice biased their purchase decision towards 'made from concentrate' orange juice. However, within the 'made from concentrate' range of juices on the Irish market, differences in sensory character were recalled, and sensory preferences were taken into account when customers chose between juices of varying price, and the following statements typified the points raised by interviewees:

> "I choose to buy the cheaper juice, but it is 'nice' cheap juice if you know what I mean". Interviewee 4.
> "Through the process of making the 'made from concentrate' you don't have the natural bitterness of freshly squeezed orange juice". Interviewee 10.

Interviewees' opinions and expectations of the various types of orange juice were strongly influenced by the perceived degree of processing employed to manufacture the different types of orange juice. Interviewees' perceptions and expectations of 'made from concentrate' orange juice, irrespective of the type of juice purchased, were

negative. The vast majority of interviewees believed ‘made from concentrate’ orange juice underwent a higher degree of processing than other types of orange juice. For example, several interviewees assumed water was added to ‘made from concentrate’ orange juice. Purchasers of ‘made from concentrate’ orange juice believed additives, and primarily preservatives, were found in ‘made from concentrate’ orange juice. However, purchasers of freshly squeezed orange juice expressed stronger feelings towards ‘made from concentrate’ orange juice. Freshly squeezed orange juice was distinguished from ‘made from concentrate’ orange juice on the basis of perceived purity and naturalness. This viewpoint was based upon the perceived low fruit content, and high levels of additives such as preservatives, flavourings, sugar or added water, in ‘made from concentrate’ orange juice:

> “It [‘made from concentrate’ orange juice] is not pure. It has a lot of additives. It is a made-up formula as far as I am concerned”. Interviewee 11.
>
> “Isn’t it [‘made from concentrate’ orange juice] powered stuff that is made up with water? I think it is mixed with water to make it orange juice”. Interviewee 15.

The majority of interviewees did not understand the term ‘not from concentrate’ orange juice. However, interviewees held certain views towards, and expectations of, ‘not from concentrate’ orange juice. Interestingly, the majority of interviewees that purchased ‘made from concentrate’ orange juice equated ‘not from concentrate’ orange juice with freshly squeezed orange juice. In contrast, purchasers of ‘not from concentrate’ and freshly squeezed orange juice considered the ‘not from concentrate’ orange juice less processed in comparison to the ‘made from concentrate’ orange juice. The expectations of purchasers of freshly squeezed orange juice were higher than for purchasers of ‘made from concentrate’ and ‘not from concentrate’ orange juice. Several purchasers of freshly squeezed orange juice only bought orange juice squeezed in-store, and wouldn’t purchase freshly squeezed orange juice from the chilled cabinet:

> “I assume it’s less processed than the ‘made from concentrate’”. Interviewee 9.

"I would presume that it [freshly squeezed orange juice] is straight from the orange. I would expect it to be squeezed straight in front of me". Interviewee 14.

8.3.6 The Influence of Price on Orange Juice Purchase Behaviour

Purchasers of 'not from concentrate' and freshly squeezed orange juice were willing to pay a higher price for a product they considered to be superior from a quality and sensory perspective. Purchasers of 'made from concentrate' orange juice reportedly made trade-offs between the retail price and taste. These customers commented that even within the 'made from concentrate' range of juices on the Irish market, differences in sensory character were evident, particularly with respect to the own-label economy range of orange juices. Sensory considerations were important to many of these interviewees and most of them chose to purchase a more expensive brand from the 'made from concentrate' orange juice range. Purchasers of 'made from concentrate' orange juice were most influenced by promotions and special offers. In particular, promotions and special offers appealed to larger households or where a large quantity of orange juice was consumed within a household:

"With the *Sqeez* orange juice, it is just more juicy, whereas with the other brands you are only paying seventy cent so you notice the difference". Interviewee 1.

"We always bought the *SuperValu*[46] four litre packs because there were so many of us living at home". Interviewee 1.

"*SuperValu* or *Dunnes Stores*[47] often sell four juices for the price of three. I would usually be tempted by something like that". Interviewee 5.

8.3.7 Package Size as a Key Orange Juice Attribute

The package size preferred by interviewees was influenced by the place of consumption, as well as their perceptions of value and perishability. Ready-to-drink juices were not considered good value by interviewees that primarily purchased orange juice for home consumption, and most interviewees purchased one-litre cartons

[46] *SuperValu* is part of *Musgrave SuperValu-Centra*, the retail franchise division of the *Musgrave Group*. *Musgrave SuperValu-Centra* is the largest independent retailer in Ireland (Mintel, 2002c).

[47] *Dunnes Stores* is the largest privately owned company in Ireland and is primarily a food retailer within the Republic of Ireland. *Dunnes Stores* is positioned at the middle to lower end of the mass market (Mintel, 2002c).

or bottles of orange juice. Other interviewees that lived alone or in small households purchased one pint cartons or bottles over larger pack sizes:

> "I wouldn't buy a larger carton because if you don't drink it within a certain time you get juice settling at the bottom". Interviewee 2.
> "The small bottles of orange juice are not good value. I really only buy the bigger cartons". Interviewee 9.

8.3.8 Customers' Perceptions of Orange Juice Package Design Attributes

Explorative discussions with interviewees concerning the extrinsic attributes of orange juice, and specifically package design issues, sought to generate information from customers that could assist beverage manufacturers develop a more optimal orange juice package design. Interviewees were presented with a selection of one-litre orange juice cartons and bottles for evaluation. The juices selected for evaluation reflected the range of one-litre packages available on the Irish orange juice market. These packages differed in terms of shape, graphic design, opening devices and tamper-evident seals. Particular emphasis was also placed upon the importance of label information, and particularly nutritional information, to customers. To this end, interviewees were presented with a list of label information, displayed on a flipchart, typically found on orange juice cartons and bottles. Interviewees were then asked to select the label information of most importance to them. Finally, interviewees were again presented with a range of orange juice cartons and bottles and the descriptors associated with each carton/bottle were discussed.

A small number of interviewees considered package design issues important in terms of their choice of orange juice brand. These interviewees considered the shape and opening device extremely important when they chose between orange juices. Interviewees disliked the *Classic Tetra Brik* and *Tetra Brik Slim* cartons characteristic of *Del Monte* and *Libby's*, and *Fruice* respectively, which was attributed to the absence of a pouring neck. Interviewees recounted a greater likelihood of spillages with the *Tetra Brik* cartons than with the *Pure-Pak* gable-top cartons characteristic of *Tropicana* and *Sqeez*. Some interviewees reportedly took the packaging material into account when they chose between orange juice brands. For example, certain

interviewees considered cardboard cartons more acceptable to plastic bottles from a sensory perspective:

> "I think that if you buy orange juice in a plastic bottle and you leave it in a fridge, even if it is still in date, there is a bad taste". Interviewee 7.
> "There is a better pouring nozzle on the *Tropicana* and *Sqeez*". Interviewee 8.
> "The *Fruice* is more likely to spill because the cap isn't tilted". Interviewee 13.

Interviewees also held strong opinions regarding the opening devices utilised by competing orange juice brands based upon past experience. Most interviewees reported that the 'screw-on' cap characteristic of *Pure-Pak* gable-top cartons were easy to open whilst difficulties were recounted with the 'flip-top' cap characteristic of *Classic Tetra Brik* and *Tetra Brik Slim* cartons such as *Del Monte* and *Libby's*. The majority of interviewees preferred the 'drop down' tamper evident band used by *Tropicana*. In contrast, the majority of interviewees disliked the 'aluminium foil pull tab' tamper evident seal used in *Classic Tetra Brik* and *Tetra Brik Slim* cartons and interviewees recounted great difficulty in removing the foil cleanly from the carton. A number of interviewees also disliked the 'penetration board' tamper evident seal characteristic of *Sqeez*. In particular, older interviewees encountered difficulties with the removal of the plastic 'ring pull' tab characteristic of *Dawn* orange juice.

> "Once or twice you would get it [*Sqeez*] and have to press something down to open it and the seal around it would break. It might leak the odd time". Interviewee 2.
> "I don't like the *Del Monte* or the *Libby's* packaging because sometimes when you open them they [the opening device] break off". Interviewee 5.
> "I don't like the *Dawn* carton. I found that ring pull used to break when I would pull it up. I used to find that really annoying". Interviewee 9.

Interviewees were again presented with a selection of orange juice cartons and bottles for evaluation, which reflected the range of orange juices packages, and associated descriptors and label information, available on the Irish orange juice market. Purchasers of freshly squeezed and 'not from concentrate' orange juice seemingly checked the use-by-date more frequently than purchasers of 'made from concentrate'

orange juice. Generally, interviewees were uninterested in the information, and particularly nutritional information, found on cartons or bottles when they purchased orange juice. Interviewees disinterest in the nutritional information on orange juice cartons and bottles seemed to stem from the assumptions of orange juice being devoid of fat and cholesterol, and a source of Vitamin C. This assumption appeared to hold across brands. The vast majority of interviewees preferred the Vitamin C content expressed as a percentage of the Recommended Daily Amount (RDA) rather than expressed in milligrams:

> "People know that there is Vitamin C in orange juice and there is no fat in there either". Interviewee 11.
>
> "The RDA is more of a benchmark than the content in milligrams. You wouldn't know what quantity [of vitamins] in milligrams would be beneficial or not". Interviewee 15.

Discussions revealed that interviewees were most concerned with the quality and purity of orange juice. They were specifically concerned with the perceived presence of sugar, preservatives or colourings in certain orange juices. Consequently, the label '*no added sugar, preservatives or colour*' was considered extremely important in their choice of orange juice. Interviewees were particularly negative towards orange juice that contained added colourings. The addition of colourings to orange juice was considered unnatural. The vast majority of interviewees were unimpressed with the descriptor '*premium*'. Interviewees were more receptive towards descriptors such as '*pure squeezed*', '*100 per cent natural*' and '*pure orange juice*'. Again, their attitudes towards these descriptors appeared to be influenced by their perceptions and expectations of orange juice. However, purchasers of freshly squeezed orange juice were sceptical of the descriptor '*pure orange juice*', particularly when the term was associated, from their perspective, with 'made from concentrate' orange juice:

> "Added colour to orange juice. I don't see the point. It should be orange anyway. If they need to add colour then there must be something wrong [with the orange juice]". Interviewee 2.
>
> "You are used to seeing '*pure*' on it ['made from concentrate' orange juice] and you don't believe it anyway". Interviewee 5.

> "I can't see the point for the use of the word '*premium*' in describing orange juice. What is a premium orange?" Interviewee 8.

8.4 Customers' Perceptions of Functional Orange Juices

The majority of interviewees and focus group participants did not purchase functional orange juice such as *Sqeez Calcium* or *Tropicana Multivitamins*. The explanations that accounted for such a low uptake of functional orange juice by customers ranged from apathy and indifference to negative attitudes and fear in relation to the addition of ingredients to orange juice. A number of interviewees were indifferent to the addition of functional ingredients such as calcium or multivitamins to orange juice. A high level of inertia also explained why some interviewees purchased regular orange juice over functional orange juice:

> "I have never spent much time looking at the orange juice carton as such. I really go into the supermarket and grab my orange juice and go". Interviewee 6.
>
> "I would have passed the *Sqeez Calcium* and not even look at it". Interviewee 11.

Several interviewees and a number of participants in Focus Group 1 held negative attitudes towards the addition of functional ingredients to orange juice. The positive perception of orange juice as a '*natural*' product explained why some interviewees and focus group discussants had negative feelings towards the concept of functional orange juices. Focus Group 1 participants were particularly discerning and selective of the types of functional juices they considered acceptable. This particular group disliked the concept of adding multiple nutrients to orange juice. Instead, this group considered the addition of selective nutrients more acceptable. A number of interviewees and participants across focus groups preferred to obtain their nutrients from natural foods, as part of a balanced diet, rather than from functional juices. Focus Group 3 participants, the majority of whom consumed dietary supplements, were apprehensive towards the consumption of both dietary supplements and functional orange juice beverages:

> "If you take orange juice it is beneficial the way it is naturally. Why would you need to throw all of this stuff on top of it as well?" Focus Group 1.
>
> "I wouldn't be inclined to buy it [a functional orange juice] because I get the impression that some powder or chemical is added to the juice. I would prefer if it came naturally from the juice". Interviewee 9.
>
> "I'd be afraid that if you were taking something else [along with supplements] that you might get too many vitamins, and that you would overdose". Focus Group 3.

Some interviewees and participants in Focus Group 2 accepted functional foods and beverages more than Focus Group 1 participants. A small minority of interviewees and a number of participants in Focus Group 2 purchased functional orange juice. Dietary and health concerns, and concern for family members in particular, motivated their purchase functional orange juice. However, interviewees and focus group participants emphasised the importance of sensory liking as a determinant of the repurchase probability of functional orange juice:

> "If I tasted it [a functional juice] and it wasn't nice then I wouldn't buy it again." Interviewee 2.
>
> "I have one daughter and she doesn't drink milk and she doesn't eat a lot of dairy products so that is one reason why I bought it (*Sqeez Calcium*)". Interviewee 7.

The majority of interviewees and focus group participants expected to pay a higher price for functional orange juice. However, most interviewees and focus group participants were unwilling to pay an extra Euro, above what they would normally pay, for an orange juice offering extra health benefits:

> "A few cents, maybe twenty or thirty cent. I wouldn't pay an extra Euro [for a functional orange juice]". Interviewee 3.
>
> "I would be willing to pay the fifty or sixty cent extra but not a Euro extra. When you go over the Euro you think it is over a [Irish] Pound, which it is not, but you'd think a [Irish] Pound is a lot". Interviewee 14.

A number of interviewees and young adults in Focus Group 1 were uninterested in the endorsement of *Sqeez Calcium* by the Irish Osteoporosis Society. These customers felt the endorsement alone would neither attract their attention nor encourage them to purchase functional orange juice. Other interviewees and participants in Focus Groups 2 and 3 were more positive towards a health endorsement in terms of its role in the education of customers, and increased awareness of the importance of calcium in the alleviation or prevention of osteoporosis. However, older adults in Focus Group 1 were more cautious regarding the use of a health endorsement by juice manufacturers:

> "It wouldn't be enough to have a logo on the [orange juice] packet. They would need some sort of justification as to why they are endorsing it [a functional orange juice]". Focus Group 1.
>
> "To be honest I don't think it [a health endorsement logo] would make me go out and buy it". Interviewee 6.

8.5 Customers' Attitudes and Perceptions Towards the Probiotic Orange Juice Concept

The majority of interviewees and participants across focus groups were receptive towards the probiotic orange juice concept. Most interviewees and focus group participants would not purchase both their regular orange juice and a probiotic orange juice. Consequently, respondents stressed that a probiotic orange juice would have to be comparable to their regular orange juice from a sensory perspective. Purchasers of probiotic dairy drinks alluded to a distinct competitive advantage offered by probiotic orange juices over probiotic dairy drinks. A probiotic orange juice was considered to offer better value for money in terms of serving size than probiotic dairy drinks. A probiotic orange juice was also considered a more refreshing alternative to probiotic dairy drinks. The probiotic orange juice concept also appealed to customers that disliked the taste of yoghurt or probiotic dairy drinks. Purchasers of dietary supplements that contained probiotic cultures offered a different perspective on probiotic orange juices to purchasers of probiotic dairy drinks. They differentiated supplements that contained probiotic cultures from other probiotic foods based upon the perception of a higher concentration of probiotic bacteria in the supplements. Consequently, these customers gained greater assurance from the consumption of supplements than from other probiotic products:

"The size of that [*Actimel*] puts me off because it is tiny. All it takes is one gulp and they are gone". Focus Group 2.

"I would prefer to see the benefits in the juice if I thought they [probiotic bacteria] were in it because it would be an enjoyable drink". Interviewee 5.

"I don't think there are as many bacteria in the *Actimel* as in the supplement. That is why I take it [a probiotic supplement]". Interviewee 10.

The majority of interviewees and participants across focus groups were most receptive towards, and trusting of, probiotic orange juices positioned on a general well-being platform. The two most preferred probiotic orange juices claimed to either aid the immune system or the digestive system. It appeared that the inherent benefits associated with orange juice influenced customers' preferences towards, and credibility in, these particular probiotic orange juice concepts. According to several interviewees and focus group participants, the natural association between orange juice consumption and the prevention or treatment of colds and influenza strengthened the credibility of a probiotic orange juice that claimed to aid the immune system. Conversely, customers were generally sceptical of a probiotic orange juice that claimed to alleviate or prevent chronic diseases, such as the prevention of certain cancers. Interestingly, the inherent benefit gained from orange juice consumption vis-à-vis the digestive system explained why a number of interviewees and some participants in Focus Groups 1 and 2 rejected the concept of a probiotic orange juice that claimed to prevent or alleviate diarrhoea. The benefits afforded by probiotic cultures through the prevention or alleviation of diarrhoea contradicted the perceived inherent benefit of orange juice with regard to the alleviation or prevention of constipation:

"In my head orange juice is something that causes diarrhoea". Focus Group 1.

"You mentioned earlier about the juice to prevent diarrhoea in young children. There are not a lot of parents who would give very young children orange juice anyway because it would go through them". Focus Group 2.

"It would be hard to tell people how it [a probiotic orange juice] would protect against certain cancers". Interviewee 11.

Exploratory discussions with interviewees and focus group participants identified a number of potential nutrients that could be incorporated into the probiotic orange juice concepts, which claimed to either aid the immune or digestive systems. A number of female interviewees and participants across focus groups considered Echinacea[48] beneficial to the immune system. However, several participants in Focus Group 2 recounted a strong off-flavour associated with Echinacea that could negate its addition to a probiotic orange juice from a sensory perspective. Some interviewees and participants in Focus Groups 1 and 2 were in agreement that Zinc also contributed to a healthy immune system. A number of interviewees across gender and age groups, and participants in Focus Groups 1 and 2, believed orange juice contained an adequate amount of fibre, and these customers perceived digestive problems associated with the addition of extra fibre to probiotic orange juice. The majority of interviewees expressed a preference for probiotic orange juice that offered multiple benefits over a singular benefit, and economic reasons most readily explained their preferences for a multi-functional probiotic orange juice. A number of participants in Focus Groups 1 and 2 were highly critical of the claims associated with the leading probiotic yoghurts and probiotic dairy drinks on the Irish market. Not surprisingly, participants in Focus Groups 1 and 2 expressed negative views towards the concept of a multi-functional probiotic orange juice. These customers considered health claims associated with the multi-functional probiotic orange juice less credible than the claim associated with a probiotic orange juice that offered a singular benefit:

> "That [multiple benefits] is promising too much. If you go for more than one benefit than people are going to go 'no way'". Focus Group 1.
>
> "If you have a product that says that it does this, this and this [multiple benefits], then you would say 'it can't really do all of those things'". Focus Group 2.

8.6 Customers' Attitudes Towards the Nutrient-enriched Orange Juice Concept

Interviewees and focus group participants were then introduced, by means of product prompts and information on a flipchart, to the concept of a nutrient-enriched orange

[48] *Echinacea angustifolia* is a prairie flower native to North America used mainly in the treatment of colds, influenza, wounds, candidiasis and lung conditions (Meskin *et al*., 2002).

juice. Customers' perceived calcium intake from dairy products or dietary supplements clearly influenced their purchase intent towards a nutrient-enriched orange juice. The majority of interviewees and participants in Focus Group 1 believed their consumption of dairy products, and ultimately their calcium intake, to be adequate. A small minority of interviewees and participants in Focus Group 1 expressed negative sentiments towards a nutrient-enriched orange juice. These customers preferred to obtain calcium from milk rather than from a functional orange juice. Furthermore, some participants in Focus Group 1 did not associate dairy-related nutrients with orange juice and therefore considered the concept unappealing. Consequently, these customers were uninterested in and were unlikely to purchase a nutrient-enriched orange juice in the future. Conversely, interviewees and focus group participants that believed their calcium intake inadequate expressed a strong interest in a nutrient-enriched orange juice.

> "I think it [a nutrient-enriched orange juice] is a good idea but not for me. I think I drink enough milk. I eat lots of cheese". Focus Group 1.
> "I prefer to get calcium from the milk where calcium comes from and not from the [functional] orange juice". Interviewee 13.

On the other hand, the majority of interviewees and participants across focus groups perceived value in a nutrient-enriched orange juice. Customers' receptiveness towards the development of a nutrient-enriched orange juice reflected a general concern in the perceived low intake of dairy products and calcium within society, particularly among women, young children and teenagers. Therefore, a nutrient-enriched orange juice was considered beneficial by most interviewees and focus group participants if it enhanced the quality of a person's diet. Discussions with interviewees and focus group participants highlighted product design issues of importance to functional juice manufacturers. The majority of interviewees and participants across focus groups were receptive towards an orange juice enriched with vitamins and minerals associated with milk. However, interviewees and focus group participants considered a functional orange juice that offered the full nutritional composition of milk unappealing. Customers rejected the addition of fat, from a fruit source or otherwise, to orange juice. In their opinion, the concept of a functional orange juice that offered the full

nutritional composition of milk would not appeal to those customer groups perceived most at risk from dairy-related nutrient deficiencies such as young female teenagers:

> "There are an awful lot of people growing up who don't get a lot of calcium in their diet. They could benefit from this type of juice". Focus Group 1.
> "If you put added fat into juice then a lot of women are going to run when the word fat appears. Especially adding to a product that would not normally have any fat". Focus Group 2.
> "I think it [a nutrient-enriched orange juice] is a good idea because there are a lot of kids who don't drink milk but will drink a juice so I mean they are going to get calcium from these juices". Interviewee 7.

8.7 Customers' Attitudes and Perceptions Towards Stimulant Beverages

The majority of interviewees and focus group participants would not purchase a stimulant orange juice. Purchasers of stimulant drinks were also reluctant to purchase a stimulant orange juice. The stimulant orange juice concept was considered unnatural, and it appeared that customers' positive perceptions of orange juice were at variance with their negative perceptions of the stimulant orange juice concept. In particular, interviewees and participants across focus groups considered the addition of stimulant ingredients, such as caffeine and taurine, an adulteration of orange juice. Furthermore, Health concerns were of particular importance to older interviewees and elderly participants in Focus Group 3, and these customers rejected the stimulant orange juice concept. These customers recounted adverse effects from the consumption of caffeine such as palpitations and heartburn:

> "Orange juice seems such a natural product. Why add those [sugar, caffeine and taurine] into it". Focus Group 2.

Young adults perceived undesirable off-flavours associated with a stimulant orange juice attributed to taurine and caffeine based upon past experience. These customers also associated stimulant drinks with an intense sweetness attributed to the addition of sugar. An intense sweetness was considered an undesirable characteristic in orange juice. Herbal extracts and botanicals were considered more acceptable, and more appropriate, for use in a stimulant orange juice beverage than the addition of caffeine

and taurine, by a number of interviewees and by some participants in Focus Groups 1 and 2. It appeared that, for these customers at least, their perceptions of orange juice as a healthy and natural beverage directed their interest towards functional ingredients perceived to be both natural and healthy such as ginseng. Overall, there was a small number of young interviewees and participants in Focus Group 1 that considered a stimulant juice-based soft drink more appealing than the stimulant orange juice concept:

> "You would be associating the juice with the taste [of *Red Bull*] as well, and it would taste like *Benylin*[49]". Interviewee 2.
>
> **"**If you are going to make a healthy drink then wouldn't it be better to put in the natural ingredients. I'd prefer the vitamins, minerals and herbal extracts rather than sugar and caffeine". Interviewee 7.

8.8 The High Pressure Processing[50] of Functional Beverages: A Customer Perspective

This research sought to explore customers' views and attitudes towards a range of functional orange juice beverages manufactured using high pressure processing. The vast majority of interviewees and focus group participants were unaware that thermal processing extended the shelf life of 'made from concentrate' and 'not from concentrate' orange juice. Instead, the majority of customers believed that preservatives extended the shelf life of 'made from concentrate' and 'not from concentrate' orange juice. The vast majority of interviewees and focus group participants were positive towards the concept of high pressure processing once the associated benefits were outlined to them. Interestingly, a number of interviewees and participants across focus groups suggested that juice manufacturers that used high pressure processing should communicate the use of thermal processing by rival juice manufacturers to customers:

[49] *Benylin* is an antitussive (cough suppressant) syrup manufactured by Pfizer Consumer Healthcare (Mintel, 2001b).
[50] High pressure processing is a novel non-thermal food processing technique that uses pressure in the region of 50-800MPa to provide safe and minimally processed foods. Specifically, high pressure processing affords beverage manufacturers the opportunity to launch innovative juices with longer shelf lives, and with superior organoleptic and nutritional properties (Beresford and Lane, 2000).

"People will believe that it [high pressure processing] will keep the vitamins in it [the juice]. When they heat the juice it has to lose some of the vitamins". Focus Group 2.

8.9 Participant Questionnaire

The majority of interviewees and focus group participants were regular customers of orange juice, and consumed orange juice either '*once per day*' or '*two to four times per week*'. Orange juice was purchased most frequently in the local supermarket, and less frequently in local convenience stores or in shops at petrol stations. Focus group discussants and interviewees then rated a selection of new functional orange juice concepts for preference using a nine-point Likert scale. The probiotic orange juice concept was most preferred by interviewees, and discussants across focus groups. Customers ranked benefits to both the immune and digestive systems more highly than other health benefits associated with probiotic foods and beverages. The majority of customers in Focus Groups 2 and 3 disliked the stimulant orange juice concept.

8.10 Summary

In this chapter the results of fifteen in-depth interviews and three focus groups were presented. The qualitative enquiries identified the most important attributes that influenced purchasers' preferences for orange juice. The vast majority of interviewees and focus group participants most preferred the probiotic and nutrient-enriched orange juice concepts. However, a number of interviewees and participants in Focus Group 1 appeared receptive towards a stimulant juice-based soft drink. In summary, subsequent quantitative studies focused specifically on chilled functional orange juices and chilled functional soft drinks. This was based upon customers' postive perceptions of chilled orange juice, and chilled beverages generally. Chapter 9 presents the results of a quantitative study investigating customers' preferences for a range of chilled nutrient-enriched orange juice beverages.

Chapter 9: Results: Chilled Nutrient-enriched Orange Juice Beverage Study

9.1 Introduction

This chapter presents the results and analysis of a quantitative study investigating customers' preferences for a range of chilled nutrient-enriched orange juice beverages. The data was gathered using a conjoint-based customer survey, which was administered in Cork and Dublin between May and September 2004. The results and analysis in this chapter is divided into four main sections: participant profile; individual level conjoint analysis; individual level k-means cluster analysis; and the group level simulation analysis. An overall summary of the key findings arising from this survey is then presented.

9.2 Participant Profile

Four hundred purchasers of chilled orange juice completed the conjoint-based survey conducted in Cork and Dublin between May and September 2004. The participant profile is outlined in Table 9.2.1. An analysis of the socio-demographic variables of the survey sample revealed that 44.5 per cent of respondents were male and 55.5 per cent of respondents were female. The age of the respondents ranged from 18 to over 75 years with the majority of respondents (68%) aged less than forty years. The vast majority of respondents were also either single (31.5%) or married (46.5%). Eighty-seven per cent of respondents had completed their Leaving Certificate state examination, and 56 per cent of respondents had completed further studies. Not surprisingly, therefore, the ABC1 social class groupings accounted for over 69 per cent of the total sample, although all social class groupings were represented in this study (See Table 9.2.1). However, as Seymour-Cooke (2001) and Mintel (1998) noted, chilled orange juice consumption remained biased towards the higher social class groups. The vast majority of respondents appeared to be in the pre-family lifestyle stage (See Table 9.2.1). Urban and county or rural respondents were well represented, and respondents from both administered centres, Cork and Dublin, were equally represented in this study.

Table 9.2.1 Participant Socio-demographic Profile

Socio-Demographic Variable	Category	Sample (N)	Sample (%)
Gender	Male	178	44.5
	Female	222	55.5
Age Group (years)	18-24	52	13.0
	25-29	48	12.0
	30-34	66	16.5
	35-39	106	26.5
	40-44	12	3.0
	45-49	28	7.0
	50-54	34	8.5
	55-59	20	5.0
	60-64	20	5.0
	65-69	8	2.0
	70-74	0	0.0
	75+	6	1.5
Marital Status	Single	126	31.5
	Married	186	46.5
	Separated/Divorced	46	11.5
	Cohabiting	26	6.5
	Widowed	16	4.0
Educational Status	No Formal Education	8	2.0
	Primary Level	12	3.0
	Intermediate/Junior Cert.	32	8.0
	Leaving Cert.	68	17.0
	Pursuing Further Education	56	14.0
	Completed Further Education	224	56.0
Employment Status	Employed Full Time	222	55.5
	Employed Part Time	36	9.0
	Self Employed	20	5.0
	Unemployed	0	0.0
	Disability Allowance	8	2.0
	Training Scheme	2	0.5
	Unpaid Work in the Home	22	5.5
	Retired	22	5.5
	Student	68	17.0
	Other	0	0.0

Table 9.2.1 Participant Socio-demographic Profile (Contd.)

Socio-Demographic Variable	Category	Sample (N)	Sample (%)
Social Class	A	42	10.5
	B	130	32.5
	C1	106	26.5
	C2	70	17.5
	D	42	10.5
	E	10	2.5
Household Income (€)	≤€99	12	3.0
	€100-199	14	3.5
	€200-299	36	9.0
	€300-399	14	3.5
	€400-499	24	6.0
	€500-599	20	5.0
	€600-699	32	8.0
	€700-799	14	3.5
	€800-899	18	4.5
	€900-999	12	3.0
	≥€1000	24	6.0
	Decline to Answer	180	45.0
Incomes per Household	Single Income	208	52.0
	Dual Income	148	37.0
	Multiple Incomes	44	11.0
No. Children (≤17 yrs)	None	282	70.5
	1 Child	64	16.0
	2 Children	36	9.0
	More than Two Children	18	4.5
No. Children (≥18 yrs)	None	318	79.5
	1 Child	34	8.5
	2 Children	20	5.0
	More than Two Children	28	7.0
Area of Residence	City (Urban)	152	38.0
	City (Suburban)	104	26.0
	County	144	36.0
Survey Administration	Cork	200	50.0
	Dublin	200	50.0

9.3 Individual Level Conjoint Analysis

This study revealed that purchasers of chilled orange juice were most influenced by price and added ingredients (See Figure 9.3.1). Both price and added ingredients recorded averaged attribute importance values of 26.14 (out of 100) and 20.90 (out of 100) respectively. The flavour (17.96 out of 100) and the type of juice (17.78 out of 100) attributes were also deemed important by respondents when they purchased chilled orange juice. In this study the texture (10.63 out of 100) and brand (6.58 out of 100) attributes appeared least important to purchasers of chilled orange juice (See

Table 9.3.1). The Pearson's R and Kendall's tau association values were used to assess the validity of the conjoint analysis model, at both individual and aggregate levels, in order to determine the strength of the relationship between the product rating scores and the predicted utilities derived from the conjoint model. Larger absolute values for both Pearson's R and Kendall's tau would indicate stronger relationships. The Pearson's R (0.984) and Kendall's tau (0.883) values were high and indicated strong agreement between the averaged product ratings and the predicted utilities from the conjoint analysis model (See Table 9.3.1).

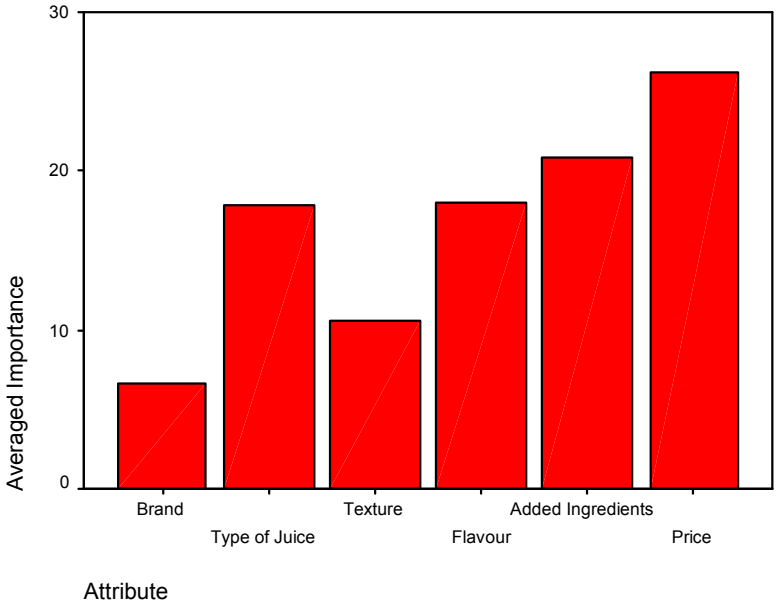


Figure 9.3.1 The Averaged Attribute Importance Summary of the Individual Level Conjoint Analysis

9.3.1 The Averaged Utility Values of the Individual Level Conjoint Analysis

Further analysis of the summary utility values helped explain purchasers' preferences for alternatives within attributes. Overall, low (€1.90 per litre) and medium (€2.80 per litre) priced chilled orange juice elicited positive utility values of 0.7321 and 0.0990 respectively. The €3.70 per litre price level yielded a negative utility value of –0.8310. In this study, a utility reversal summary showed that 194 purchasers of chilled orange juice exhibited some form of price reversal, which was reflected in their individual utility estimates. Previous conjoint-based studies showed that price often formed inter-attribute relationships with other attributes. Specifically, interactions between price and other factors, and intangible factors in particular such as perceived quality, have

been previously observed and studied (SPSS, 2001). The significance of these price reversals in the context of market segmentation is discussed in Section 9.4.

Table 9.3.1 Summary of the Individual Level Conjoint Analysis

Averaged Importance (Out of 100)	Attribute	Attribute Level	Utility[51]
6.58	Brand	Familiar Brand	*-0.1259*
		New Brand	**0.1259**
17.78	Type of Juice	Freshly Squeezed	**0.4988**
		Not from Concentrate	-0.1856
		Made from Concentrate	*-0.3131*
10.63	Texture	Contains Fruity Bits	**0.0859**
		Smooth Style	*-0.0859*
17.96	Flavour	Tangy, Sharp, Slightly Bitter	*-0.4013*
		Slightly Sweet	-0.0581
		Sweet	**0.4594**
20.90	Added Ingredients	None	*-0.5846*
		Calcium	0.2223
		Protein, Calcium, Vitamins and Other Minerals	**0.3623**
26.14	Price	€1.90 per Litre	**0.7321**
		€2.80 per Litre	0.0990
		€3.70 per Litre	*-0.8310*

Constant = 4.8616

Pearson's R = 0.984	Significance = 0.0000
Kendall's tau = 0.883	Significance = 0.0000
Kendall's tau = 1.000 for 4 holdouts	Significance = 0.0208

Purchasers perceived value from the addition of functional ingredients to chilled orange juice. The addition of calcium, and the addition of calcium, protein, vitamins and other minerals, yielded positive utility values of 0.2223 and 0.3623 respectively (See Table 9.3.1). It appeared that for this beverage category at least, multi-

[51] In Table 9.3.1 the highest utility values are in **bold** and the lowest utility values are in *italic.*

functionality, in terms of the addition of several rather than singular functional ingredients, added value from the purchaser's perspective. Overall, purchasers of chilled orange juice preferred sweet flavoured chilled orange juice (0.4594) to either slightly sweet (-0.0581) or tangy, sharp slightly bitter flavoured chilled orange juice (-0.4013). Customers considered the type of juice important when they purchased chilled orange juice and purchasers' perceptions of chilled orange juice changed according to the type of juice chosen. Purchasers of chilled orange juice held positive perceptions of freshly squeezed orange juice, which was indicated by a positive utility score of 0.4988. Interestingly, from a marketing perspective, the 'not from concentrate' chilled orange juice, of which *Tropicana* is the market leader in Ireland, was negatively perceived by purchasers of chilled orange juice (-0.1856). Purchasers of chilled orange juice least liked 'made from concentrate' chilled orange juice.

Overall, the utility values for the texture attribute levels were low, although purchasers preferred chilled orange juice with fruit bits (0.0859) more than smooth style chilled orange juice. Finally, brand was considered the least important of the six attributes taken into account when they purchased chilled orange juice, although purchasers of chilled orange juice were receptive towards new chilled orange juice brands (0.1259). In general, the individual level conjoint analysis procedure in SPSS identified price, added ingredients, flavour and type of juice as the most important attributes that influenced purchasers' preferences for new chilled orange juice beverages. The next stage of the analysis involved a k-means cluster analysis of purchasers' attribute level utility values to identify potential market segments for new chilled nutrient-enriched orange juice beverages.

9.4 Individual Level K-means Cluster Analysis

K-means cluster analysis pre-determined that five clusters of purchasers existed with similar preferences for chilled orange juice (See Table 9.4.1). The market segmentation typology, characterised in terms of socio-demographic, attitudinal, and purchase preference variables, for each cluster, is presented over a number of tables (See Table 9.4.2 to Table 9.4.4). Significant relationships were found between cluster membership and a number of these variables, which for segmentation purposes, helped further distinguish between clusters (See Table 9.4.2 to Table 9.4.4). Overall, four of the five clusters identified were receptive towards experimentation with new chilled

orange juice brands. Furthermore, it appeared that purchasers of chilled orange juice had distinct preferences for either freshly squeezed or 'made from concentrate' chilled orange juice. Interestingly, three of the five clusters (Clusters 1, 2 and 4) held negative perceptions of 'not from concentrate' chilled orange juice (See Table 9.4.1). Clusters 1 and 5, which were the two largest segments, preferred chilled orange juice that contained fruity bits. Clusters 2, 3 and 4 preferred sweet flavoured chilled orange juice. Clusters 1, 2, 4 and 5 preferred functional chilled orange juice to regular chilled orange juice. However, Cluster 2 was receptive towards calcium-enriched chilled orange juice only (See Table 9.4.1). Cluster 3 preferred to purchase regular chilled orange juice. The majority of purchasers of chilled orange juice preferred low priced (€1.90 per litre) chilled orange juice with the exception being Cluster 2, which preferred medium priced (€2.80 per litre) chilled orange juice. Clusters 1 and 5 were the most price sensitive segments across clusters based on the utility values assigned to the respective price attribute levels.

Attribute Preferences and Typology for Cluster 1

Cluster 1, the second largest segment, contained one hundred and ten purchasers of chilled orange juice. This cluster gave the highest utility value for added ingredients across clusters, and therefore, could be considered functionality driven in terms of its purchase preferences (See Table 9.4.1). Cluster 1 most preferred chilled orange juice that contained the same quantity of protein, calcium, vitamins and minerals as an equivalent glass of milk. However, this cluster was also positive towards calcium-enriched chilled orange juice. The price attribute was important to this cluster of purchasers of chilled orange juice. Purchasers gave negative utility values for both medium priced (€2.80 per litre) (-0.10) and high priced (€3.70 per litre) (-0.41) chilled orange juice. The type of juice was also important to this cluster in terms of its purchase preferences. Cluster 1 most preferred freshly squeezed chilled orange juice and least preferred 'not from concentrate' and 'made from concentrate' chilled orange juice in that order (See Table 9.4.1). This cluster preferred chilled orange juice that contained fruity bits with a tangy, sharp and slightly bitter flavour. Brand was the least important attribute to Cluster 1. This cluster of purchasers gave the lowest utility value for brand across clusters although Cluster 1 was receptive towards new chilled orange juice brands.

Table 9.4.1 Averaged Attribute Utilities by Cluster

Attribute Level	Cluster 1 (Utility[52])	Cluster 2 (Utility)	Cluster 3 (Utility)	Cluster 4 (Utility)	Cluster 5 (Utility)
Familiar Brand	*-0.02*	*-0.34*	*-0.23*	**0.05**	*-0.03*
New Brand	**0.02**	**0.34**	**0.23**	*-0.05*	**0.03**
Freshly Squeezed	**0.46**	0.25	**1.11**	0.10	**0.50**
Not from Concentrate	-0.15	*-0.80*	0.44	*-0.65*	0.02
Made from Concentrate	*-0.31*	**0.55**	*-1.55*	**0.56**	*-0.53*
Contains Fruity Bits	**0.15**	*-0.04*	*-0.10*	*-2.39*	**0.43**
Smooth Style	*-0.15*	**0.04**	**0.10**	**2.39**	*-0.43*
Tangy, Sharp, Slightly Bitter	**0.14**	*-1.37*	-0.17	*-0.29*	*-0.25*
Slightly Sweet	*-0.14*	-0.13	*-0.28*	-0.21	**0.17**
Sweet	0.00	**1.49**	**0.45**	**0.50**	0.08
None	*-1.49*	*-0.44*	**0.12**	-0.04	*-0.27*
Calcium	0.59	**0.49**	*-0.14*	*-0.15*	-0.11
Protein, Calcium, Vitamins and Other Minerals	**0.90**	-0.05	0.02	**0.19**	**0.38**
€1.90 per Litre	**0.52**	-0.08	**0.31**	**0.43**	**1.73**
€2.80 per Litre	-0.10	**0.45**	0.08	0.18	0.01
€3.70 per Litre	*-0.41*	*-0.37*	*-0.39*	*-0.61*	*-1.74*
Cluster Size	**110**	**96**	**54**	**12**	**128**

Cluster 1 had a near equal balance of male (50.9%) to female (49.1%) purchasers of chilled orange juice (See Table 9.4.2). The age profile of Cluster 1 ranged from 18 to 69 years of age. However, membership of Cluster 1 appeared biased towards purchasers between 25 to 39 (43.6%) and 50 to 54 (18.2%) years of age. Cluster 1 also contained the highest proportion of chilled orange juice purchasers between 60 and 69 (14.6%) years of age across clusters. The majority of respondents in Cluster 1 were either single (23.6%) or married (56.4%). This cluster, which expressed the highest preference for functional chilled orange juice, also had the highest proportion of respondents that completed third level education (70.9%) across clusters.

[52] In Table 9.4.1 the highest utility values are in **bold** and the lowest utility values are in *italic*.

Table 9.4.2 Socio-demographic Profiles by Cluster

Socio-Demographics	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Gender					
Male	50.9%	33.3%	44.4%	-	51.6%
Female	49.1%	66.7%	55.6%	100%	48.4%
Age Group (years)**					
18-24	5.5%	8.3%	18.5%	-	21.9%
25-29	14.5%	8.3%	22.2%	-	9.4%
30-34	12.7%	20.8%	7.4%	16.7%	20.3%
35-39	16.4%	45.8%	25.9%	16.7%	21.9%
40-44	3.6%	-	3.7%	-	4.7%
45-49	7.3%	8.3%	11.1%	-	4.7%
50-54	18.2%	-	7.4%	16.7%	6.3%
55-59	7.3%	-	3.7%	33.3%	4.7%
60-64	9.1%	8.3%	-	-	1.6%
65-69	5.5%	-	-	-	1.6%
70-74	-	-	-	-	-
75+	-	-	-	16.7%	3.1%
Marital Status					
Single	23.6%	25.0%	22.2%	16.7%	48.4%
Married	56.4%	66.7%	59.3%	16.7%	20.3%
Separated/Divorced	10.9%	8.3%	-	16.7%	18.8%
Cohabiting	1.8%	-	18.5%	-	10.9%
Widowed	7.3%	-	-	50%	1.6%
Educational Status*					
No Formal Education	1.8%	-	-	-	4.7%
Primary Level	1.8%	-	14.8%	16.7%	-
Intermediate/Junior Cert.	10.9%	8.3%	7.4%	33.3%	3.1%
Leaving Cert.	5.5%	25.0%	7.4%	50.0%	21.9%
Pursuing Further Edu.	9.1%	8.3%	29.6%	-	17.2%
Completed Further Edu.	70.9%	58.3%	40.7%	-	53.1%
Employment Status**					
Employed Full Time	60.0%	72.9%	51.9%	33.3%	42.2%
Employed Part Time	9.1%	-	14.8%	16.7%	12.5%
Self Employed	7.3%	-	-	-	9.4%
Unemployed	-	-	-	-	-
Disability Allowance	-	-	-	-	6.3%
Training Scheme	-	-	-	-	1.6%
Unpaid Work in the Home	1.8%	16.7%	7.4%	-	-
Retired	9.1%	-	3.7%	50.0%	3.1%
Student	12.7%	10.4%	22.2%	-	25.0%

* Significant at $p \leq 0.05$

** Significant at $p \leq 0.001$

Table 9.4.2 Socio-demographic Profiles by Cluster (Contd.)

Socio-Demographics	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Social Class					
A	10.9%	8.3%	14.8%	16.7%	9.4%
B	34.5%	39.6%	25.9%	33.3%	28.1%
C1	23.6%	27.1%	37.0%	-	26.6%
C2	16.4%	25.0%	7.4%	16.7%	17.2%
D	12.7%	-	14.8%	33.3%	12.5%
E	1.8%	-	-	-	6.3%
Household Income (€)**					
≤€99	1.8%	-	-	-	7.8%
€100-199	1.8%	-	-	-	9.4%
€200-299	9.1%	8.3%	3.7%	-	12.5%
€300-399	3.6%	-	7.4%	-	4.7%
€400-499	7.3%	-	11.1%	-	7.8%
€500-599	1.8%	8.3%	3.7%	-	6.3%
€600-699	5.5%	-	25.9%	16.7%	7.8%
€700-799	5.5%	-	-	-	6.3%
€800-899	1.8%	8.3%	3.7%	-	4.7%
€900-999	5.5%	-	3.7%	-	3.1%
≥€1000	1.8%	18.8%	3.7%	16.7%	-
Decline to Answer	54.5%	56.3%	37.0%	66.7%	29.7%
Incomes per Household*					
Single Income	49.1%	43.8%	51.9%	66.7%	59.4%
Dual Income	38.2%	39.6%	48.1%	33.3%	29.7%
Multiple Incomes	12.7%	16.7%	-	-	10.9%
No. Children (≤17 yrs) **					
None	69.1%	45.8%	59.3%	83.3%	93.8%
1 Child	21.8%	29.2%	14.8%	-	3.1%
2 Children	7.3%	8.3%	25.9%	16.7%	3.1%
More than Two Children	1.8%	16.7%	-	-	-
No. Children (≥18 yrs)**					
None	67.3%	75.0%	92.6%	83.3%	87.5%
1 Child	10.9%	16.7%	-	16.7%	3.1%
2 Children	9.1%	8.3%	3.7%	-	-
More than Two Children	12.7%	-	3.7%	-	9.4%
Area of Residence					
City (Urban)	27.3%	54.2%	51.9%	-	32.8%
City (Suburban)	38.2%	16.7%	11.1%	33.3%	28.1%
County	34.5%	29.2%	37.0%	66.7%	39.1%
Survey Administration					
Cork	34.5%	79.2%	51.9%	-	45.3%
Dublin	65.5%	20.8%	48.1%	100%	54.7%

* Significant at p≤0.05

** Significant at p≤0.001

This cluster also contained the second highest percentage of retired respondents (9.1%) across clusters. All social class groupings were represented in Cluster 1 (See Table 9.4.2). However, it appeared that membership of this cluster was skewed

towards the B (34.5%) and C1 (23.6%) social class groups. The majority of respondents in Cluster 1 were in single (49.1%) or dual income (38.2%) households. Almost 22 per cent of respondents in Cluster 1 had one child dependant less than 17 years of age (See Table 9.4.2). Cluster 1 had the highest proportion of suburban dwellers across clusters and almost two thirds of respondents in this group completed the survey in Dublin City or County.

Table 9.4.3 presents purchasers' consumption and behavioural profiles by cluster membership for both chilled orange juice and fruit juice. Over half (52.7%) of respondents in Cluster 1 purchased between 1 and 2 litres of chilled orange juice weekly, and the vast majority (96.4%) of them purchased chilled orange juice from grocery multiples. It appeared that respondents in Cluster 1 were also heavy consumers of chilled orange juice where 21.8 per cent and 43.6 per cent of them consumed chilled orange juice more than once per day and once per day respectively. Furthermore, over eighty-seven per cent of respondents in Cluster 1 claimed to either 'always' or 'sometimes' drink chilled orange juice with a meal. Interestingly, the vast majority of respondents in this cluster reportedly purchased either one of the four leading brands on the Irish chilled orange juice market, with all four brands classified as either 'made from concentrate' (43.6%) or 'not from concentrate' (38.8%) chilled orange juice. In the case of Cluster 1 at least, this suggested that respondents' present purchase behaviour did not influence their purchase preferences for new chilled orange juices. Furthermore, while over thirty-eight per cent of respondents in Cluster 1 claimed to purchase *Tropicana*, only sixteen per cent of Cluster 1 claimed to purchase 'not from concentrate' chilled orange juice (See Table 9.4.3). From a marketing perspective, this possibly indicated a high level of confusion concerning purchasers' understanding of both freshly squeezed and 'not from concentrate' chilled orange juice, and similar findings were reported elsewhere (Sorenson and Bogue, 2005; Mintel, 1998).

Respondents were questioned concerning their purchase behaviour towards functional fruit juices on the Irish market. Interestingly, Cluster 1, the functional driven segment, contained the highest proportion (60%) of purchasers of functional juice across clusters. This segment also contained the highest proportion of households with more than 2 children aged 18 years and over, and a significant relationship ($p \leq 0.05$) was

observed between the number of children aged 18 years and over in the household and functional fruit juice purchase behaviour. Cluster 1 also contained the highest percentage of purchasers of both functional fruit juice and dietary supplements, and a significant relationship ($p \leq 0.001$) was also observed.

Table 9.4.3 Chilled Orange Juice Purchase Behaviour and Consumption Profiles by Cluster

Purchase Behaviour and Consumption Category	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Quantity Purchased					
< 1 Litre per Week	29.1%	8.3%	33.3%	-	32.8%
1-2 Litres per Week	52.7%	50.0%	29.6%	50.0%	51.6%
2-3 Litres per Week	3.6%	33.3%	14.8%	33.3%	4.7%
> 3 Litres per Week	14.5%	8.3%	22.2%	16.7%	10.9%
Place of Purchase*					
Grocery Multiples	96.4%	91.7%	66.7%	100%	89.1%
Independent Grocers	1.8%	-	-	-	10.9%
Petrol Station Forecourt	-	-	11.1%	-	-
Vending Machine	-	-	3.7%	-	-
Other	1.8%	8.3%	18.5%	-	-
Package Size Purchased**					
2 Litre	12.7%	8.3%	25.9%	16.7%	3.1%
1.75 Litre	1.8%	8.3%	-	-	-
1 Litre	85.5%	83.3%	51.9%	83.3%	82.8%
1 Pint	-	-	11.1%	-	7.8%
500ml	-	-	7.4%	-	3.1%
330ml	-	-	-	-	1.6%
250ml	-	-	3.7%	-	1.6%
Other	-	-	-	-	-
Brand Purchased**					
Sqeez	20.0%	-	7.4%	33.3%	10.9%
Dawn	21.8%	8.3%	3.7%	33.3%	17.2%
Tropicana	38.8%	20.8%	44.4%	33.3%	18.8%
Fruice	1.8%	-	-	-	1.6%
Private Label	7.3%	43.8%	18.5%	-	20.3%
Sunshine Juice	-	10.4%	-	-	3.1%
CMP	-	16.7%	7.4%	-	12.5%
Other	10.9%	-	18.5%	-	15.6%
Type of Juice Purchased					
Made From Concentrate	29.1%	27.1%	3.7%	33.3%	21.9%
Not From Concentrate	16.4%	20.8%	33.3%	16.7%	28.1%
Freshly Squeezed	41.8%	35.4%	59.3%	16.7%	31.3%
Hybrid Blend	-	8.3%	3.7%	-	10.9%
Unsure/Don't Know	12.7%	8.3%	-	33.3%	7.8%

* Significant at $p \leq 0.05$

** Significant at $p \leq 0.001$

Table 9.4.3 Chilled Orange Juice Purchase Behaviour and Consumption Profiles by Cluster (Contd.)

Purchase Behaviour and Consumption Category	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Functional Fruit Juice Purchased**					
Yes	60.0%	52.1%	44.4%	33.3%	39.1%
No	40.0%	47.9%	55.6%	66.7%	60.9%
Functional Fruit Juice Brand Purchased (n=194)					
Sqeez with Calcium	24.2%	-	8.3%	-	28.0%
Tropicana with Calcium	27.3%	-	8.3%	50.0%	16.0%
Tropicana Multivitamins	18.2%	16.0%	25.0%	-	16.0%
Weser Gold ACE	-	-	-	-	-
Weser Gold Multivitamin	-	-	-	-	-
Kelkin Multivitamin	12.1%	16.0%	8.3%	-	4.0%
Other	18.2%	68.0%	50.0%	50.0%	36.0%
Consumption Frequency					
More than Once per Day	21.8%	12.5%	25.9%	50.0%	15.6%
Once per Day	43.6%	41.7%	22.2%	33.3%	31.3%
4-6 Times per Week	-	29.2%	22.2%	-	23.4%
2-3 Times per Week	18.2%	8.3%	22.2%	16.7%	20.3%
Once per Week	5.5%	-	7.4%	-	1.6%
Rarely	10.9%	8.3%	-	-	6.3%
Never	-	-	-	-	1.6%
Place of Consumption (n=398)**					
At Home	96.4%	100%	70.4%	100%	84.1%
Restaurant/Café/Pub	-	-	3.7%	-	-
On-the-go	-	-	7.4%	-	-
At Work	3.6%	-	18.5%	-	15.9%
Consumed with a Meal (n=398)**					
Always	49.1%	37.5%	48.1%	66.7%	20.6%
Sometimes	38.2%	45.8%	18.5%	16.7%	57.1%
Rarely	1.8%	-	18.5%	-	6.3%
Never	10.9%	16.7%	14.8%	16.7%	15.9%
Meal Occasion (n=340)					
Breakfast	81.6%	80.0%	69.6%	100%	75.5%
Lunch	12.2%	10.0%	4.3%	-	5.7%
Dinner	6.1%	10.0%	26.1%	-	18.9%

* Significant at $p \leq 0.05$

** Significant at $p \leq 0.001$

Respondents in Cluster 1 were considered infrequent consumers of yoghurt-based products. In contrast, Cluster 1 contained the highest percentage of dietary supplement consumers across segments. This segment also contained the highest proportion of

respondents that rarely or never consumed milk on its own (See Table 9.4.4). A significant relationship ($p \leq 0.001$) was found between frequency of milk consumption on its own and dietary supplement consumption, and similar findings have been reported elsewhere. For example, Ulrich *et al*. (1996) observed a negative correlation between liquid milk consumption and dietary supplement consumption. Furthermore, Cluster 1 gave the highest rating for personal concern regarding calcium consumption (6.18 out of 9) and a significant relationship ($p \leq 0.001$) was observed between personal concern regarding calcium consumption and dietary supplement consumption (See Table 9.4.4).

Attribute Preferences and Typology for Cluster 2

Cluster 2 contained ninety-six purchasers of chilled orange juice and exhibited different preferences to Cluster 1. Specifically, Cluster 2 considered the flavour attribute most important when evaluating alternative chilled orange juices, and this cluster gave the highest utility value for flavour across clusters (See Table 9.4.1). This cluster most liked sweet flavoured chilled orange juice (1.49) and least liked the slightly sweet (-0.13) and tangy, sharp, slightly bitter (-1.37) flavour descriptors. This cluster also placed a greater emphasis on the type of juice than Cluster 1 when evaluating chilled orange juice. Cluster 2 most preferred 'made from concentrate' chilled orange juice. This cluster was also receptive towards freshly squeezed chilled orange juice although the utility value (0.25) was lower than for 'made from concentrate' chilled orange juice (0.55). However, respondents in Cluster 2 least liked 'not from concentrate' chilled orange juice (-0.80). Functionality, in terms of added ingredients, was also important to this cluster of purchasers although it was not as important as flavour or the type of juice. Interestingly, enrichment of chilled orange juice with additional nutrients beyond calcium fortification did not add value for this cluster of purchasers of chilled orange juice (See Table 9.4.1). Specifically, this cluster preferred calcium-enrichment only (0.49). In contrast, Cluster 1 members disliked chilled orange juice with a similar nutritional profile to milk (-0.05), and similar findings were reported elsewhere (Sorenson and Bogue, 2005). Surprisingly, this cluster perceived the price attribute differently to the other four clusters. For example, Cluster 2 gave negative utility scores for both the low priced (€1.90 per litre) (–0.08) and high priced (€3.70 per litre) (–0.37) chilled orange juices. Instead, this cluster preferred, or appeared to gain greater assurance from, the medium priced (€2.80 per

litre) (0.45) chilled orange juice (See Table 9.4.1). Membership of Cluster 2 was skewed towards females who represented 66.7 per cent of that cluster. The age profile of Cluster 2 was biased towards the younger age groups. Specifically, 83.4 per cent of respondents in this cluster were aged 39 years or less.

Table 9.4.4 Lifestyle, and Dairy or Non-dairy Consumption Profiles by Cluster

Behavioural Category	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Dietary Lifestyle					
Non-vegetarian	89.1%	72.9%	85.2%	100%	93.8%
Semi-vegetarian	3.6%	16.7%	7.4%	-	1.6%
Pesco-vegetarian	1.8%	10.4%	-	-	1.6%
Ovo-lacto-vegetarian	-	-	3.7%	-	1.6%
Lacto-vegetarian	-	-	-	-	-
Ovo-vegetarian	-	-	-	-	-
Vegan	5.5%	-	-	-	-
Other	-	-	3.7%	-	1.6%
Vegetarian within Household					
Yes	25.5%	27.1%	7.4%	-	15.6%
No	70.9%	64.6%	85.2%	83.3%	84.4%
Not Applicable	3.6%	8.3%	7.4%	16.7%	-
Milk Consumption*					
More than Once per Day	65.5%	33.3%	48.1%	66.7%	42.2%
Once per Day	23.6%	47.9%	14.8%	33.3%	37.5%
4-6 Times per Week	-	10.4%	-	-	12.5%
2-3 Times per Week	-	-	14.8%	-	1.6%
Once per Week	-	-	-	-	-
Rarely	1.8%	-	3.7%	-	4.7%
Never	9.1%	8.3%	18.5%	-	1.6%
Flavoured Milk Consumption					
More than Once per Day	1.8%	-	-	-	-
Once per Day	-	-	18.5%	-	14.1%
4-6 Times per Week	-	-	-	-	-
2-3 Times per Week	7.3%	-	-	-	3.1%
Once per Week	-	16.7%	-	-	-
Rarely	16.4%	41.7%	14.8%	16.7%	10.9%
Never	74.5%	41.7%	66.7%	83.3%	71.9%
Pot Yoghurt Consumption					
More than Once per Day	1.8%	-	-	-	3.1%
Once per Day	16.4%	25.0%	14.8%	33.3%	15.6%
4-6 Times per Week	3.6%	8.3%	22.2%	-	3.1%
2-3 Times per Week	20.0%	39.6%	3.7%	33.3%	28.1%
Once per Week	10.9%	10.4%	18.5%	-	7.8%
Rarely	18.2%	-	11.1%	-	17.2%
Never	29.1%	16.7%	29.6%	33.3%	25.0%

* Significant at $p \leq 0.05$

Table 9.4.4 Lifestyle, and Dairy or Non-dairy Consumption Profiles by Cluster (Contd.)

Behavioural Category	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Yoghurt Drink Consumption					
More than Once per Day	3.6%	-	-	-	1.6%
Once per Day	7.3%	16.7%	11.1%	-	10.9%
4-6 Times per Week	5.5%	8.3%	3.7%	-	3.1%
2-3 Times per Week	3.6%	12.5%	3.7%	-	3.1%
Once per Week	10.9%	10.4%	18.5%	-	1.6%
Rarely	21.8%	35.4%	25.9%	-	35.9%
Never	47.3%	16.7%	37.0%	100%	43.8%
Yoghurt Smoothie Consumption					
More than Once per Day	-	-	-	-	-
Once per Day	-	-	3.7%	-	4.7%
4-6 Times per Week	-	-	18.5%	-	-
2-3 Times per Week	1.8%	-	-	-	-
Once per Week	3.6%	10.4%	-	-	-
Rarely	34.5%	10.4%	29.6%	16.7%	25.0%
Never	60.0%	79.2%	48.1%	83.3%	70.3%
Butter/Spread Consumption**					
More than Once per Day	25.5%	25.0%	40.7%	33.3%	43.8%
Once per Day	20.0%	33.3%	18.5%	50.0%	25.0%
4-6 Times per Week	5.5%	-	14.8%	-	4.7%
2-3 Times per Week	36.4%	18.8%	14.8%	16.7%	7.8%
Once per Week	3.6%	10.4%	7.4%	-	4.7%
Rarely	7.3%	-	-	-	9.4%
Never	1.8%	12.5%	3.7%	-	4.7%
Cheese Consumption*					
More than Once per Day	3.6%	-	7.4%	33.3%	21.9%
Once per Day	12.7%	8.3%	33.3%	16.7%	10.9%
4-6 Times per Week	9.1%	27.1%	7.4%	-	18.8%
2-3 Times per Week	34.5%	27.1%	14.8%	-	12.5%
Once per Week	18.2%	8.3%	7.4%	16.7%	12.5%
Rarely	20.0%	20.8%	7.4%	-	4.7%
Never	1.8%	8.3%	22.2%	33.3%	18.8%

* Significant at $p \leq 0.05$

** Significant at $p \leq 0.001$

Table 9.4.4 Lifestyle, and Dairy or Non-dairy Consumption Profiles by Cluster (Contd.)

Behavioural Category	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Cream Consumption*					
More than Once per Day	-	-	-	-	-
Once per Day	-	-	-	-	-
4-6 Times per Week	1.8%	-	-	-	1.6%
2-3 Times per Week	3.6%	-	-	16.7%	1.6%
Once per Week	27.3%	8.3%	40.7%	33.3%	14.1%
Rarely	40.0%	75.0%	25.9%	16.7%	42.2%
Never	27.3%	16.7%	33.3%	33.3%	40.6%
Ice-cream Consumption					
More than Once per Day	-	-	18.5%	-	1.6%
Once per Day	1.8%	8.3%	3.7%	-	-
4-6 Times per Week	1.8%	8.3%	-	-	1.6%
2-3 Times per Week	21.8%	16.7%	3.7%	-	15.6%
Once per Week	18.2%	8.3%	18.5%	50.0%	20.3%
Rarely	45.5%	39.6%	33.3%	33.3%	26.6%
Never	10.9%	18.8%	22.2%	16.7%	34.4%
Milk Consumption on its Own*					
More than Once per Day	10.9%	-	25.9%	-	12.5%
Once per Day	18.2%	41.7%	3.7%	33.3%	21.9%
4-6 Times per Week	1.8%	8.3%	-	-	9.4%
2-3 Times per Week	10.9%	-	14.8%	-	12.5%
Once per Week	3.6%	-	7.4%	-	3.1%
Rarely	10.9%	41.7%	7.4%	-	9.4%
Never	43.6%	8.3%	40.7%	66.7%	31.3%
Milk Consumption in a Hot Beverage					
More than Once per Day	54.5%	39.6%	18.5%	66.7%	51.6%
Once per Day	23.6%	16.7%	25.9%	16.7%	14.1%
4-6 Times per Week	-	8.3%	7.4%	-	6.3%
2-3 Times per Week	-	-	-	-	4.7%
Once per Week	-	8.3%	-	-	-
Rarely	5.5%	18.8%	7.4%	-	6.3%
Never	16.4%	8.3%	40.7%	16.7%	17.2%
Milk Consumption with Breakfast Cereal					
More than Once per Day	9.1%	8.3%	7.4%	-	10.9%
Once per Day	32.7%	54.2%	18.5%	66.7%	43.8%
4-6 Times per Week	5.5%	-	22.2%	-	4.7%
2-3 Times per Week	12.7%	8.3%	11.1%	-	7.8%
Once per Week	1.8%	8.3%	11.1%	-	4.7%
Rarely	3.6%	10.4%	11.1%	16.7%	7.8%
Never	34.5%	10.4%	18.5%	16.7%	20.3%

* Significant at $p \leq 0.05$

Table 9.4.4 Lifestyle, and Dairy or Non-dairy Consumption Profiles by Cluster (Contd.)

Behavioural Category	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Dietary Supplement Consumption*					
Yes	52.7%	50.0%	48.1%	33.3%	35.9%
No	47.3%	50.0%	51.9%	66.7%	64.1%
Dietary Supplement Consumption within Household*					
Yes	50.9%	60.4%	29.6%	16.7%	39.1%
No	34.5%	27.1%	55.6%	50.0%	32.8%
Unsure	3.6%	-	3.7%	-	17.2%
Not Applicable	10.9%	12.5%	11.1%	33.3%	10.9%
Calcium Concern (Mean Score out of 9)**	6.18	5.85	6.44	6.17	5.36
Calcium Concern within Household (Mean Score out of 9)**	6.09	6.31	5.59	5.17	4.86

* Significant at $p \leq 0.05$

** Significant at $p \leq 0.001$

Cluster 2 also contained the highest percentage of both full time employees (72.9%) and housewives (16.7%) across clusters (See Table 9.4.2). Cluster 2 was comprised of respondents from the ABC social class groupings only, with a bias towards the B social class grouping (39.6%). The C1 (27.1%) and C2 (25%) social class groupings were near equally represented in this cluster. Family size was an interesting characteristic that differentiated Cluster 2 from the other four segments. Cluster 2 contained the highest percentage of respondents with one child dependant (29.2%), and more than 2 child dependants (16.7%), aged 17 years or less, and a significant relationship ($p \leq 0.05$) was observed between the number of children aged 17 years or less in the household and dietary supplement consumption.

It was evident from Table 9.4.4 that Cluster 2 members consumed milk with breakfast cereal more frequently and consumed milk with either a hot beverage or on its own less frequently. Interestingly, fifty per cent of respondents in Cluster 2 purportedly took dietary supplements and this cluster also had the highest percentage of respondents that acknowledged a household member took dietary supplements (60.4%). Not surprisingly, Cluster 2 expressed the highest familial concern (6.31 out

of 9) regarding calcium consumption across segments. More so, Cluster 2, which preferred calcium-enriched chilled orange juice only, also contained the second highest percentage (52.1%) of respondents that purchased functional fruit juices across segments, and a significant relationship ($p \leq 0.05$) was found between familial concern regarding calcium consumption and functional juice purchase behaviour.

Attribute Preferences and Typology for Cluster 3

Cluster 3 contained fifty-four purchasers of chilled orange juice. This cluster considered the type of juice attribute most important when evaluating chilled orange juice and gave the highest utility value for type of juice across clusters (See Table 9.4.1). Cluster 3 preferred freshly squeezed chilled orange juice (1.11). In contrast to the previous two segments, this cluster also gave a positive utility value (0.44) for 'not from concentrate' chilled orange juice. However, Cluster 3 disliked 'made from concentrate' chilled orange juice. Cluster 3 preferred sweet flavoured chilled orange juice. This cluster most preferred the low priced (€1.90 per litre) chilled orange juice (0.31). Cluster 3 also gave a positive utility value (0.08) for the medium priced (€2.80 per litre) chilled orange juice although the utility value was low. This cluster least liked the high priced (€3.70 per litre) chilled orange juice. Similar to the previous two segments, Cluster 3 was also receptive towards new chilled orange juice brands. Functionality, in terms of added ingredients, appeared less important to Cluster 3 than to the previous two segments. In fact, Cluster 3 preferred regular chilled orange juice to nutrient-enriched chilled orange juice. Although this cluster did record a positive utility value (0.02) for chilled orange juice that offered most of the nutritional benefits of milk, the utility value was quite low. Both males and females were well represented in Cluster 3 although a slighter higher percentage (55.6%) of cluster members were female. The age profile of this cluster ranged from 18 to 59 years with a bias towards the 18-24 years (18.5%), 25-29 years (22.2%) and 35-39 years (25.9%) age groups, and the majority of respondents in Cluster 3 also belonged to the ABC1 social class groupings (See Table 9.4.2).

Generally, it appeared the majority of respondents in Cluster 3 were light purchasers of chilled orange juice. Specifically, this cluster contained the highest percentage of respondents that purchased less than 1 litre of chilled orange juice per week (33.3%). Over forty-four per cent of respondents in Cluster 3 purchased *Tropicana* and this

cluster recorded a positive utility score (0.44) for 'not from concentrate' chilled orange juice. However, this cluster most preferred freshly squeezed chilled orange juice and over fifty-nine per cent of respondents in Cluster 3 claimed to purchase freshly squeezed chilled orange juice (See Table 9.4.3). Again, this suggested a degree of confusion concerning purchasers' understanding of the descriptors associated with the various types of juice, and especially freshly squeezed chilled orange juice, as discussed previously. Overall, Cluster 3 appeared to consume yoghurt drinks as regularly, and pot yoghurt more regularly, during the week in comparison to the other four clusters (See Table 9.4.4). In contrast, Cluster 3 contained the second highest percentage of respondents that never consumed milk on its own (40.7%). Over fifty-one per cent of respondents in Cluster 3 did not purchase dietary supplements, and significant relationships were found between age ($p \leq 0.001$), education level ($p \leq 0.001$), frequency of liquid milk consumption ($p \leq 0.05$), and dietary supplement behaviour. Cluster 3 also contained the highest percentage (55.6%) of respondents where no household member took dietary supplements. Interestingly, although Cluster 3 preferred regular to functional chilled orange juices, this cluster of respondents expressed the highest personal concern (6.44 out of 9) regarding calcium consumption and significant relationships were observed between dietary supplement behaviour ($p \leq 0.001$), frequency of liquid milk consumption ($p \leq 0.05$), and personal concern regarding calcium consumption. Familial concern (5.59 out of 9) was less important to this segment (See Table 9.4.4).

Attribute Preferences and Typology for Cluster 4

Cluster 4 was the smallest of the five clusters identified and contained twelve purchasers of chilled orange juice. The texture attribute was most important to this cluster of purchasers and Cluster 4 most preferred smooth style chilled orange juice (2.39). The type of juice attribute was also important to Cluster 4 in terms of its purchase preferences. This cluster exhibited similar choice decisions to Cluster 2 in terms of the type of juice preferred. Cluster 4 most liked 'made from concentrate' chilled orange juice (0.56). This cluster also gave a positive utility value (0.10) for freshly squeezed chilled orange juice. However, Cluster 4 least liked 'not from concentrate' chilled orange juice (-0.65). Cluster 4 expressed a preference for sweet flavoured chilled orange juice (0.50). In contrast, this cluster disliked both slightly sweet flavoured (-0.21) and tangy, sharp, slightly bitter flavoured (-0.29) chilled

orange juice (See Table 9.4.1). Cluster 4 most preferred the low priced (€1.90 per litre) chilled orange juice (0.43), and least liked the high priced (€3.70 per litre) chilled orange juice (-0.61). Cluster 4 expressed a preference for chilled orange juice that offered most of the nutritional benefits of milk. In contrast, this cluster gave negative utility scores for both regular (-0.04) and calcium-enriched (-0.15) chilled orange juice.

Cluster 4 was comprised of female respondents only. It was evident from Table 9.4.2 that the age profile of Cluster 4 was biased towards the older age groups. Specifically, two thirds of respondents in Cluster 4 were aged fifty years and older, and the 55 to 59 years age group accounted for one third of all respondents in this cluster. Cluster 4 also contained the highest percentage of respondents educated to primary level (16.7%), Intermediate Certificate level (33.3%) and Leaving Certificate (50%) level only (See Table 9.4.2). Interestingly, Cluster 4 contained the lowest percentage of purchasers of functional fruit juices across segments (See Table 9.4.3), and a significant relationship was found between education level attained ($p \leq 0.05$) and purchase behaviour for functional fruit juices. Furthermore, over two thirds of respondents in Cluster 4 did not purchase dietary supplements and significant relationships were observed between age ($p \leq 0.001$), educational level attained ($p \leq 0.05$), and dietary supplement consumption behaviour.

Attribute Preferences and Typology for Cluster 5

Cluster 5 was the largest segment identified in this study and contained one hundred and twenty-eight purchasers of chilled orange juice. Price was deemed most important to this segment of purchasers. Specifically, this segment's preferences were the most extreme across clusters in terms of the highest (1.73) and lowest (-1.74) utility values recorded for low priced (€1.90 per litre) and high priced (€3.70 per litre) chilled orange juices respectively. Cluster 5 also considered the type of juice important in terms of its purchase preferences. This cluster most preferred freshly squeezed chilled orange juice (0.50) and least liked 'made from concentrate' chilled orange juice (-0.53) (See Table 9.4.1). However, almost sixty per cent of respondents in Cluster 5 claimed to purchase either freshly squeezed or 'not from concentrate' chilled orange juice. However, these results were inconsistent with the brands of chilled orange juice purportedly purchased by them, and once again indicated confusion or a poor

understanding of the differences in the types of juice available on the Irish market (See Table 9.4.3).

Cluster 5 most preferred chilled orange juice that contained fruity bits, and this segment expressed a preference for chilled orange juice that offered most of the nutritional benefits of milk only (0.38). However, this cluster gave negative utility scores for both calcium-enriched (-0.11) and regular (-0.27) chilled orange juice. Cluster 5 most preferred slightly sweet flavoured chilled orange juice (0.17), and least liked tangy, sharp, slightly bitter flavoured chilled orange juice (-0.25). Both males and females were well represented in Cluster 5 although a slighter higher percentage (51.6%) of cluster members were male. The age profile of this cluster also ranged from 18 to 75 years and over with a bias towards the 18-24 years (21.9%), 30-34 years (20.3%) and 35-39 years (21.9%) age groups (See Table 9.4.2), and the majority of respondents in Cluster 5 were pursuing (17.2%) or had completed (53.1%) further education. Respondents in Cluster 5 were relatively heavy consumers of milk, butter or spreads, cheese, milk on it own or in a hot beverage, and milk with breakfast cereal, in comparison to the other four segments (See Table 9.4.4). Not surprisingly, Cluster 5 contained a higher percentage of respondents that did not purchase dietary supplements and a significant relationship was observed between liquid milk consumption ($p \leq 0.001$) and dietary supplement consumption behaviour. Cluster 5 also gave the lowest rating scores for both personal (5.36 out of 9) and familial (4.86 out of 9) concern regarding calcium consumption, and significant relationships ($p \leq 0.05$) were observed with dietary supplement consumption behaviour.

9.5 Group Level Simulation Analysis

The group level simulation analysis procedure in SPSS was used to predict purchasers' preferences for chilled orange juice concepts that were not evaluated in the survey. Overall, a Kendall's tau value of 1 for the four holdouts was obtained which suggested strong agreement between the holdout ratings and the model predictions (See Table 9.3.1). It was therefore possible to analyse purchasers' preferences for alternative chilled orange juice concepts using choice simulators, both maximum and probability (BTL and Logit) modelling, across clusters. These models were used to estimate the market share or value that clusters associated with each hypothetical product included in the simulation analyses. Although the maximum utility model

assumed respondents only chose products with the highest predicted utility score, the probability models assumed respondents rarely made decisions using such precise notions of utility (Hair *et al*., 1998).

The hypothetical chilled nutrient-enriched orange juice beverages (NuEnJ 1 to NuEnJ 4) presented in Table 9.5.1 were generated from an analysis of both the qualitative and quantitative research, and from discussions with the technical partners involved in this project. The competitor chilled orange juices (NuEnJ 5 to NuEnJ 8) were generated by the researcher and represented products presently available on the Irish chilled orange juice market (See Table 9.5.1). The group level simulation analysis across clusters revealed different preferences for chilled orange juice beverages. In Table 9.5.2 the highest preference scores are in bold and the lowest preference scores are in italic. The conjoint models predicted that Clusters 1, 3 and 5 would most prefer the chilled nutrient-enriched orange juice beverage NuEnJ 1, and this corresponded with the maximum utility, BTL and Logit values for these three segments (See Table 9.5.2). This beverage was described in Table 9.5.1 as a new brand of freshly squeezed chilled orange juice that contained fruity bits. The flavour of NuEnJ 1 was described as tangy, sharp and slightly bitter. This beverage contained the same amount of calcium, protein, vitamins and minerals as an equivalent glass of milk and retailed at €2.80 per litre. Clusters 2 and 4 exhibited different preferences for chilled orange juice.

Overall, Clusters 2 and 4 were expected to have a preference for the non-functional chilled orange juice NuEnJ 8 (See Table 9.5.2). NuEnJ 8 was described as a familiar brand of 'made from concentrate' chilled orange juice. NuEnJ 8 was described as a smooth style chilled orange juice with a sweet flavour. This beverage did not contain added nutrients and retailed at €1.90 per litre (See Table 9.5.1). Group level simulation analysis within clusters was then used to identify the optimal combination of product design attributes, for a range of nutrient-enriched chilled orange juice beverages, specifically targeted at each market segment. This provided for a more market-oriented approach to NPD whereby the preferences of each segment were taken into account when optimising the product design formulation.

Table 9.5.1 Chilled Orange Juice Beverages Presented for Group Level Simulation Analysis Across Clusters

Attributes	NuEnJ 1	NuEnJ 2	NuEnJ 3	NuEnJ 4	NuEnJ 5	NuEnJ 6	NuEnJ 7	NuEnJ 8
Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand	Familiar Brand	Familiar Brand
Juice Type	Freshly Squeezed	Freshly Squeezed	Not from Con.	Not from Con.	Freshly Squeezed	Not from Con.	Not from Con.	Made From Con.
Texture	Contains Fruity Bits	Contains Fruity Bits	Smooth Style	Smooth Style	Contains Fruity Bits	Contains Fruity Bits	Smooth Style	Smooth Style
Flavour	Tangy, Sharp, Slightly Bitter	Tangy, Sharp, Slightly Bitter	Sweet	Sweet	Tangy, Sharp, Slightly Bitter	Sweet	Sweet	Sweet
Added Ingredients	Calcium, Protein, Vitamins & Minerals	Calcium	Calcium, Protein, Vitamins & Minerals	Calcium	None	None	Calcium	None
Price	€2.80 per L	€2.80 per L	€3.70 per L	€3.70 per L	€2.80 per L	€2.80 per L	€3.70 per L	€1.90 per L

Table 9.5.2 Group Level Simulation Analysis of Chilled Orange Juice Beverages Across Clusters

Simulation Summary	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Preference Scores (rated from 1 to 9)					
NuEnJ 1	**7.2**	4.1	**5.9**	2.6	**5.6**
NuEnJ 2	6.9	4.6	5.8	*2.2*	5.2
NuEnJ 3	5.8	5.1	5.6	6.6	2.9
NuEnJ 4	5.5	5.7	5.5	6.3	2.4
NuEnJ 5	4.7	*3.0*	5.6	2.4	4.9
NuEnJ 6	*4.0*	4.8	5.5	2.5	4.8
NuEnJ 7	5.5	5.0	5.0	6.4	*2.3*
NuEnJ 8	4.2	**5.7**	*4.0*	**8.7**	5.1
Max. Utility					
NuEnJ 1	100%	0%	100%	0%	100%
NuEnJ 2	0%	0%	0%	0%	0%
NuEnJ 3	0%	0%	0%	0%	0%
NuEnJ 4	0%	0%	0%	0%	0%
NuEnJ 5	0%	0%	0%	0%	0%
NuEnJ 6	0%	0%	0%	0%	0%
NuEnJ 7	0%	0%	0%	0%	0%
NuEnJ 8	0%	100%	0%	100%	0%

Table 9.5.2 Group Level Simulation Analysis of Chilled Orange Juice Beverages Across Clusters (Contd.)

Simulation Summary	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
BTL					
NuEnJ 1	16.39%	10.70%	13.85%	6.83%	17.00%
NuEnJ 2	15.69%	12.13%	13.46%	5.94%	15.54%
NuEnJ 3	13.29%	13.50%	13.12%	17.50%	8.65%
NuEnJ 4	12.59%	14.94%	12.73%	16.61%	7.19%
NuEnJ 5	10.85%	7.89%	13.01%	6.50%	14.88%
NuEnJ 6	9.15%	12.66%	12.90%	6.61%	14.41%
NuEnJ 7	12.51%	13.15%	11.67%	16.89%	7.01%
NuEnJ 8	9.53%	15.02%	9.27%	23.13%	15.33%
Logit					
NuEnJ 1	39.22%	4.80%	19.65%	0.16%	30.79%
NuEnJ 2	28.92%	8.29%	16.63%	0.12%	18.97%
NuEnJ 3	10.12%	13.96%	14.34%	9.13%	1.92%
NuEnJ 4	7.46%	24.13%	12.14%	6.55%	1.18%
NuEnJ 5	3.49%	1.65%	13.69%	0.14%	15.24%
NuEnJ 6	1.66%	10.14%	13.08%	0.15%	13.06%
NuEnJ 7	7.18%	12.20%	7.71%	7.26%	1.11%
NuEnJ 8	1.95%	24.83%	2.75%	76.48%	17.72%

Group Level Simulation Analysis for Cluster 1

The group level simulation analysis within clusters made it possible to identify new functional beverage concepts that could be developed specifically for each cluster in a market-oriented fashion. In Table 9.5.3 the highest preference score is in bold and the lowest preference score is in italic. The conjoint models predicted that Cluster 1 would most prefer the chilled nutrient-enriched orange juice NuEnJ 9 (mean score 7.8 out of 9) (See Table 9.5.3). This beverage was described as a new brand of chilled freshly squeezed orange juice that contained fruity bits with a tangy, sharp and slightly bitter flavour. NuEnJ 9 contained the same amount of protein, calcium, vitamins and minerals as an equivalent glass of milk, and retailed at €1.90 per litre. In contrast, the conjoint models predicted that this segment of purchasers of chilled orange juice would least like the non-functional beverage NuEnJ 15 (mean score 4.7 out of 9).

Table 9.5.3 Group Level Simulation Analysis of Chilled Nutrient-enriched Orange Juice Beverages for Cluster 1

Attributes	NuEnJ 9	NuEnJ 10	NuEnJ 11	NuEnJ 12	NuEnJ 13	NuEnJ 14	NuEnJ 15	NuEnJ 16
Brand	New Brand	New Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand
Juice Type	Freshly Squeezed	Freshly Squeezed	Freshly Squeezed	Freshly Squeezed	Made from Con.	Not from Con.	Freshly Squeezed	Not from Con.
Texture	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Smooth Style
Flavour	Tangy, Sharp, Slightly Bitter	Tangy, Sharp, Slightly Bitter	Tangy, Sharp, Slightly Bitter	Tangy, Sharp, Slightly Bitter	Tangy, Sharp, Slightly Bitter	Tangy, Sharp, Slightly Bitter	Tangy, Sharp, Slightly Bitter	Sweet
Added Ingredients	Calcium, Protein, Vitamins & Minerals	Calcium, Protein, Vitamins & Minerals	Calcium, Protein, Vitamins & Minerals	Calcium	Calcium, Protein, Vitamins & Minerals	Calcium, Protein, Vitamins & Minerals	None	Calcium
Price	€1.90 per L	€2.80 per L	€3.70 per L	€2.80 per L	€1.90 per L	€3.70 per L	€2.80 per L	€3.70 per L
Pref. Score	**7.8**	7.2	6.9	6.9	7.0	6.2	*4.7*	5.5
Max. Utility	100%	0%	0%	0%	0%	0%	0%	0%
BTL	14.93%	13.74%	13.15%	13.15%	13.47%	11.98%	9.10%	10.48%
Logit	31.67%	17.03%	12.50%	12.56%	14.79%	6.81%	1.51%	3.12%

Although NuEnJ 9 yielded the highest predicted preference score for Cluster 1, this new beverage concept was not considered commercially feasible, for a functional chilled freshly squeezed orange juice, owing to its very low (€1.90 per litre) retail price. The group level simulation analysis within clusters allowed trade-offs between product attributes and attribute levels to be studied. For example, an increase in price from €1.90 per litre (NuEnJ 9) to €2.80 per litre (NuEnJ 10) also gave a high predicted preference score (mean score 7.2 out of 9). Although functionality was highly important to this cluster, in terms of purchase preferences, the conjoint models predicted that members of Cluster 1 would make trade-offs between added ingredients, type of juice and price. Specifically, Cluster 1 would be expected to give equal or greater preference to a chilled calcium-enriched orange juice retailing at €2.80 per litre (NuEnJ 12) than a chilled orange juice offering more nutrients retailing at €3.70 per litre (NuEnJ 11), according to the predicted preference scores and probability (BTL and Logit) models (See Table 9.5.3). Furthermore, Cluster 1 would be expected to give a higher preference score for NuEnJ 13 (mean score 7.0 out of 9), a 'made from concentrate' variant of NuEnJ 9, and lower preference scores for chilled nutrient-enriched freshly squeezed orange juices such as NuEnJ 11 (mean score 6.9 out of 9) and NuEnJ 12 (mean score 6.9 out of 9).

Group Level Simulation Analysis for Cluster 2

Cluster 2 exhibited different preferences for chilled nutrient-enriched orange juice to Cluster 1. In Table 9.5.4 the highest preference score is in bold and the lowest preference score is in italic. The conjoint models predicted that Cluster 2 would most prefer the chilled nutrient-enriched orange juice NuEnJ 17 (mean score 7.9 out of 9) (See Table 9.5.4). This beverage was described as a new brand of chilled 'made from concentrate' orange juice. The texture of NuEnJ 17 was described as smooth style with a sweet flavour. NuEnJ 17 contained the same amount of calcium as an equivalent glass of milk, and retailed at €2.80 per litre. The conjoint models predicted that Cluster 2 would least like the chilled non-functional orange juice beverage NuEnJ 22 (mean score 3.0 out of 9) (See Table 9.5.4). The group level simulation analysis within clusters made it possible to study trade-offs between added ingredients, price and type of juice. Interestingly, the addition of further nutrients to the NuEnJ 17 did not add value for this segment of purchasers of chilled orange juice. Specifically, the conjoint models anticipated that NuEnJ 18 would elicit both a lower preference score

Table 9.5.4 Group Level Simulation Analysis of Chilled Nutrient-enriched Orange Juice Beverages for Cluster 2

Attributes	NuEnJ 17	NuEnJ 18	NuEnJ 19	NuEnJ 20	NuEnJ 21	NuEnJ 22	NuEnJ 23	NuEnJ 24
Brand	New Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand	Familiar Brand
Juice Type	Made from Con.	Made from Con.	Freshly Squeezed	Freshly Squeezed	Not from Con.	Freshly Squeezed	Not from Con.	Made from Con.
Texture	Smooth Style	Smooth Style	Smooth Style	Smooth Style	Smooth Style	Contains Fruity Bits	Smooth Style	Smooth Style
Flavour	Sweet	Sweet	Sweet	Sweet	Sweet	Tangy, Sharp, Slightly Bitter	Sweet	Sweet
Added Ingredients	Calcium	Calcium, Protein, Vitamins & Minerals	Calcium	Calcium, Protein, Vitamins & Minerals	Calcium	None	Calcium	Calcium
Price	€2.80 per L	€2.80 per L	€2.80 per L	€2.80 per L	€3.70 per L	€2.80 per L	€3.70 per L	€1.90 per L
Pref. Score	**7.9**	7.3	7.6	7.0	5.7	*3.0*	5.0	6.6
Max. Utility	100%	0%	0%	0%	0%	0%	0%	0%
BTL	15.69%	14.6%	15.10%	14.00%	11.35%	6.00%	9.99%	13.27%
Logit	31.00%	17.94%	22.98%	13.30%	3.53%	0.24%	1.79%	9.21%

(mean score 7.3 out of 9) and a smaller market share than NuEnJ 17 (See Table 9.5.4). It was expected that NuEnJ 19, a freshly squeezed variant of NuEnJ 17, would yield a higher preference score (mean score 7.6 out of 9) than the chilled highly enriched orange juice beverage NuEnJ 18.

Group Level Simulation Analysis for Cluster 3

The conjoint models predicted that Cluster 3 would most prefer the chilled non-functional orange juice NuEnJ 25 (mean score 7.1 out of 9) (See Table 9.5.5). In Table 9.5.5 the highest preference score is in bold and the lowest preference score is in italic. This beverage was described as a new brand of freshly squeezed chilled orange juice with a smooth texture and sweet flavour. NuEnJ 25 did not contain added nutrients and retailed at €1.90 per litre. Although NuEnJ 25 yielded the highest predicted preference score for Cluster 3, this freshly squeezed chilled orange juice was not considered commercially feasible owing to its very low (€1.90 per litre) retail price. However, as functionality did not appear important to this cluster of purchasers, Cluster 3 was also expected to give relatively high preference scores to nutrient-enriched variants such as NuEnJ 27 (mean score 6.8 out of 9) and NuEnJ 26 (mean score 6.6 out of 9). The conjoint analysis revealed that the type of juice primarily influenced Cluster 3 when evaluating alternative chilled orange juices (See Table 9.4.1). Consequently, Cluster 3 would be expected to give a higher preference for NuEnJ 29 (mean score 5.6 out of 9), a functional 'not from concentrate' chilled orange juice retailing at €3.70 per litre, than NuEnJ 28 (mean score 4.2 out of 9), a 'made from concentrate' chilled orange juice retailing at €1.90 per litre (See Table 9.5.5).

Group Level Simulation Analysis for Cluster 4

The conjoint models predicted that Cluster 4 would most prefer the chilled nutrient-enriched orange juice NuEnJ 33 (mean score 8.9 out of 9) (See Table 9.5.6). In Table 9.5.6 the highest preference score is in bold and the lowest preference score is in italic. This beverage was described as a familiar brand of chilled 'made from concentrate' orange juice. The texture of NuEnJ 33 was described as smooth style with a sweet flavour. NuEnJ 33 contained the same amount of protein, calcium, vitamins and minerals as an equivalent glass of milk, and retailed at €1.90 per litre. However, the conjoint analysis revealed that the brand attribute did not exert a strong influence on purchasers' preferences for chilled orange juice (See Table 9.4.1). Consequently, the

Table 9.5.5 Group Level Simulation Analysis of Chilled Nutrient-enriched Orange Juice Beverages for Cluster 3

Attributes	NuEnJ 25	NuEnJ 26	NuEnJ 27	NuEnJ 28	NuEnJ 29	NuEnJ 30	NuEnJ 31	NuEnJ 32
Brand	New Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand	Familiar Brand
Juice Type	Freshly Squeezed	Freshly Squeezed	Freshly Squeezed	Made from Con.	Not from Con.	Not from Con.	Freshly Squeezed	Not from Con.
Texture	Smooth Style	Smooth Style	Smooth Style	Smooth Style	Smooth Style	Smooth Style	Contains Fruity Bits	Smooth Style
Flavour	Sweet	Sweet	Sweet	Sweet	Sweet	Sweet	Tangy, Sharp, Slightly Bitter	Sweet
Added Ingredients	None	Calcium	Calcium, Protein, Vitamins & Minerals	Calcium	Calcium, Protein, Vitamins & Minerals	Calcium	None	None
Price	€1.90 per L	€2.80 per L	€2.80 per L	€1.90 per L	€3.70 per L	€3.70 per L	€2.80 per L	€2.80 per L
Pref. Score	**7.1**	6.6	6.8	*4.2*	5.6	5.0	5.6	5.7
Max. Utility	100%	0%	0%	0%	0%	0%	0%	0%
BTL	15.22%	14.18%	14.53%	8.95%	12.08%	10.75%	11.98%	12.32%
Logit	30.95%	19.03%	22.48%	1.67%	7.17%	3.85%	6.84%	8.01%

Table 9.5.6 Group Level Simulation Analysis of Chilled Nutrient-enriched Orange Juice Beverages for Cluster 4

Attributes	NuEnJ 33	NuEnJ 34	NuEnJ 35	NuEnJ 36	NuEnJ 37	NuEnJ 38	NuEnJ 39	NuEnJ 40
Brand	Familiar Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand	Familiar Brand
Juice Type	Made from Con.	Made from Con.	Made from Con.	Freshly Squeezed	Not from Con.	Freshly Squeezed	Not from Con.	Made from Con.
Texture	Smooth Style	Smooth Style	Smooth Style	Smooth Style	Smooth Style	Contains Fruity Bits	Smooth Style	Smooth Style
Flavour	Sweet	Sweet	Sweet	Sweet	Sweet	Tangy, Sharp, Slightly Bitter	Sweet	Sweet
Added Ingredients	Calcium, Protein, Vitamins & Minerals	Calcium, Protein, Vitamins & Minerals	Calcium	Calcium, Protein, Vitamins & Minerals	Calcium, Protein, Vitamins & Minerals	None	Calcium	Calcium
Price	€1.90 per L	€1.90 per L	€1.90 per L	€2.80 per L	€3.70 per L	€2.80 per L	€3.70 per L	€1.90 per L
Pref. Score	**8.9**	8.8	8.5	8.1	6.6	*2.4*	6.4	8.6
Max. Utility	100%	0%	0%	0%	0%	0%	0%	0%
BTL	15.31%	15.13%	14.56%	13.92%	11.28%	4.19%	10.89%	14.74%
Logit	25.78%	23.23%	16.64%	11.44%	2.45%	0.04%	1.95%	18.47%

simulation analysis within Cluster 4 revealed that this segment would also be receptive towards NuEnJ 34 (mean score 8.8 out of 9), which was a new brand variant of NuEnJ 33. The conjoint models predicted that Cluster 4 would least like the chilled non-functional freshly squeezed orange juice beverage NuEnJ 38 (mean score 2.4 out of 9) (See Table 9.5.6).

Group Level Simulation Analysis for Cluster 5

The conjoint models revealed that Cluster 5 would most prefer the nutrient-enriched chilled orange juice NuEnJ 41 (mean score 7.8 out of 9) (See Table 9.5.7). In Table 9.5.7 the highest preference score is in bold and the lowest preference score is in italic. This beverage was described as a new brand of chilled freshly squeezed orange juice that contained fruity bits with a slightly sweet flavour. NuEnJ 41 contained the same amount of protein, calcium, vitamins and minerals as an equivalent glass of milk, and retailed at €1.90 per litre. However, NuEnJ 41 was not considered commercially feasible, for a chilled functional freshly squeezed orange juice, owing to its very low (€1.90 per litre) retail price. The simulation analysis revealed that an increase in price from €1.90 per litre (NuEnJ 41) to €2.80 per litre (NuEnJ 43) would yield a lower preference score (mean score 6.1 out of 9) for NuEnJ 43. Instead, it was expected that this segment of purchasers would give a higher preference score for NuEnJ 42 (mean score 6.8 out of 9), a 'made from concentrate' variant of NuEnJ 41, owing to the importance that this segment placed on the price attribute (See Table 9.5.7). The conjoint models also predicted that this segment of purchasers of chilled orange juice would least like the chilled calcium-enriched orange juice NuEnJ 46 (mean score 2.3 out of 9).

9.6 Summary

In this chapter the results of a conjoint analysis study that investigated customers' preferences for a range of chilled nutrient-enriched orange juice beverages was presented. This conjoint-based approach to new product design identified the most important product design attributes that influenced purchasers' preferences for new chilled orange juice beverages. Overall, purchasers identified price, added ingredients, flavour and type of juice as the most important attributes that influenced their purchase behaviour towards chilled orange juice. However, cluster analysis identified a number

Table 9.5.7 Group Level Simulation Analysis of Chilled Nutrient-enriched Orange Juice Beverages for Cluster 5

Attributes	NuEnJ 41	NuEnJ 42	NuEnJ 43	NuEnJ 44	NuEnJ 45	NuEnJ 46	NuEnJ 47
Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand	Familiar Brand
Juice Type	Freshly Squeezed	Made from Con.	Freshly Squeezed	Not from Con.	Freshly Squeezed	Not from Con.	Made from Con.
Texture	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Smooth Style	Smooth Style
Flavour	Slightly Sweet	Slightly Sweet	Slightly Sweet	Slightly Sweet	Tangy, Sharp, Slightly Bitter	Sweet	Sweet
Added Ingredients	Calcium, Protein, Vitamins & Minerals	Calcium, Protein, Vitamins & Minerals	Calcium, Protein, Vitamins & Minerals	Calcium, Protein, Vitamins & Minerals	None	Calcium	Calcium
Price	€1.90 per L	€1.90 per L	€2.80 per L	€3.70 per L	€2.80 per L	€3.70 per L	€1.90 per L
Pref. Score	**7.8**	6.8	6.1	3.8	4.9	*2.3*	5.3
Max. Utility	100%	0%	0%	0%	0%	0%	0%
BTL	21.07%	18.29%	16.40%	10.38%	13.37%	6.30%	14.21%
Logit	58.92%	21.09%	10.50%	1.13%	3.43%	0.25%	4.67%

of potential market segments with different preferences for chilled orange juice. Four of the five clusters identified exhibited preferences for chilled nutrient-enriched orange juice, although only one segment of purchasers was deemed functionality driven. Interestingly, from a marketing perspective, and in light of the present trend towards 'premium' chilled orange juice, it appeared that the vast majority of purchasers of chilled orange juice across segments were not receptive towards 'not from concentrate' chilled orange juice. Simulation analyses revealed trade-offs, in terms of key product design attributes, which respondents in each cluster were expected to make, which identified new beverage concepts that could be targeted more effectively at each potential market segment. Chapter 10 presents the results of a conjoint-based study investigating customers' preferences for a range of chilled probiotic orange juice beverages.

Chapter 10: Results: Chilled Probiotic Orange Juice Beverage Study

10.1 Introduction

This chapter presents the results and analysis of a quantitative survey conducted in Cork and Dublin between May and September 2004. This study investigated customers' preferences for a range of chilled probiotic orange juice beverages. The results and analysis in this chapter is divided into four main sections: participant profile; individual level conjoint analysis; individual level k-means cluster analysis; and the group level simulation analysis. A summary of the key findings from this survey is then presented followed by an introduction to the final results chapter (Chapter 11) in Part IV.

10.2 Participant Profile

Four hundred purchasers of chilled orange juice completed a conjoint-based survey that investigated market opportunities for a range of chilled probiotic orange juice beverages. The survey was administered in Cork and Dublin between May and September 2004. The participant profile is outlined in Table 10.2.1. An analysis of the socio-demographic variables of the survey sample revealed that 39 per cent of respondents were male and 61 per cent of respondents were female. The age of the respondents ranged from 18 to over 75 years. The vast majority of respondents were either single (40.5%) or married (45.5%). Eighty-seven per cent of respondents had completed their Leaving Certificate examination, and 52 per cent of respondents had completed further education (See Table 10.2.1). The ABC1 social class groupings accounted for 59.5 per cent of the total sample, although all social class groupings were represented in this study. Respondents from single and dual income households accounted for 53 per cent and 42.5 per cent of the survey sample respectively. The vast majority of respondents were in the pre-family lifestyle stage. For example, 83 per cent of respondents had no children aged 17 year or younger. Furthermore, 68.5 per cent of respondents had no children aged 18 years or over (See Table 10.2.1). Urban and county or rural respondents were well represented in this study. Furthermore, respondents from both administered centres, Cork and Dublin, were equally represented in this study.

Table 10.2.1 Participant Socio-demographic Profile

Socio-Demographic Variable	Category	Sample (N)	Sample (%)
Gender	Male	156	39.0
	Female	244	61.0
Age Group (years)	18-24	68	17.0
	25-29	48	12.0
	30-34	56	14.0
	35-39	20	5.0
	40-44	32	8.0
	45-49	30	7.5
	50-54	54	13.5
	55-59	48	12.0
	60-64	20	5.0
	65-69	14	3.5
	70-74	2	0.5
	75+	8	2.0
Marital Status	Single	162	40.5
	Married	182	45.5
	Separated/Divorced	14	3.5
	Cohabiting	20	5.0
	Widowed	22	5.5
Educational Status	No Formal Education	6	1.5
	Primary Level	8	2.0
	Intermediate/Junior Cert.	38	9.5
	Leaving Cert.	88	22.0
	Pursuing Further Education	52	13.0
	Completed Further Education	208	52.0
Employment Status	Employed Full Time	204	51.0
	Employed Part Time	26	6.5
	Self Employed	16	4.0
	Unemployed	0	0.0
	Disability Allowance	12	3.0
	Training Scheme	0	0.0
	Unpaid Work in the Home	28	7.0
	Retired	38	9.5
	Student	66	16.5
	Other	10	2.5

Table 10.2.1 Participant Socio-demographic Profile (Contd.)

Socio-Demographic Variable	Category	Sample (N)	Sample (%)
Social Class	A	26	6.5
	B	116	29.0
	C1	96	24.0
	C2	92	23.0
	D	60	15.0
	E	10	2.5
Household Income (€)	≤€99	6	1.5
	€100-199	12	3.0
	€200-299	18	4.5
	€300-399	14	3.5
	€400-499	14	3.5
	€500-599	48	12.0
	€600-699	2	0.5
	€700-799	8	2.0
	€800-899	20	5.0
	€900-999	8	2.0
	≥€1000	10	2.5
	Decline to Answer	240	60.0
Incomes per Household	Single Income	212	53.0
	Dual Income	170	42.5
	Multiple Incomes	18	4.5
No. Children (≤17 yrs)	None	332	83.0
	1 Child	42	10.5
	2 Children	26	6.5
	More than Two Children	0	0.0
No. Children (≥18 yrs)	None	274	68.5
	1 Child	52	13.0
	2 Children	48	12.0
	More than Two Children	26	6.5
Area of Residence	City (Urban)	84	21.0
	City (Suburban)	168	42.0
	County	148	37.0
Survey Administration	Cork	200	50.0
	Dublin	200	50.0

10.3 Individual Level Conjoint Analysis

This study revealed that purchasers of chilled orange juice were most influenced by price and the type of juice (See Table 10.3.1). Both price and the type of juice recorded averaged attribute importance values of 29.97 (out of 100) and 19.31 (out of 100) respectively. Furthermore, additional health benefits (18.41 out of 100) and flavour (16.15 out of 100) were important attributes to purchasers of chilled orange juice (See Table 10.3.1). The texture and brand attributes were least important to purchasers of chilled orange juice with averaged attribute importance values of 10.09

Table 10.3.1 Summary of the Individual Level Conjoint Analysis

Averaged Importance (Out of 100)	Attribute	Attribute Level	Utility[53]
6.06	Brand	Familiar Brand	*-0.0281*
		New Brand	**0.0281**
19.31	Type of Juice	Freshly Squeezed	**0.4783**
		Not from Concentrate	-0.0135
		Made from Concentrate	*-0.4648*
10.09	Texture	Contains Fruity Bits	*-0.0031*
		Smooth Style	**0.0031**
16.15	Flavour	Tangy, Sharp, Slightly Bitter	*-0.2767*
		Slightly Sweet	**0.1915**
		Sweet	0.0852
18.41	Health Benefits	None	*-0.4550*
		Aid the Immune System	0.1444
		Aid the Digestive System	**0.3106**
29.97	Price	€1.90 per Litre	**1.0392**
		€2.80 per Litre	0.0104
		€3.70 per Litre	*-1.0496*

Constant = 4.6567

Pearson's R = 0.988 Significance = 0.0000

Kendall's tau = 0.958 Significance = 0.0000

Kendall's tau = 0.667 for 4 holdouts Significance = 0.0871

(out of 100) and 6.06 (out of 100) respectively (See Figure 10.3.1). Pearson's R and Kendall's tau association values were used to assess the validity of the conjoint analysis model, at both individual and aggregate levels, in order to determine the strength of the relationship between the product rating scores and the predicted utilities derived from the conjoint model. The Pearson's R (0.988) and Kendall's tau

[53] In Table 10.3.1 the highest utility values are in **bold** and the lowest utility values are in *italic*.

(0.958) values were high and indicated strong agreement between the averaged product ratings and the predicted utilities from the conjoint analysis model.

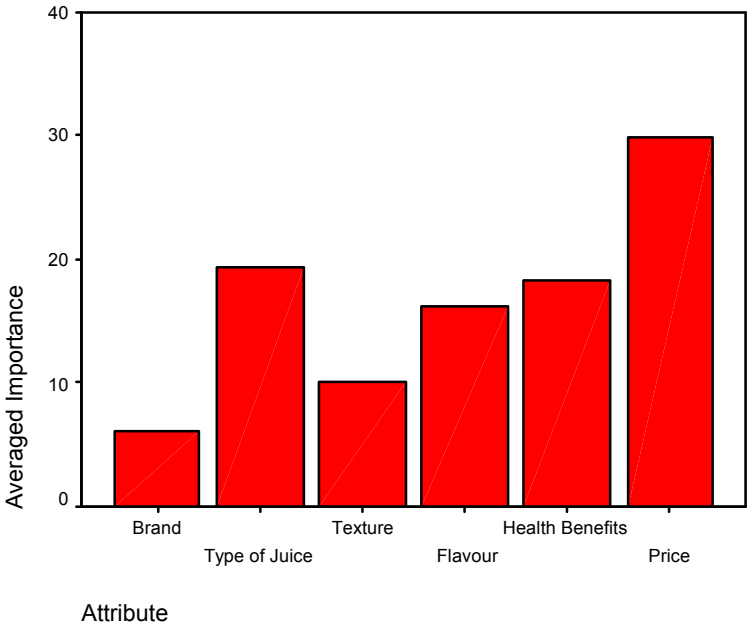


Figure 10.3.1 The Averaged Attribute Importance Summary of the Individual Level Conjoint Analysis

10.3.1 The Averaged Utility Values of the Individual Level Conjoint Analysis

Further analysis of the summary utility values identified purchasers' preferences for alternatives within attributes. Overall, price was considered the most important attribute taken into account when they purchased chilled orange juice. The low price level (€1.90 per litre) elicited the highest utility value (1.0392). The medium price level (€2.80 per litre) also elicited a positive utility value (0.0104) although this positive utility value was low. Overall, purchasers of chilled orange juice disliked high priced chilled orange juice and the €3.70 per litre price level gave a negative utility value of approximately –1.0496. The utility reversal summary showed that 134 purchasers of chilled orange juice exhibited some form of price reversal, which was reflected in their individual utility estimates. The significance of these price reversals in the context of market segmentation is discussed in more detail in Section 10.4. Customers considered the type of juice important when they purchased chilled orange juice and purchasers' perceptions of chilled orange juice changed according to the type of juice chosen. Purchasers of chilled orange juice held positive perceptions of freshly

squeezed chilled orange juice (0.4783). However, the 'not from concentrate' chilled orange juice was negatively perceived by purchasers of chilled orange juice (-0.0135). Purchasers of chilled orange juice least liked 'made from concentrate' chilled orange juice (-0.4648).

Purchasers' perceived value from the addition of functional ingredients to chilled orange juice. Generally, customers preferred a chilled probiotic orange juice that benefited the digestive system (0.3106) rather than a chilled probiotic orange juice that benefited the immune system (0.1444). Overall, purchasers of chilled orange juice preferred slightly sweet flavoured chilled orange juice (0.1915) to either sweet (0.0852) or tangy, sharp, slightly bitter flavoured chilled orange juice (-0.2767). The utility values for the texture attribute levels were low, although smooth style chilled orange juice (0.0031) was more preferred than chilled orange juice with fruity bits by purchasers (-0.0031). Finally, brand was considered the least important of the six attributes taken into account when they purchased chilled orange juice. Overall, this research revealed that purchasers of chilled orange juice were receptive towards new chilled orange juice brands (0.0281). Overall, the individual level conjoint analysis procedure in SPSS identified price, the type of juice, health benefits and flavour as the most important attributes that influenced purchasers' preferences for new chilled orange juice beverages in that order. The next stage of the analysis involved k-means cluster analysis of purchasers' attribute level utility values to identify potential market segments for new chilled probiotic orange juice beverages.

10.4 Individual Level K-means Cluster Analysis

K-means cluster analysis pre-determined that five clusters of purchasers existed with similar preferences for chilled orange juice. The market segmentation typology, characterised in terms of socio-demographic, attitudinal, and purchase preference variables, for each cluster, is presented over a number of tables (See Table 10.4.2 to Table 10.4.4). Significant relationships were found between cluster membership and a number of these variables, which for segmentation purposes, helped further distinguish between clusters (See Table 10.4.2 to Table 10.4.4). Overall, three of the five clusters (Clusters 1, 4 and 5) preferred to purchase a familiar brand of chilled orange juice and were therefore less receptive than Clusters 2 and 3 towards new chilled orange juice brands. Three clusters (Clusters 1, 2 and 4) most liked freshly

squeezed chilled orange juice (See Table 10.4.1). Interestingly, Cluster 3 had an equal preference for both freshly squeezed and 'made from concentrate' chilled orange juice. In contrast, Cluster 5 most preferred 'not from concentrate' chilled orange juice and least liked 'made from concentrate' chilled orange juice. Similar to the previous chilled orange juice study, a number of clusters (Clusters 1, 3 and 4) held negative perceptions of 'not from concentrate' chilled orange juice (See Table 10.4.1). Only one segment, Cluster 1, preferred smooth style chilled orange juice. Clusters 2, 3, 4 and 5 preferred chilled orange juice that contained fruity bits. The majority of purchasers of chilled orange juice preferred either slightly sweet or sweet flavoured chilled orange juice. For example, Clusters 1, 3 and 4 preferred slightly sweet chilled orange juice, while Cluster 2 preferred sweet flavoured chilled orange juice. In contrast, Cluster 5 expressed a preference for tangy, sharp, slightly bitter flavoured chilled orange juice. Clusters 1, 2, 3 and 4 preferred chilled probiotic orange juice beverages to regular chilled orange juice. However, it appeared that the health benefits associated with the digestive system were most preferred by all four clusters (See Table 10.4.1). Only Cluster 5 preferred to purchase regular to functional chilled orange juice. All five clusters preferred low priced (€1.90 per litre) chilled orange juice. It appeared that Clusters 2 and 5 were the most price sensitive segments owing to the negative utility scores for both medium (€2.80 per litre) and high priced (€3.70 per litre) chilled orange juices.

Attribute Preferences and Typology for Cluster 1

Cluster 1, the second largest segment, contained one hundred purchasers of chilled orange juice. This cluster considered the type of juice most important when evaluating chilled orange juice, and this cluster gave the second highest utility value for type of juice across clusters (See Table 10.4.1). Cluster 1 most preferred chilled freshly squeezed orange juice and disliked chilled 'made from concentrate' orange juice. Interestingly, this cluster of purchasers least liked chilled 'not from concentrate' orange juice. Cluster 1 gave the highest utility value for texture across clusters and these respondents could therefore be considered texture driven in terms of their purchase preferences. Cluster 1 most preferred smooth style chilled orange juice. Functionality, expressed in terms of the potential health benefits offered by the addition of probiotic cultures and selected nutrients, was also important to this segment of purchasers. Cluster 1 gave near equal preference to chilled probiotic

orange juice that either aided the immune system or aided the digestive system. Cluster 1 was also the most brand loyal segment identified in this study (See Table 10.4.1). Cluster 1 expressed positive utility values for both low priced (€1.90 per litre) (0.15) and medium priced (€2.80 per litre) (0.09) chilled orange juice. Flavour appeared the least important attribute to this segment of purchasers although respondents in Cluster 1 preferred slightly sweet and sweet flavoured chilled orange juice in that order.

Table 10.4.1 Averaged Attribute Utilities by Cluster

Attribute Level	Cluster 1 (Utility[54])	Cluster 2 (Utility)	Cluster 3 (Utility)	Cluster 4 (Utility)	Cluster 5 (Utility)
Familiar Brand	**0.23**	*-0.16*	*-0.25*	**0.05**	**0.06**
New Brand	*-0.23*	**0.16**	**0.25**	*-0.05*	*-0.06*
Freshly Squeezed	**0.66**	**0.18**	**0.33**	**0.63**	1.03
Not from Concentrate	*-0.51*	0.15	*-0.66*	-0.02	**1.19**
Made from Concentrate	-0.15	*-0.34*	**0.33**	*-0.61*	*-2.22*
Contains Fruity Bits	*-0.63*	**0.27**	**0.14**	**0.06**	**0.21**
Smooth Style	**0.63**	*-0.27*	*-0.14*	*-0.06*	*-0.21*
Tangy, Sharp, Slightly Bitter	*-0.18*	0.05	*-1.96*	*-0.27*	**0.57**
Slightly Sweet	**0.12**	*-0.14*	**1.08**	**0.31**	0.15
Sweet	0.06	**0.09**	0.88	-0.04	*-0.72*
None	*-0.52*	*-0.40*	*-0.34*	*-2.56*	**0.81**
Aid the Immune System	0.25	0.00	0.14	1.18	-0.32
Aid the Digestive System	**0.27**	**0.41**	**0.21**	**1.39**	*-0.48*
€1.90 per Litre	**0.15**	**2.11**	**0.78**	**0.59**	**0.35**
€2.80 per Litre	0.09	-0.18	0.32	0.34	*-0.19*
€3.70 per Litre	*-0.24*	*-1.93*	*-1.10*	*-0.94*	-0.17
Cluster Size	**100**	**148**	**62**	**36**	**54**

Membership of Cluster 1 was skewed towards females who represented 76 per cent of that cluster. The age profile of Cluster 1 ranged from 18 to 59 years. It was evident

[54] In Table 10.4.1 the highest utility values are in **bold** and the lowest utility values are in *italic*.

from Table 10.4.2 that the age profile of Cluster 1 was biased towards respondents in the 18-24 years, 30-34 years, and 55-59 years age groups. Eighty-eight per cent of respondents in Cluster 1 were either single or married. Cluster 1 contained the highest percentage of respondents (38%) that were educated to Leaving Certificate level only. Furthermore, this segment contained the lowest percentage of respondents (32%) across clusters that had completed further education (See Table 10.4.2). Although the majority of purchasers in Cluster 1 were in full time employment, this segment contained a higher percentage of students relative to Clusters 2, 3, and 5. Cluster 1 was comprised of respondents from the BCD social class groupings only with a bias towards the B social class grouping (38%) (See Table 10.4.2). The majority of respondents in Cluster 1 were in either single (48%) or dual income (46%) households. Although the majority of respondents in Cluster 1 were in the pre-family lifestyle stage, this segment contained the highest and second highest percentage of respondents with one child dependant (20%) and 2 child dependants (14%) aged 17 years or less respectively. This cluster also had the highest percentage of households with both one child (20%) and more than 2 children (12%) aged 18 years or over (See Table 10.4.2). The proportion of urban, suburban and county dwellers was near equal in this cluster and 70 per cent of respondents in Cluster 1 completed the survey in Cork City or County.

Cluster 1 contained the highest percentage of respondents that purchased less than 1 litre of chilled orange juice per week (46%) and these respondents were therefore considered light purchasers of chilled orange juice. The majority of respondents in Cluster 1 also consumed chilled orange juice either more than once per day (10%), once per day (56%) or 4 to 6 times per week (20%). This cluster predominantly purchased chilled orange juice from grocery multiple outlets. Interestingly, the percentage of purchasers of 'made from concentrate' chilled orange juice in Cluster 1 was underestimated and the percentage of purchasers of both 'not from concentrate' and freshly squeezed chilled orange juice was overestimated. Specifically, these results were inconsistent with the brands of chilled orange juice purportedly purchased by them, and indicated confusion or a poor understanding of the differences in the types of juice available on the Irish market. Fifty-two per cent of respondents in Cluster 1 claimed to purchase functional fruit juices and the brand leaders (*Sqeez* and

Table 10.4.2 Socio-demographic Profiles by Cluster

Socio-Demographics	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Gender					
Male	24.0%	50.0%	32.3%	61.1%	29.6%
Female	76.0%	50.0%	67.7%	38.9%	70.4%
Age Group (years)					
18-24	22.0%	23.0%	16.1%	5.6%	-
25-29	6.0%	13.5%	9.7%	5.6%	25.9%
30-34	16.0%	13.5%	12.9%	33.3%	-
35-39	-	-	-	33.3%	14.8%
40-44	14.0%	9.5%	-	-	7.4%
45-49	12.0%	5.4%	9.7%	-	7.4%
50-54	10.0%	13.5%	9.7%	-	33.3%
55-59	20.0%	6.8%	16.1%	22.2%	-
60-64	-	8.1%	3.2%	-	11.1%
65-69	-	-	22.6%	-	-
70-74	-	1.4%	-	-	-
75+	-	5.4%	-	-	-
Marital Status					
Single	40.0%	37.8%	54.8%	16.7%	48.1%
Married	48.0%	41.9%	29.0%	83.3%	44.4%
Separated/Divorced	6.0%	2.7%	-	-	7.4%
Cohabiting	6.0%	9.5%	-	-	-
Widowed	-	8.1%	16.1%	-	-
Educational Status**					
No Formal Education	-	4.1%	-	-	-
Primary Level	4.0%	-	6.5%	-	-
Intermediate/Junior Cert.	8.0%	6.8%	6.5%	33.3%	7.4%
Leaving Cert.	38.0%	25.7%	19.4%	-	-
Pursuing Further Edu.	18.0%	13.5%	19.4%	5.6%	-
Completed Further Edu.	32.0%	50.0%	48.4%	61.1%	92.6%
Employment Status*					
Employed Full Time	58.0%	37.8%	35.5%	77.8%	74.1%
Employed Part Time	4.0%	9.5%	12.9%	-	-
Self Employed	-	9.5%	3.2%	-	-
Unemployed	-	-	-	-	-
Disability Allowance	2.0%	6.8%	-	-	-
Unpaid Work in the Home	4.0%	12.2%	6.5%	-	3.7%
Retired	4.0%	6.8%	22.6%	-	18.5%
Student	22.0%	14.9%	19.4%	22.2%	3.7%
Other	6.0%	2.7%	-	-	-

* Significant at $p \leq 0.05$

** Significant at $p \leq 0.001$

Table 10.4.2 Socio-demographic Profiles by Cluster (Contd.)

Socio-Demographics	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Social Class**					
A	-	12.2%	-	11.1%	7.4%
B	38.0%	17.6%	12.9%	27.8%	63.0%
C1	22.0%	28.4%	22.6%	44.4%	3.7%
C2	18.0%	17.6%	51.6%	16.7%	18.5%
D	22.0%	17.6%	12.9%	-	7.4%
E	-	6.8%	-	-	-
Household Income (€)					
≤€99	2.0%	1.4%	-	5.6%	-
€100-199	-	4.1%	6.5%	5.6%	-
€200-299	6.0%	1.4%	16.1%	-	-
€300-399	4.0%	2.7%	-	5.6%	7.4%
€400-499	10.0%	2.7%	-	-	-
€500-599	16.0%	4.1%	35.5%	-	7.4%
€600-699	2.0%	-	-	-	-
€700-799	4.0%	2.7%	-	-	-
€800-899	8.0%	-	-	33.3%	-
€900-999	-	1.4%	-	16.7%	-
≥€1000	-	5.4%	3.2%	-	-
Decline to Answer	48.0%	74.3%	38.7%	33.3%	85.2%
Incomes per Household					
Single Income	48.0%	62.2%	45.2%	38.9%	55.6%
Dual Income	46.0%	33.8%	54.8%	44.4%	44.4%
Multiple Incomes	6.0%	4.1%	-	16.7%	-
No. Children (≤17 yrs)**					
None	66.0%	86.5%	93.5%	72.2%	100%
1 Child	20.0%	12.2%	6.5%	-	-
2 Children	14.0%	1.4%	-	27.8%	-
No. Children (≥18 yrs)*					
None	64.0%	68.9%	61.3%	77.8%	77.8%
1 Child	20.0%	8.1%	16.1%	-	18.5%
2 Children	4.0%	18.9%	12.9%	16.7%	3.7%
More than Two Children	12.0%	4.1%	9.7%	5.6%	-
Area of Residence					
City (Urban)	30.0%	18.9%	9.7%	38.9%	11.1%
City (Suburban)	36.0%	33.8%	71.0%	50.0%	37.0%
County	34.0%	47.3%	19.4%	11.1%	51.9%
Survey Administration					
Cork	70.0%	39.2%	61.3%	72.2%	14.8%
Dublin	30.0%	60.8%	38.7%	27.8%	85.2%

* Significant at p≤0.05

** Significant at p≤0.001

Tropicana) accounted for 50 per cent of chilled functional fruit juices purchased by them (See Table 10.4.3). It was evident from Table 10.4.4 that the penetration of probiotic products, in terms of purchase behaviour, varied across product categories.

Table 10.4.3 Chilled Orange Juice Purchase Behaviour and Consumption Profiles by Cluster

Purchase Behaviour and Consumption Category	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Quantity Purchased*					
< 1 Litre per Week	46.0%	16.2%	32.3%	38.9%	14.8%
1-2 Litres per Week	36.0%	48.6%	51.6%	44.4%	40.7%
2-3 Litres per Week	10.0%	16.2%	16.1%	16.7%	44.4%
> 3 Litres per Week	8.0%	18.9%	-	-	-
Place of Purchase					
Grocery Multiples	92.0%	93.2%	87.1%	100%	88.9%
Independent Grocers	6.0%	4.1%	12.9%	-	11.1%
Petrol Station Forecourt	-	-	-	-	-
Vending Machine	-	2.7%	-	-	-
Other	2.0%	-	-	-	-
Pack Size Purchased**					
2 Litre	14.0%	13.5%	-	-	-
1.75 Litre	10.0%	-	-	-	-
1 Litre	64.0%	77.0%	71.0%	83.3%	85.2%
1 Pint	10.0%	1.4%	29.0%	-	-
500ml	-	5.4%	-	-	14.8%
330ml	-	-	-	-	-
250ml	2.0%	2.7%	-	16.7%	-
Other	-	-	-	-	-
Brand Purchased					
Sqeez	14.0%	14.9%	25.8%	5.6%	-
Dawn	24.0%	17.6%	16.1%	22.2%	14.8%
Tropicana	12.0%	28.4%	9.7%	33.3%	59.3%
Fruice	4.0%	1.4%	3.2%	-	-
Private Label	30.0%	31.1%	3.2%	-	22.2%
Sunshine Juice	4.0%	-	-	16.7%	-
CMP	2.0%	2.7%	16.1%	-	3.7%
Other	10.0%	4.1%	25.8%	22.2%	-
Type of Juice Purchased					
Made From Concentrate	20.0%	40.5%	16.1%	33.3%	7.4%
Not From Concentrate	14.0%	16.2%	9.7%	5.6%	48.1%
Freshly Squeezed	30.0%	20.3%	29.0%	55.6%	22.2%
Hybrid Blend	14.0%	1.4%	3.2%	-	-
Unsure/Don't Know	22.0%	21.6%	41.9%	5.6%	22.2%

* Significant at $p \leq 0.05$

** Significant at $p \leq 0.001$

Table 10.4.3 Chilled Orange Juice Purchase Behaviour and Consumption Profiles by Cluster (Contd.)

Purchase Behaviour and Consumption Category	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Functional Fruit Juice Purchased					
Yes	52.0%	18.9%	64.5%	88.9%	11.1%
No	48.0%	81.1%	35.5%	11.1%	88.9%
Functional Fruit Juice Brand Purchased (n=158)					
Sqeez with Calcium	30.8%	21.4%	25.0%	6.3%	-
Tropicana with Calcium	11.5%	7.1%	-	-	-
Tropicana Multivitamins	7.7%	28.6%	10.0%	31.3%	100%
Weser Gold ACE	-	-	-	-	-
Weser Gold Multivitamin	-	-	-	18.8%	-
Kelkin Multivitamin	19.2%	-	5.0%	-	-
Other	30.8%	42.9%	60.0%	43.8%	-
Consumption Frequency					
More than Once per Day	10.0%	17.6%	22.6%	11.1%	7.4%
Once per Day	56.0%	40.5%	45.2%	61.1%	59.3%
4-6 Times per Week	20.0%	13.5%	-	11.1%	7.4%
2-3 Times per Week	6.0%	13.5%	3.2%	-	7.4%
Once per Week	4.0%	9.5%	12.9%	16.7%	18.5%
Rarely	4.0%	5.4%	16.1%	-	-
Never	-	-	-	-	-
Place of Consumption					
At Home	88.0%	91.9%	83.9%	83.3%	96.3%
Restaurant/Café/Pub	4.0%	1.4%	-	-	-
On-the-go	4.0%	1.4%	12.9%	16.7%	3.7%
At Work	-	5.4%	3.2%	-	-
Other	4.0%	-	-	-	-
Consumed with a Meal**					
Always	48.0%	52.7%	35.5%	38.9%	96.3%
Sometimes	34.0%	20.3%	16.1%	61.1%	-
Rarely	6.0%	6.8%	38.7%	-	3.7%
Never	12.0%	20.3%	9.7%	-	-
Meal Occasion* (n=352)					
Breakfast	97.7%	86.4%	100%	100%	100%
Lunch	-	8.5%	-	-	-
Dinner	2.3%	5.1%	-	-	-

* Significant at $p \leq 0.05$

** Significant at $p \leq 0.001$

Table 10.4.4 Probiotic Food, Beverage and Supplement Purchase Behaviour Profiles by Cluster

	Cluster 1 %	Cluster 2 %	Cluster 3 %	Cluster 4 %	Cluster 5 %
Probiotic Yoghurt Purchased					
Yes	64.0%	66.2%	32.3%	61.1%	85.2%
No	36.0%	33.8%	67.7%	38.9%	14.8%
Probiotic Yoghurt Brand Purchased (n=250)					
Benecol Low Fat Bio	9.4%	16.3%	-	-	-
Dale Farm Spelga Light	-	-	-	-	-
Danone Actimel	12.5%	8.2%	20.0%	63.6%	-
Danone Bio Activia	46.9%	10.2%	-	-	47.8%
Irish Yoghurts Bioactive	-	-	-	9.1%	13.0%
Glenisk Organic Probiotic	12.5%	30.6%	10.0%	18.2%	21.7%
Private Label Bio	9.4%	-	-	-	-
Yeo Valley Bio	-	4.1%	-	-	-
Onken Bio Pot	-	-	-	-	-
Sno Fit 4 Life	-	14.3%	-	9.1%	-
Yoplait 0%	-	12.2%	20.0%	-	8.7%
Yoplait Bioplus	-	2.0%	-	-	8.7%
Danone Shape	-	-	30.0%	-	-
Muller Vitality	-	-	10.0%	-	-
Other	9.4%	2.0%	10.0%	-	-
Probiotic Smoothie Purchased					
Yes	26.0%	5.4%	6.5%	61.1%	-
No	74.0%	94.6%	93.5%	38.9%	100%
Probiotic Smoothie Brand Purchased (n=60)					
Innocant Thickie	53.8%	100%	-	9.1%	-
PJ Mooothie	38.5%	-	-	9.1%	-
Wild Orchard Bio	-	-	-	18.2%	-
Other	7.7%	-	100%	63.6%	-
Probiotic Supplement Purchased*					
Yes	38.0%	10.8%	29.0%	44.4%	-
No	62.0%	89.2%	71.0%	55.6%	100%

* Significant at $p \leq 0.05$

Table 10.4.4 Probiotic Food, Beverage and Supplement Purchase Behaviour Profiles by Cluster (Contd.)

	Cluster 1 %	Cluster 2 %	Cluster 3 %	Cluster 4 %	Cluster 5 %
Probiotic Milk Purchased					
Yes	28.0%	6.8%	32.3%	72.2%	-
No	72.0%	93.2%	67.7%	27.8%	100%
Probiotic Milk Brand Purchased (n=84)					
CMP Bio Milk	50.0%	80.0%	-	7.7%	-
Avonmore Bio Milk	-	-	-	-	-
Other	50.0%	20.0%	100%	92.3%	-
Probiotic Yoghurt Drinks Purchased**					
Yes	72.0%	52.7%	51.6%	66.7%	11.1%
No	28.0%	47.3%	48.4%	33.3%	88.9%
Probiotic Yoghurt Drinks Brand Purchased (n=212)					
Danone Actimel	83.3%	92.3%	81.3%	83.3%	-
Danone Shape Bio	11.1%	-	-	-	-
Danone Gervais	-	-	-	-	-
Glenisk Probiotic Live	2.8%	-	-	-	33.3%
Muller Vitality	-	-	-	-	-
Yakult	-	-	-	-	-
Yoplait Everybody	-	7.7%	12.5%	8.3%	66.7%
Other	2.8%	-	6.3%	8.3%	-

** Significant at p≤0.001

For example, Cluster 1 contained the highest percentage of purchasers of probiotic yoghurt drinks (72%) across clusters, and over 83 per cent of these respondents purchased Groupe Danone's *Actimel* probiotic yoghurt drink. Significant relationships were found between age (p≤0.001), the number of children aged 17 years or less (p≤0.001), and probiotic yoghurt drink purchase behaviour. The majority of respondents in Cluster 1 also purchased probiotic yoghurts (64%) such as Groupe Danone's *Bio Activia* (46.9%), Groupe Danone's *Actimel* (12.5%), and Glenisk's *Organic Probiotic Yoghurt* (12.5%), and significant relationships were observed between educational level attained (p≤0.001), the number of children aged 18 years or over (p≤0.05), and probiotic yoghurt purchase behaviour. In contrast, the vast majority of respondents in Cluster 1 did not purchase probiotic milk (72%), probiotic smoothies (74%) or probiotic supplements (62%) (See Table 10.4.4).

Attribute Preferences and Typology for Cluster 2

Cluster 2 expressed different preferences to Cluster 1 for chilled orange juice. Cluster 2 was the largest segment identified in this study and contained 148 purchasers of chilled orange juice. Cluster 2 appeared the most price sensitive segment across clusters. Specifically, this segment recorded the highest (2.11) and lowest (-1.93) utility values for low priced (€1.90 per litre) and high priced (€3.70 per litre) chilled orange juices respectively. The medium priced (€2.80 per litre) chilled orange juice also elicited a negative utility score (-0.18). The health benefit attribute was also important to this segment of purchasers. Cluster 2 preferred probiotic chilled orange juice to regular chilled orange juice. Cluster 2 most preferred probiotic chilled orange juice that aided the digestive system (0.41). In contrast, the proposed health benefits to the immune system were not of interest to this segment of purchasers (See Table 10.4.1). The texture attribute also appeared important to this segment of purchasers. Cluster 2 preferred chilled orange juice that contained fruity bits. The type of juice, brand and flavour attributes appeared less important to this segment of purchasers of chilled orange juice (See Table 10.4.1). Cluster 2 preferred chilled freshly squeezed orange juice although, unlike Cluster 1, this segment gave a positive utility score for chilled 'not from concentrate' orange juice. However, Cluster 2 contained the highest percentage of purchasers of 'made from concentrate' orange juice (40.5%) across clusters (See Table 10.4.3).

Cluster 2 contained an equal proportion of male to female respondents. The age profile of this segment ranged from 18 to 75 years and over, and this cluster contained the highest percentage of respondents across clusters aged between 18-24 years (23%), and 50 per cent of respondents in Cluster 2 had completed further education. All social class groupings were represented in Cluster 2 (See Table 10.4.2). Although this cluster contained the highest percentage of respondents from the A social class group across segments, membership of this cluster was skewed towards the C1 social class group. Over 86 per cent of respondents in this segment had no children under the age of 17 years, although Cluster 2 did contain the highest percentage of respondents with two children aged 18 years or over (18.9%).

Respondents in Cluster 2 were heavy purchasers of chilled orange juice relative to the other four clusters. Specifically, this cluster had the highest percentage of respondents

across clusters that purchased more than 3 litres of chilled orange juice per week (18.9%), and had the second highest percentage of respondents that purchased 2 litre cartons (13.5%) (See Table 10.4.3). Although respondents in Cluster 2 considered functionality important in terms of influencing their purchase decision for chilled orange juice, this cluster primarily purchased regular chilled orange juice (See Table 10.4.3). Similar to Cluster 1, probiotic yoghurts and probiotic yoghurt drinks were most popular with respondents in Cluster 2 (See Table 10.4.4). Almost two thirds of respondents in Cluster 2 purchased probiotic yoghurts and significant relationships were observed between age ($p \leq 0.001$), the number of children aged 17 years or less ($p \leq 0.001$), and probiotic yoghurt purchase behaviour. Over fifty-two per cent of respondents in this segment purchased probiotic yoghurt drinks and over ninty-two per cent of these purchasers bought Groupe Danone's *Actimel*. Significant relationships were also observed between educational level attained ($p \leq 0.001$), the number of children aged 17 years or less ($p \leq 0.001$), the number of children aged 18 years or over ($p \leq 0.05$), and probiotic yoghurt drink purchase behaviour. In contrast, the vast majority of respondents in Cluster 2 did not purchase probiotic milk, probiotic supplements or probiotic smoothies (See Table 10.4.4).

Attribute Preferences and Typology for Cluster 3

Cluster 3 contained 62 purchasers of chilled orange juice and this segment expressed different preferences to Clusters 1 and 2 for chilled orange juice. Cluster 3 considered the flavour attribute most important when evaluating chilled orange juice and this cluster gave the highest utility value for flavour across clusters (See Table 10.4.1). This cluster most preferred slightly sweet flavoured chilled orange juice (1.08). This cluster also gave a positive utility value for sweet flavoured chilled orange juice (0.88). However, Cluster 3 least liked tangy, sharp, slightly bitter flavoured chilled orange juice (-1.96). Similar to Cluster 2, this segment of purchasers also considered price important when choosing between different chilled orange juices. Cluster 3 most liked low priced (€1.90 per litre) chilled orange juice (0.78). However, unlike Cluster 2, this segment also gave a positive utility score for medium priced (€2.80 per litre) chilled orange juice (0.32). This cluster also considered the type of juice important when evaluating chilled orange juice. Interestingly, Cluster 3 expressed an equal preference for both chilled freshly squeezed and 'made from concentrate' orange juice. In contrast, chilled 'not from concentrate' orange juice was least liked by this cluster

of purchasers (-0.66). Functionality was not as important to this segment of purchasers as it was to Clusters 1 and 2. However, Cluster 3 most preferred a probiotic chilled orange juice that aided the digestive system. This segment of purchasers also gave a positive utility value for a chilled probiotic orange juice that aided the immune system (0.14). Cluster 3 gave the highest utility value for brand across clusters, and appeared the most receptive segment towards new chilled orange juice brands. Texture appeared the least important attribute to Cluster 3 although this segment expressed a preference for chilled orange juice that contained fruity bits.

Membership of Cluster 3 was biased towards females who represented 67.7 per cent of that cluster. It was evident from Table 10.4.2 that Cluster 3 was composed of both younger and older age groups. Specifically, membership of Cluster 3 was biased towards the 18-24 years (16.1%), 30-34 years (12.9%), 55-59 years (16.1%) and 65-69 years (22.6%) age groups. Not surprisingly therefore, Cluster 3 contained the highest percentage of single (54.8%), widowed (16.1%) and retired (22.6%) respondents across clusters. The educational status profile of Cluster 3 was relatively similar to that of Cluster 1. Over forty-eight per cent of respondents in Cluster 3 had completed further education, and this segment was comprised of respondents from the BCD social class groupings, with a bias towards the C1 (22.6%) and C2 (51.6%) social class groupings (See Table 10.4.2).

The majority of respondents in Cluster 3 purchased more than 1 litre of chilled orange juice per week, and over fifty-one per cent of respondents in Cluster 3 purchased the leading chilled orange juice brands on the Irish market (See Table 10.4.3). This cluster also contained the highest percentage of respondents that consumed chilled orange juice more than once per day (22.6%) across clusters (See Table 10.4.3). Interestingly, it appeared that this cluster underestimated its consumption of 'made from concentrate' chilled orange juice, although respondents in this cluster did acknowledge uncertainty (41.9%) as to the type of chilled orange juice primarily purchased by them. It also appeared that Cluster 3's purchase behaviour for probiotic products varied across product categories as was seen with Clusters 1 and 2 (See Table 10.4.4). Over fifty-one per cent of respondents in Cluster 3 purchased probiotic yoghurt drinks and Group Danone's *Actimel* (81.3%) in particular, and significant relationships were observed between gender ($p \leq 0.001$), educational level attained ($p \leq 0.001$), age

($p \leq 0.05$), marital status ($p \leq 0.05$), and probiotic yoghurt drink purchase behaviour. In contrast, this segment contained the lowest percentage of purchasers of probiotic yoghurts (32.3%) across clusters (See Table 10.4.4). Furthermore, the vast majority of respondents in Cluster 3 did not purchase probiotic smoothies (93.5%), probiotic supplements (71%) or probiotic milk (67.7%) (See Table 10.4.4).

Attribute Preferences and Typology for Cluster 4

Cluster 4 contained thirty-six purchasers of chilled orange juice. This cluster gave the highest utility value for the health benefit attribute across clusters, and was therefore functionality driven in terms of its purchase preferences (See Table 10.4.1). Cluster 4 most preferred chilled probiotic orange juice that aided the digestive system (1.39), although this segment also gave a positive utility value for chilled probiotic orange juice that aided the immune system (1.18). The type of juice was also highly important to this cluster in terms of its purchase preferences. Cluster 4 most preferred chilled freshly squeezed orange juice and least preferred chilled 'made from concentrate' orange juice (See Table 10.4.1). The price attribute was important to this cluster of purchasers of chilled orange juice. Similar to Clusters 1 and 3, this segment gave positive utility values for both low priced (€1.90 per litre) (0.59) and medium priced (€2.80 per litre) (0.34) chilled orange juice.

The socio-demographic profile of Cluster 4 was skewed towards males who represented 61.1 per cent of that cluster (See Table 10.4.2). The age profile of Cluster 4 ranged from 18 to 59 years with a bias towards the 30-39 years (66.6%) and 55-59 (22.2%) years age groups. Membership of this cluster was also skewed towards respondents that had completed the Intermediate or Junior Certificate examination only (33.3%), and those that had completed further education (61.1%) (See Table 10.4.2). Cluster 4 was comprised of respondents from the ABC social class groupings, with a bias towards the B (27.8%) and C1 (44.4%) social class groupings (See Table 10.4.2). Although the majority of respondents in this cluster were in full-time employment (77.8%), this segment contained the highest percentage of students (22.2%) across clusters. This cluster also contained the highest percentage of respondents with two children aged 17 years or less (27.8%), and over 22 per cent of respondents in Cluster 4 had two or more children aged 18 years or over. Cluster 4 contained the second highest percentage of respondents that purchased less than 1 litre

of chilled orange juice per week (38.9%), and this cluster also contained the highest percentage of respondents that purchased 250ml cartons or bottles (16.7%). Although one third of respondents in this cluster purportedly purchased *Tropicana* chilled orange juice, only 5.6 per cent claimed to purchase chilled 'not from concentrate' orange juice. Furthermore, the percentage of respondents in Cluster 4 that claimed to purchase freshly squeezed chilled orange juice was high. This again suggested confusion amongst purchasers concerning the different types of juices on the Irish market. Interestingly, Cluster 4, which was previously described as the 'functional driven' segment also had the highest percentage (88.9%) of purchasers of functional juices across clusters (See Table 10.4.3). It was interesting to note that Cluster 4, the functional driven segment, contained a high percentage of respondents that purchased probiotic products across categories. For example, this cluster contained the highest percentage of respondents that purchased probiotic milk (72.2%), probiotic smoothies (61.1%) and probiotic supplements (44.4%) (See Table 10.4.4). Significant relationships were observed between age ($p \leq 0.001$), gender ($p \leq 0.001$), educational level attained ($p \leq 0.001$), and purchase behaviour for both probiotic smoothies and probiotic supplements. Furthermore, over 66 per cent and 61 per cent of respondents in Cluster 4 purchased probiotic yoghurt drinks and probiotic yoghurts respectively, and a significant relationship was found between occupation status ($p \leq 0.05$) and purchase behaviour for both probiotic yoghurts and probiotic yoghurt drinks.

Attribute Preferences and Typology for Cluster 5

Cluster 5 contained fifty-four purchasers of chilled orange juice and this segment considered the type of juice attribute most important in terms of its purchase preferences. Cluster 5 most preferred chilled 'not from concentrate' orange juice (1.19), and this cluster also contained the highest percentage of respondents across clusters that claimed to purchase *Tropicana* (59.3%) (See Table 10.4.3). Cluster 5 most preferred regular chilled orange juice (0.81) and clearly held negative perceptions of chilled probiotic orange juice beverages (See Table 10.4.1). Indeed, Cluster 5 contained the lowest percentage of respondents that purchased functional fruit juice (11.1%) (See Table 10.4.3). Furthermore, this cluster did not purchase probiotic milk, probiotic smoothies or probiotic supplements. This segment also contained the lowest percentage of respondents that purchased probiotic yoghurt drinks (11.1%), although Cluster 5 contained the highest percentage of respondents

that purchased probiotic yoghurts (85.2%) (See Table 10.4.4). The flavour attribute was also important to this cluster of purchasers of chilled orange juice. Cluster 5 most liked tangy, sharp, slightly bitter flavoured chilled orange juice (0.57). This segment also gave a positive utility value for slightly sweet flavoured chilled orange juice (0.15). Cluster 5 was most receptive to low priced (€1.90 per litre) (0.35) chilled orange juice and was less receptive to both medium priced (€2.80 per litre) (-0.19) and high priced (€3.70 per litre) (-0.17) chilled orange juice. Membership of Cluster 5 was biased towards females who represented over seventy per cent of that cluster. The age profile of Cluster 5 was skewed towards the 25-29 years (25.9%), 35-39 years (14.8%) and 50-54 years (33.3%) age groups (See Table 10.4.2). Cluster 5 was also comprised of respondents from the ABCD social class groupings, and over 92 per cent of them had completed further education (See Table 10.4.2).

10.5 Group Level Simulation Analysis

Overall, the Kendall's tau value of 0.667 for the four holdouts suggested less than perfect agreement between the holdout ratings and the model predictions although this value was within acceptable limits (See Table 10.3.1) (SPSS, 2001; Tsalikis *et al*., 2001). The hypothetical chilled probiotic orange juice beverages (ProbJu 1 to ProbJu 4) presented in Table 10.5.1 were generated from an analysis of both the qualitative and quantitative research and from discussions with the technical partners involved in this project. The competitor chilled orange juices (ProbJu 5 to ProbJu 8) represented chilled orange juices available on the Irish market (See Table 10.5.1). In Table 10.5.2 the highest preference scores are in bold and the lowest preference scores are in italic. The conjoint models predicted that Clusters 1, 2 and 3 would most prefer the chilled non-functional orange juice ProbJu 8 and this corresponded with the maximum utility, BTL and Logit values for these three segments (See Table 10.5.2). ProbJu 8 was described as a familiar brand of chilled 'made from concentrate' orange juice. This beverage was also characterised by a smooth style texture and sweet flavour. ProbJu 8 did not contain probiotic cultures or other selected ingredients and retailed at €1.90 per litre. Cluster 5 exhibited differing preferences for chilled non-functional orange juice to Clusters 1, 2 and 3. The conjoint models predicted that this segment would most prefer the chilled freshly squeezed orange juice ProbJu 5 (mean score 6.9 out of 9). The simulation analysis across clusters revealed that only one of the five segments, Cluster 4, would most likely purchase a chilled probiotic orange juice. This

Table 10.5.1 Chilled Orange Juice Beverages Presented for Group Level Simulation Analysis Across Clusters

Attributes	ProbJu 1	ProbJu 2	ProbJu 3	ProbJu 4	ProbJu 5	ProbJu 6	ProbJu 7	ProbJu 8
Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand	Familiar Brand	Familiar Brand
Juice Type	Freshly Squeezed	Freshly Squeezed	Not from Con.	Not from Con.	Freshly Squeezed	Not from Con.	Not from Con.	Made From Con.
Texture	Contains Fruity Bits	Contains Fruity Bits	Smooth Style	Smooth Style	Contains Fruity Bits	Contains Fruity Bits	Smooth Style	Smooth Style
Flavour	Tangy, Sharp, Slightly Bitter	Tangy, Sharp, Slightly Bitter	Sweet	Sweet	Tangy, Sharp, Slightly Bitter	Sweet	Sweet	Sweet
Health Benefits	Aid the Digestive System	Aid the Immune System	Aid the Digestive System	Aid the Immune System	None	None	None	None
Price	€2.80 per L	€2.80 per L	€3.70 per L	€3.70 per L	€2.80 per L	€2.80 per L	€2.80 per L	€1.90 per L

Table 10.5.2 Group Level Simulation Analysis of Chilled Orange Juice Beverages Across Clusters

Simulation Summary	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Preference Scores (rated from 1 to 9)					
ProbJu 1	4.7	5.5	3.7	**7.5**	5.5
ProbJu 2	4.7	5.0	3.6	7.3	5.7
ProbJu 3	4.7	3.2	3.9	5.7	4.0
ProbJu 4	4.7	*2.8*	3.8	5.5	4.1
ProbJu 5	4.4	4.3	*2.7*	3.7	**6.9**
ProbJu 6	*3.5*	4.3	4.5	3.3	5.8
ProbJu 7	4.7	3.8	4.2	3.2	5.4
ProbJu 8	**5.2**	**5.6**	**5.7**	*2.8*	*2.5*
Max. Utility					
ProbJu 1	0%	0%	0%	100%	0%
ProbJu 2	0%	0%	0%	0%	0%
ProbJu 3	0%	0%	0%	0%	0%
ProbJu 4	0%	0%	0%	0%	0%
ProbJu 5	0%	0%	0%	0%	100%
ProbJu 6	0%	0%	0%	0%	0%
ProbJu 7	0%	0%	0%	0%	0%
ProbJu 8	100%	100%	100%	0%	0%

Table 10.5.2 Group Level Simulation Analysis of Chilled Orange Juice Beverages Across Clusters (Contd.)

Simulation Summary	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
BTL					
ProbJu 1	12.93%	15.79%	11.58%	19.31%	13.80%
ProbJu 2	12.86%	14.61%	11.35%	18.78%	14.20%
ProbJu 3	12.93%	9.23%	12.04%	14.67%	9.99%
ProbJu 4	12.86%	8.05%	11.81%	14.14%	10.38%
ProbJu 5	12.01%	12.52%	8.30%	9.44%	17.34%
ProbJu 6	9.48%	12.56%	14.06%	8.36%	14.54%
ProbJu 7	12.90%	11.01%	13.18%	8.07%	13.48%
ProbJu 8	14.05%	16.23%	17.67%	7.22%	6.27%
Logit					
ProbJu 1	13.42%	26.03%	6.45%	46.21%	11.09%
ProbJu 2	13.09%	17.30%	5.99%	37.52%	12.98%
ProbJu 3	13.42%	2.70%	7.48%	7.54%	2.42%
ProbJu 4	13.09%	1.80%	6.96%	6.12%	2.83%
ProbJu 5	9.58%	8.41%	2.25%	0.98%	45.53%
ProbJu 6	3.78%	8.52%	14.32%	0.64%	14.85%
ProbJu 7	13.32%	4.99%	10.80%	0.57%	9.74%
ProbJu 8	20.28%	30.25%	45.75%	0.41%	0.55%

segment was expected to have a preference for the chilled probiotic orange juice ProbJu 1 (mean score 7.5 out of 9).

Group Level Simulation Analysis for Cluster 1

The group level simulation analysis revealed that Cluster 1 would most prefer the chilled probiotic orange juice ProbJu 9 (mean score 6.8 out of 9) (See Table 10.5.3). In Table 10.5.3 the highest preference score is in bold and the lowest preference score is in italic. This beverage was described as a familiar brand of chilled freshly squeezed orange juice. ProbJu 9 was also characterised by a smooth style texture and a slightly sweet flavour. ProbJu 9 contained added probiotic cultures and selected ingredients to aid the digestive system, and retailed at €1.90 per litre. In contrast, Cluster 1 would least like the non-functional juice ProbJu 16 (mean score 4.4 out of 9).

Table 10.5.3 Group Level Simulation Analysis of Chilled Probiotic Orange Juice Beverages for Cluster 1

Attributes	ProbJu 9	ProbJu 10	ProbJu 11	ProbJu 12	ProbJu 13	ProbJu 14	ProbJu 15	ProbJu 16
Brand	Familiar Brand	New Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand
Juice Type	Freshly Squeezed	Freshly Squeezed	Freshly Squeezed	Made From Con.	Made From Con.	Not from Con.	Not from Con.	Freshly Squeezed
Texture	Smooth Style	Smooth Style	Smooth Style	Smooth Style	Smooth Style	Smooth Style	Smooth Style	Contains Fruity Bits
Flavour	Slightly Sweet	Slightly Sweet	Slightly Sweet	Slightly Sweet	Slightly Sweet	Slightly Sweet	Sweet	Tangy, Sharp, Slightly Bitter
Health Benefits	Aid the Digestive System	Aid the Digestive System	Aid the Immune System	Aid the Digestive System	Aid the Immune System	Aid the Digestive System	None	None
Price	€1.90 per L	€2.80 per L	€2.80 per L	€1.90 per L	€1.90 per L	€3.70 per L	€2.80 per L	€2.80 per L
Pref. Score	**6.8**	6.3	6.3	5.6	5.5	4.8	4.7	*4.4*
Max. Utility	100%	0%	0%	0%	0%	0%	0%	0%
BTL	15.34%	14.18%	14.12%	12.50%	12.44%	10.81%	10.67%	9.93%
Logit	32.38%	19.35%	18.87%	9.16%	8.93%	4.33%	4.07%	2.92%

Although ProbJu 9 was expected to receive the highest predicted preference score for Cluster 1, this chilled probiotic orange juice beverage was not considered commercially feasible, owing to its very low (€1.90 per litre) retail price. Importantly, the group level simulation analysis within clusters allowed trade-offs between product attributes and attribute levels to be studied. For example, ProbJu 10, a new branded variant of ProbJu 9 retailing at €2.80 per litre also yielded a relatively high predicted preference score (mean score 6.3 out of 9). It was previously shown in Table 10.4.1 that this segment of purchasers was not functionality driven in terms of its preferences for chilled orange juice. Consequently, changes to the proposed health benefits, from a chilled probiotic orange juice that aided the digestive system (ProbJu 10) to a chilled probiotic orange juice that aided the immune system (ProbJu 11), would not affect the predicted preference scores. However, the BTL and Logit models indicated that the predicted market share would be higher for ProbJu 10 than for ProbJu 11 (See Table 10.5.3). More importantly, the conjoint models predicted that members of Cluster 1 would not make trade-offs between the type of juice and price when evaluating alternative chilled probiotic orange juices. Specifically, Cluster 1 would be expected to be more receptive towards ProbJu 10, a chilled freshly squeezed probiotic orange juice retailing at €2.80 per litre, than ProbJu 12, a chilled 'made from concentrate' variant of ProbJu 10 retailing at €1.90 per litre, according to the predicted preference scores and probability (BTL and Logit) models (See Table 10.5.3).

Group Level Simulation Analysis for Cluster 2

Cluster 2 exhibited different preferences for chilled probiotic orange juice to Cluster 1. In Table 10.5.4 the highest preference score is in bold and the lowest preference score is in italic. The conjoint models predicted that Cluster 2 would most prefer the probiotic chilled orange juice ProbJu 17 (mean score 7.8 out of 9) (See Table 10.5.4). This beverage was described as a new brand of chilled freshly squeezed orange juice that contained fruity bits. ProbJu 17 was characterised by a sweet flavour. This beverage contained added probiotic cultures and selected ingredients to aid the digestive system, and retailed at €1.90 per litre. However, ProbJu 17 was not considered commercially feasible, owing to its very low (€1.90 per litre) retail price. In this context, the group level simulation analysis within clusters made it possible to study trade-offs between added ingredients, price and type of juice. The conjoint

Table 10.5.4 Group Level Simulation Analysis of Chilled Probiotic Orange Juice Beverages for Cluster 2

Attributes	ProbJu 17	ProbJu 18	ProbJu 19	ProbJu 20	ProbJu 21	ProbJu 22	ProbJu 23	ProbJu 24
Brand	New Brand	New Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand
Juice Type	Freshly Squeezed	Freshly Squeezed	Freshly Squeezed	Made From Con.	Made From Con.	Not from Con.	Not from Con.	Freshly Squeezed
Texture	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits
Flavour	Sweet	Sweet	Sweet	Sweet	Sweet	Sweet	Sweet	Tangy, Sharp, Slightly Bitter
Health Benefits	Aid the Digestive System	Aid the Digestive System	Aid the Immune System	Aid the Digestive System	Aid the Immune System	Aid the Digestive System	None	None
Price	€1.90 per L	€2.80 per L	€2.80 per L	€1.90 per L	€1.90 per L	€3.70 per L	€2.80 per L	€2.80 per L
Pref. Score	**7.8**	5.5	5.1	7.3	6.9	*3.7*	4.3	4.3
Max. Utility	100%	0%	0%	0%	0%	0%	0%	0%
BTL	17.35%	12.25%	11.34%	16.19%	15.28%	8.30%	9.66%	9.63%
Logit	44.69%	4.52%	3.00%	26.56%	17.65%	0.77%	1.41%	1.40%

analysis previously revealed that Cluster 2 was primarily influenced by price when evaluating alternative chilled orange juices (See Table 10.4.1). Therefore, an increase in price from €1.90 per litre (ProbJu 17) to €2.80 per litre (ProbJu 18) resulted in a low predicted preference score (mean score 5.5 out of 9). Instead, the simulation analysis revealed that Cluster 2 was willing to make trade-offs between the type of juice and price. Specifically, the conjoint models predicted that ProbJu 20, a chilled 'made from concentrate' variant of ProbJu 17 retailing at €1.90 per litre, would be more preferred than ProbJu 18, a chilled freshly squeezed probiotic orange juice retailing at €2.80 per litre (See Table 10.5.4). Not surprisingly therefore, ProbJu 22, a chilled 'not from concentrate' variant of ProbJu 17 retailing at €3.70 per litre, was predicted to receive the lowest preference score (mean score 3.7 out of 9) of the eight beverage concepts shown in Table 10.5.4.

Group Level Simulation Analysis for Cluster 3

The conjoint models predicted that Cluster 3 would most prefer the chilled probiotic orange juice ProbJu 25 (mean score 7.2 out of 9) (See Table 10.5.5). In Table 10.5.5 the highest preference score is in bold and the lowest preference score is in italic. This beverage was described as a new brand of chilled freshly squeezed orange juice that contained fruity bits. ProbJu 25 was also characterised by a slightly sweet flavour, contained added probiotic cultures and selected ingredients to aid the digestive system, and retailed at €1.90 per litre. However, ProbJu 25 was not considered commercially feasible, owing to its very low (€1.90 per litre) retail price. An increase in price from €1.90 per litre (ProbJu 25) to €2.80 per litre (ProbJu 28) gave a relatively high predicted preference score (mean score 6.8 out of 9). The conjoint analysis revealed that the type of juice attribute was not important to this cluster in terms of purchase preferences. The conjoint models predicted that Cluster 3 would give equal preference towards ProbJu 26 (mean score 7.2 out of 9), which was a 'made from concentrate' variant of ProbJu 25. This corresponded with the maximum utility, BTL and Logit values for Cluster 3 (See Table 10.5.5). The conjoint models also revealed that changes to the proposed health benefits, from a probiotic orange juice that aided the digestive system (ProbJu 26) to a probiotic orange juice that aided the immune system (ProbJu 27), would not have a dramatic effect on the predicted preferences scores. Instead, the flavour attribute was most important to Cluster 3 and this segment gave a negative utility value for a tangy, sharp, slightly bitter flavoured chilled

Table 10.5.5 Group Level Simulation Analysis of Chilled Probiotic Orange Juice Beverages for Cluster 3

Attributes	ProbJu 25	ProbJu 26	ProbJu 27	ProbJu 28	ProbJu 29	ProbJu 30	ProbJu 31	ProbJu 32
Brand	New Brand	New Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand
Juice Type	Freshly Squeezed	Made From Con.	Made From Con.	Freshly Squeezed	Freshly Squeezed	Not from Con.	Made From Con.	Freshly Squeezed
Texture	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Smooth Style	Contains Fruity Bits
Flavour	Slightly Sweet	Slightly Sweet	Slightly Sweet	Slightly Sweet	Slightly Sweet	Slightly Sweet	Sweet	Tangy, Sharp, Slightly Bitter
Health Benefits	Aid the Digestive System	Aid the Digestive System	Aid the Immune System	Aid the Digestive System	Aid the Immune System	Aid the Digestive System	None	None
Price	€1.90 per L	€1.90 per L	€1.90 per L	€2.80 per L	€2.80 per L	€3.70 per L	€1.90 per L	€2.80 per L
Pref. Score	**7.2**	**7.2**	7.1	6.8	6.7	4.4	5.7	*2.7*
Max. Utility	50%	50%	0%	0%	0%	0%	0%	0%
BTL	15.12%	15.12%	14.97%	14.16%	14.01%	9.12%	11.90%	5.59%
Logit	22.57%	22.57%	20.99%	14.25%	13.25%	1.29%	4.86%	0.24%

orange juice (See Table 10.4.1). Not surprisingly therefore, the conjoint models predicted that Cluster 3 would least like ProbJu 32 (mean score 2.7 out of 9) (See Table 10.5.5).

Group Level Simulation Analysis for Cluster 4

The conjoint models predicted that Cluster 4 would most prefer the probiotic chilled orange juice ProbJu 33 (mean score 8.5 out of 9) (See Table 10.5.6). In Table 10.5.6 the highest preference score is in bold and the lowest preference score is in italic. This beverage was described as a familiar brand of chilled freshly squeezed orange juice that contained fruity bits. ProbJu 33 was also characterised by a slightly sweet flavour, contained added probiotic cultures and selected ingredients to aid the digestive system, and retailed at €1.90 per litre. Again, ProbJu 33 was not considered commercially feasible, owing to its very low (€1.90 per litre) retail price. The conjoint models indicated that this cluster would not make trade-offs between the type of juice and price. Specifically, it was predicted that ProbJu 36 (mean score 8.1 out of 9), a new branded variant of ProbJu 33 retailing at €2.80 per litre, would receive a higher preference score than ProbJu 34 (mean score 7.1 out of 9) which was a new branded 'made from concentrate' variant of ProbJu 33 retailing at €1.90 per litre (See Table 10.5.6). The conjoint models also predicted that Cluster 4 would least like ProbJu 39 (mean score 3.3 out of 9).

Group Level Simulation Analysis for Cluster 5

Cluster 5 exhibited different preferences for chilled orange juice to the other four segments. In Table 10.5.7 the highest preference score is in bold and the lowest preference score is in italic. The conjoint models revealed that Cluster 5 would most prefer the chilled non-functional orange juice ProbJu 41 (mean score 7.6 out of 9) (See Table 10.5.7). ProbJu 41 was described as a familiar brand of chilled 'not from concentrate' orange juice that contained fruity bits. This beverage was characterised by a tangy, sharp, slightly bitter flavour. ProbJu 41 did not contain added probiotic cultures or selected ingredients and retailed at €1.90 per litre. However, ProbJu 41 was not considered commercially feasible, owing to its very low (€1.90 per litre) retail price. Overall, the simulation analysis revealed that this cluster would be more receptive towards ProbJu 48 (mean score 6.9 out of 9) a chilled non-functional freshly

Table 10.5.6 Group Level Simulation Analysis of Chilled Probiotic Orange Juice Beverages for Cluster 4

Attributes	ProbJu 33	ProbJu 34	ProbJu 35	ProbJu 36	ProbJu 37	ProbJu 38	ProbJu 39	ProbJu 40
Brand	Familiar Brand	New Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand
Juice Type	Freshly Squeezed	Made From Con.	Made From Con.	Freshly Squeezed	Freshly Squeezed	Not from Con.	Not from Con.	Freshly Squeezed
Texture	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits
Flavour	Slightly Sweet	Slightly Sweet	Slightly Sweet	Slightly Sweet	Slightly Sweet	Slightly Sweet	Sweet	Tangy, Sharp, Slightly Bitter
Health Benefits	Aid the Digestive System	Aid the Digestive System	Aid the Immune System	Aid the Digestive System	Aid the Immune System	Aid the Digestive System	None	None
Price	€1.90 per L	€1.90 per L	€1.90 per L	€2.80 per L	€2.80 per L	€3.70 per L	€2.80 per L	€2.80 per L
Pref. Score	**8.5**	7.1	6.9	8.1	7.9	6.2	*3.3*	3.7
Max. Utility	100%	0%	0%	0%	0%	0%	0%	0%
BTL	16.38%	13.80%	13.40%	15.71%	15.30%	11.97%	6.31%	7.13%
Logit	34.79%	9.17%	7.45%	24.58%	19.96%	3.57%	0.19%	0.29%

Table 10.5.7 Group Level Simulation Analysis of Chilled Probiotic Orange Juice Beverages for Cluster 5

Attributes	ProbJu 41	ProbJu 42	ProbJu 43	ProbJu 44	ProbJu 45	ProbJu 46	ProbJu 47	ProbJu 48
Brand	Familiar Brand	New Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand
Juice Type	Not from Con.	Not from Con.	Not from Con.	Freshly Squeezed	Freshly Squeezed	Made From Con.	Not from Con.	Freshly Squeezed
Texture	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits	Contains Fruity Bits
Flavour	Tangy, Sharp, Slightly Bitter	Tangy, Sharp, Slightly Bitter	Tangy, Sharp, Slightly Bitter	Tangy, Sharp, Slightly Bitter	Tangy, Sharp, Slightly Bitter	Tangy, Sharp, Slightly Bitter	Sweet	Tangy, Sharp, Slightly Bitter
Health Benefits	None	Aid the Immune System	Aid the Digestive System	Aid the Immune System	Aid the Digestive System	Aid the Immune System	None	None
Price	€1.90 per L	€3.70 per L	€3.70 per L	€2.80 per L	€2.80 per L	€1.90 per L	€2.80 per L	€2.80 per L
Pref. Score	**7.6**	5.8	5.7	5.7	5.5	3.0	5.8	6.9
Max. Utility	100%	0%	0%	0%	0%	0%	0%	0%
BTL	16.58%	12.71%	12.37%	12.31%	11.97%	6.42%	12.60%	15.04%
Logit	44.72%	7.56%	6.46%	6.28%	5.37%	0.42%	7.18%	22.02%

squeezed orange juice, and less receptive towards a range of chilled functional orange juices as illustrated in Table 10.5.7. This cluster was highly influenced by the type of juice in terms of purchase preferences (See Table 10.4.1). Not surprisingly, the conjoint models predicted that Cluster 5 would least like the chilled functional 'made from concentrate' orange juice ProbJu 46 (mean score 3.0 out of 9) (See Table 10.5.7).

10.6 Summary

In this chapter the results of a conjoint analysis study that investigated customers' preferences for a range of chilled probiotic orange juice beverages was presented. This market-oriented approach to NPD used the conjoint analysis method, which identified the most important product design attributes that influenced purchasers' preferences for new chilled orange juice. Four out of five clusters identified exhibited preferences for chilled probiotic orange juice beverages. Furthermore, all four segments preferred probiotic chilled orange juice beverages that aided the digestive system. Interestingly, only one segment of purchasers was classified as functionality driven in terms of its preferences for chilled orange juice, and similar findings were highlighted in the previous conjoint-based study (Chapter 9). Other important similarities to the previous study across clusters, from both a marketing and NPD perspective, included the negative utility values for chilled 'not from concentrate' orange juice, and the low importance values for both the texture and brand attributes. In this study, simulation analysis within clusters helped identify new beverage concepts that could be targeted effectively at each potential market segment. Chapter 11 presents the results of the final conjoint analysis study investigating customers' preferences for a range of stimulant beverages.

Chapter 11: Results: Stimulant Beverage Study

11.1 Introduction

This chapter presents the results and analysis of a conjoint-based survey conducted in Cork between September and November 2004. This study investigated customers' preferences for a range of new stimulant beverages. The results and analysis in this chapter is divided into four main sections: participant profile; individual level conjoint analysis; individual level k-means cluster analysis; and the group level simulation analysis. An overall summary of the key findings arising from this conjoint-based survey is then presented.

11.2 Participant Profile

Four hundred purchasers of soft drinks completed the conjoint-based survey conducted in Cork between September and November 2004. The participant profile is outlined in Table 11.2.1. An analysis of the socio-demographic variables of the survey sample revealed that 44 per cent of respondents were male and 56 per cent of respondents were female. The age profile of respondents ranged from 18 to 39 years with over forty-nine per cent of respondents aged 26 years or less. The vast majority of respondents were either single (68.7%) or married (23.5%). Forty-six per cent of respondents had completed third level education while over 41 per cent of respondents were pursuing further education (See Table 11.2.1). Not surprisingly therefore, the ABC1 social class groupings accounted for over 79 per cent of the total sample, with over 41 per cent of respondents classified as students, although all social class groupings were represented in this study (See Table 11.2.1). However, as Safefood (2001) and Transition Management (2001) noted, an important market segment for stimulant drinks in Ireland included those aged between 18 and 24 years, students, and those who frequented nightclubs. The vast majority of respondents resided in either single (56%) or dual income (30.7%) households. The vast majority of respondents appeared to be in the pre-family lifestyle stage (See Table 11.2.1). Urban and county or rural respondents were represented in this study, although the sample composition was biased towards urban and suburban (77%) residents.

Table 11.2.1 Participant Socio-demographic Profile

Socio-Demographic Variable	Category	Sample (N)	Sample (%)
Gender	Male	176	44.0
	Female	224	56.0
Age Group (years)	18-20	15	3.8
	21-23	149	37.3
	24-26	34	8.5
	27-29	25	6.2
	30-32	29	7.2
	33-35	61	15.2
	36-39	87	21.8
Marital Status	Single	275	68.7
	Married	94	23.5
	Separated/Divorced	0	0.0
	Cohabiting	31	7.8
	Widowed	0	0.0
Educational Status	No Formal Education	0	0.0
	Primary Level	3	0.7
	Intermediate/Junior Cert.	19	4.7
	Leaving Cert.	27	6.8
	Pursuing Further Education	167	41.8
	Completed Further Education	184	46.0
Employment Status	Employed Full Time	150	37.5
	Employed Part Time	35	8.8
	Self Employed	17	4.2
	Unemployed	6	1.5
	Disability Allowance	3	0.7
	Training Scheme	11	2.8
	Unpaid Work in the Home	6	1.5
	Retired	0	0.0
	Student	166	41.5
	Other	6	1.5

Table 11.2.1 Participant Socio-demographic Profile (Contd.)

Socio-Demographic Variable	Category	Sample (N)	Sample (%)
Social Class	A	63	15.8
	B	89	22.2
	C1	166	41.5
	C2	36	9.0
	D	27	6.8
	E	19	4.7
Household Income (€)	≤€99	63	15.8
	€100-199	22	5.5
	€200-299	4	1.0
	€300-399	11	2.8
	€400-499	43	10.7
	€500-599	12	3.0
	€600-699	5	1.2
	€700-799	17	4.2
	€800-899	20	5.0
	€900-999	0	0.0
	≥€1000	55	13.8
	Decline to Answer	148	37.0
Incomes per Household	Single Income	224	56.0
	Dual Income	123	30.7
	Multiple Incomes	53	13.3
No. Children (≤17 yrs)	None	349	87.2
	1 Child	28	7.0
	2 Children	18	4.5
	More than Two Children	5	1.2
No. Children (≥18 yrs)	None	381	95.3
	1 Child	5	1.2
	2 Children	10	2.5
	More than Two Children	4	1.0
Area of Residence	City (Urban)	178	44.5
	City (Suburban)	130	32.5
	County	92	23.0

11.3 Individual Level Conjoint Analysis

Overall, this study revealed that purchasers of soft drinks were most influenced by the added ingredients and flavour attributes (See Figure 11.3.1). Both added ingredients and flavour recorded averaged attribute importance values of 22.94 (out of 100) and 21.76 (out of 100) respectively. The type of packaging (18.82 out of 100) and price (18.34 out of 100) attributes were also deemed important when purchasing soft drinks. The carbonation level (11.72 out of 100) and brand (6.42 out of 100) attributes were least important to purchasers of soft drinks. Pearson's R and Kendall's tau association values were used to assess the validity of the conjoint analysis model, at both

individual and aggregate levels, in order to determine the strength of the relationship between the product rating scores and the predicted utilities derived from the conjoint model. The Pearson's R (0.994) and Kendall's tau (0.967) values were high and indicated strong agreement between the averaged product ratings and the predicted utilities from the conjoint analysis model (See Table 11.3.1).

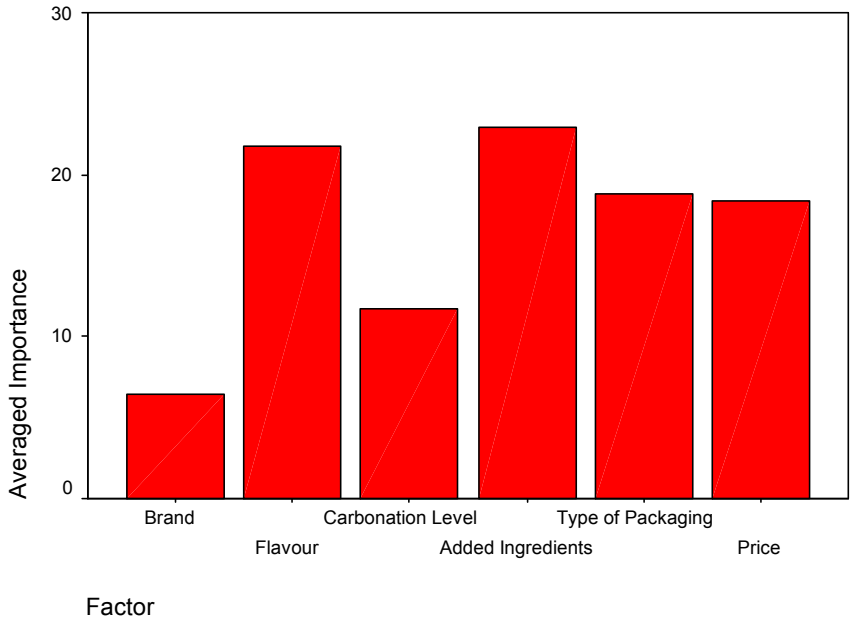


Figure 11.3.1 The Averaged Attribute Importance Summary of the Individual Level Conjoint Analysis for Stimulant Beverages

11.3.1 The Averaged Utility Values of the Individual Level Conjoint Analysis

Purchasers' perceived value from the addition of selected functional ingredients to soft drinks. Specifically, the addition of natural stimulant ingredients, such as ginseng and guarana, to soft drinks yielded a positive utility value of 0.3490. In contrast, the addition of conventional stimulant ingredients, such as caffeine and taurine, to soft drinks elicited a negative utility value (-0.1704) (See Table 11.3.1). Overall, purchasers of soft drinks were more receptive towards fruit juice-based soft drinks than fruit flavoured soft drinks. Specifically, respondents preferred orange juice-based (0.2510) to either apple juice-based (0.0532) or lemon and lime flavoured (-0.3043) soft drinks. In this study it appeared that portability was important to purchasers of soft drinks. Specifically, plastic bottles (0.2289) were more preferred to glass bottles (0.1610) when choosing between alternative soft drink packages. In contrast,

purchasers of soft drinks held negative perceptions of aluminium cans, which was indicated by a negative utility score of -0.3899. Further analysis of the summary utility values helped explain purchasers' preferences for alternatives within attributes.

Table 11.3.1 Summary of the Individual Level Conjoint Analysis

Averaged Importance (Out of 100)	Attribute	Attribute Level	Utility[55]
6.42	Brand	Familiar Brand	*-0.0077*
		New Brand	**0.0077**
21.76	Flavour	Blend of Orange Juice & Spring Water	**0.2510**
		Blend of Apple Juice & Spring Water	0.0532
		Lemon & Lime Flavoured Spring Water	*-0.3043*
11.72	Carbonation Level	Still (Non-carbonated)	*-0.0445*
		Sparkling (Carbonated)	**0.0445**
22.94	Added Ingredients	No Added Vitamins, Herbs or Other Stimulant Ingredients	*-0.1785*
		B Vitamins and Natural Energy-boosting Ginseng and Guarana	**0.3490**
		B Vitamins, Caffeine and Taurine to Stimulate Both Mind and Body	-0.1704
18.82	Type of Packaging	Glass Bottle	0.1610
		Aluminium Can	*-0.3899*
		Plastic Bottle	**0.2289**
18.34	Price	€1.25 per 250ml	**0.4115**
		€1.70 per 250ml	0.0990
		€2.15 per 250ml	*-0.5104*

Constant = 4.2870

Pearson's R = 0.9940 Significance = 0.0000

Kendall's tau = 0.967 Significance = 0.0000

Kendall's tau = 0.667 for 4 holdouts Significance = 0.0871

[55] In Table 11.3.1 the highest utility values are in **bold** and the lowest utility values are in *italic.*

Overall, low priced (€1.25 per 250ml) and medium priced (€1.70 per 250ml) soft drinks elicited positive utility values of 0.4115 and 0.0990 respectively. However, purchasers of soft drinks disliked high priced soft drinks and the €2.15 per 250ml price level yielded a negative utility value of –0.5104. A utility reversal summary showed that 228 purchasers of soft drinks exhibited some form of price reversal, which was reflected in their individual utility estimates. The significance of these price reversals in the context of market segmentation is discussed in more detail in Section 11.4. The utility values for carbonation level were low, although purchasers preferred sparkling soft drinks (0.0445) to still soft drinks (-0.0445). Finally, brand was considered the least important of the six attributes taken into account when respondents purchased soft drinks. In general, the individual level conjoint analysis procedure identified added ingredients, flavour, type of packaging and price as the most important attributes that influenced purchasers' preferences for new soft drinks. The next stage of the analysis involved a k-means cluster analysis of purchasers' attribute level utility values to identify potential market segments for new stimulant beverages.

11.4 Individual Level K-means Cluster Analysis

K-means cluster analysis pre-determined that five clusters of purchasers existed with similar preferences for soft drinks (See Table 11.4.1). The market segmentation typology for each cluster is presented in a number of tables (See Table 11.4.2 to Table 11.4.4). Significant relationships were found between cluster membership and a number of these variables, which for segmentation purposes, helped further distinguish between clusters (See Table 11.4.2 to Table 11.4.4). Three of the five segments identified in this study were receptive towards stimulant beverages. Purchasers of soft drinks were most discerning when they evaluated alternative functional soft drink concepts. Specifically, three of the five clusters(Clusters 1, 3 and 5) held negative perceptions towards soft drinks enriched with stimulant ingredients associated with *Red Bull* such as caffeine and taurine (See Table 11.4.1). Four of the five clusters identified in this study preferred juice-based soft drinks to fruit flavoured soft drinks, and distinct preferences were evident for either orange juice-based or apple juice-based soft drinks. Overall, three of the five clusters identified were receptive towards both glass and plastic packaging. Interestingly, this research revealed that four of the five clusters were receptive towards medium priced (€1.70 per 250ml) soft drinks. Clusters 1, 3 and 4 preferred sparkling soft drinks while

Clusters 2 and 5 preferred still soft drinks. Overall, the brand attribute was not important to respondents' purchase preferences for soft drinks (See Table 11.4.1).

Table 11.4.1 Averaged Attribute Utilities for Stimulant Beverages by Cluster

Attribute Level	Cluster 1 (Utility[56])	Cluster 2 (Utility)	Cluster 3 (Utility)	Cluster 4 (Utility)	Cluster 5 (Utility)
Familiar Brand	*-0.02*	*-0.08*	0.00	**0.14**	**0.30**
New Brand	**0.02**	**0.08**	0.00	*-0.14*	*-0.30*
Blend of Orange Juice & Spring Water	**1.11**	0.02	*-0.06*	**1.52**	-0.10
Blend of Apple Juice & Spring Water	0.93	**0.09**	-0.01	*-0.86*	**0.63**
Lemon & Lime Flavoured Spring Water	*-2.04*	*-0.11*	**0.07**	-0.67	*-0.54*
Still (Non-carbonated)	*-0.42*	**0.13**	*-0.06*	*-0.61*	**0.33**
Sparkling (Carbonated)	**0.42**	*-0.13*	**0.06**	**0.61**	*-0.33*
No Added Ingredients	-0.68	*-0.64*	0.07	**0.22**	**2.48**
B Vitamins, Ginseng and Guarana	**1.51**	0.31	**0.59**	*-0.30*	-1.11
B Vitamins, Caffeine and Taurine	*-0.83*	**0.34**	*-0.66*	0.08	*-1.38*
Glass Bottle	**0.85**	0.01	**0.25**	*-0.07*	**0.38**
Aluminium Can	*-1.62*	*-0.58*	0.10	**0.14**	*-0.56*
Plastic Bottle	0.77	**0.58**	*-0.35*	*-0.07*	0.18
€1.25 per 250ml	*-0.10*	**0.57**	**0.33**	**0.13**	**0.90**
€1.70 per 250ml	**0.15**	0.12	0.12	**0.13**	-0.38
€2.15 per 250ml	-0.05	*-0.70*	*-0.45*	*-0.26*	*-0.51*
Cluster Size	34	184	116	45	21

Attribute Preferences and Typology for Cluster 1

Cluster 1 which contained thirty-four purchasers of soft drinks gave the highest utility value for added functional ingredients across clusters and was considered functionality driven in terms of its purchase preferences (See Table 11.4.1). Cluster 1 most

[56] In Table 11.4.1 the highest utility values are in **bold** and the lowest utility values are in *italic*.

preferred stimulant soft drinks that contained B Vitamins and natural energy-boosting ginseng and guarana (1.51). However, this cluster held negative attitudes, expressed as a negative utility value (-0.83), towards stimulant soft drinks that contained B Vitamins, caffeine and taurine to stimulate both mind and body. Cluster 1 was receptive towards fruit juice-based soft drinks, and this segment preferred orange juice-based soft drinks (1.11) to apple juice-based soft drinks (0.93). In particular, Cluster 1 was the least receptive segment across clusters towards fruit flavoured soft drinks (-2.04) as shown in Table 11.4.1. The type of packaging attribute was also important to this segment of respondents. Cluster 1 preferred glass (0.85) and plastic (0.77) packaging to aluminium cans (-1.62), and this cluster of purchasers also preferred sparkling to still soft drinks. Cluster 1 gave negative utility values for both low priced (€1.25 per 250ml) (-0.10) and high priced (€2.15 per 250ml) (-0.05) soft drinks. Instead, Cluster 1 was most receptive towards medium priced (€1.70 per 250ml) (0.15) soft drinks. Brand was the least important attribute to Cluster 1, and this segment was receptive towards new soft drink brands (See Table 11.4.1). Membership of Cluster 1 was skewed towards females who represented 73.5 per cent of that cluster. It was evident from Table 11.4.2 that the age profile of Cluster 1 was also biased towards the older age groups. Specifically, over 61 per cent of respondents in Cluster 1 were aged 36 years or older. Cluster 1 was comprised of respondents from the ABC1 social class groupings only (See Table 11.4.2). This cluster also contained the highest percentage of respondents with one child aged 17 years of age or less.

An analysis of respondents' purchase preferences for soft drink and other beverages revealed that respondents in Cluster 1 were relatively heavy purchasers of natural mineral water and flavoured mineral water. Specifically, Cluster 1 contained the highest percentage of respondents across clusters that purchased natural mineral water once per day (52.9%), and flavoured mineral water two to three times per week (17.6%). In contrast it appeared that Cluster 1 infrequently purchased fruit juice, juice drinks, and a range of carbonated soft drinks in comparison to the other four clusters (See Table 11.4.3). It appeared that respondents in Cluster 1 were generally more receptive towards performance beverages, based upon their purchaser frequency for performance beverages, than respondents in the other four clusters (See Table 11.4.3). Approximately twenty-three per cent of respondents in Cluster 1 purchased stimulant drinks, and *Red Bull* in particular (See Table 11.4.4). Significant relationships were

found between age (p≤0.05), marital status (p≤0.001), occupational status (p≤0.001), education level attained (p≤0.001), and purchase frequency of stimulant drinks. All purchasers of stimulant drinks in Cluster 1 consumed *Red Bull* either in public houses or at work or college. Not surprisingly, stimulant drinks were therefore consumed at specific times of the day. The vast majority of purchasers of stimulant drinks consumed *Red Bull* during the afternoon (75%), while twenty-five percent of them consumed *Red Bull* in the morning time.

Table 11.4.2 Socio-demographic Profiles for Stimulant Beverages by Cluster

Socio-Demographic Category	Cluster 1 %	Cluster 2 %	Cluster 3 %	Cluster 4 %	Cluster 5 %
Gender					
Male	26.5%	54.3%	27.6%	55.6%	47.6%
Female	73.5%	45.7%	72.4%	44.4%	52.4%
Age Group (years)					
18-20	-	3.8%	5.2%	-	9.5%
21-23	14.7%	39.7%	45.7%	33.3%	14.3%
24-26	5.9%	7.6%	5.2%	17.8%	19.0%
27-29	17.6%	9.2%	1.7%	-	-
30-32	-	3.3%	19.8%	-	-
33-35	-	16.8%	9.5%	28.9%	28.6%
36-39	61.8%	19.6%	12.9%	20.0%	28.6%
Marital Status					
Single	32.4%	73.9%	76.7%	57.8%	61.9%
Married	67.6%	17.4%	12.1%	37.8%	38.1%
Cohabiting	-	8.7%	11.2%	4.4%	-
Educational Status*					
No Formal Education	-	-	-	-	-
Primary Level	-	-	-	6.7%	-
Intermediate/Junior Cert.	-	6.5%	4.3%	-	9.5%
Leaving Cert.	-	6.5%	4.3%	11.1%	23.8%
Pursuing Further Edu.	29.4%	45.1%	42.2%	28.9%	57.1%
Completed Further Edu.	70.6%	41.8%	49.1%	53.3%	9.5%
Employment Status					
Employed Full Time	61.8%	39.1%	46.6%	31.1%	19.0%
Employed Part Time	17.6%	4.3%	1.7%	8.9%	-
Self Employed	-	-	2.6%	31.1%	-
Unemployed	-	1.1%	3.4%	-	-
Disability Allowance	-	-	2.6%	-	-
Training Scheme	-	3.8%	-	-	19.0%
Unpaid Work in the Home	-	-	-	-	28.6%
Retired	-	-	-	-	-
Student	20.6%	48.4%	43.1%	28.9%	33.3%
Other	-	3.3%	-	-	-

* Significant at p≤0.05

Table 11.4.2 Socio-demographic Profiles for Stimulant Beverages by Cluster (Contd.)

Socio-Demographic Category	Cluster 1 %	Cluster 2 %	Cluster 3 %	Cluster 4 %	Cluster 5 %
Social Class*					
A	41.2%	12.0%	11.2%	31.1%	-
B	38.2%	20.1%	22.4%	17.8%	23.8%
C1	20.6%	48.4%	43.1%	28.9%	33.3%
C2	-	6.0%	13.8%	8.9%	23.8%
D	-	8.2%	3.4%	13.3%	9.5%
E	-	5.4%	6.0%	-	9.5%
Household Income (€)*					
≤€99	8.8%	14.1%	17.2%	20.0%	23.8%
€100-199	-	7.1%	7.8%	-	-
€200-299	-	1.1%	-	4.4%	-
€300-399	-	2.2%	6.0%	-	-
€400-499	17.6%	17.9%	1.7%	-	9.5%
€500-599	-	6.5%	-	-	-
€600-699	-	-	-	4.4%	14.3%
€700-799	-	9.2%	-	-	-
€800-899	26.5%	3.3%	4.3%	-	-
€900-999	-	-	-	-	-
≥€1000	35.3%	9.8%	13.8%	20.0%	-
Decline to Answer	11.8%	28.8%	49.1%	51.1%	52.4%
Incomes per Household					
Single Income	14.7%	65.2%	57.8%	28.9%	90.5%
Dual Income	61.8%	27.7%	26.7%	44.4%	-
Multiple Incomes	23.5%	7.1%	15.5%	26.7%	9.5%
No. Children (≤17 yrs)*					
None	73.5%	86.4%	90.5%	93.3%	85.7%
1 Child	26.5%	6.0%	4.3%	6.7%	-
2 Children	-	6.5%	2.6%	-	14.3%
More than Two Children	-	1.1%	2.6%	-	-
No. Children (≥18 yrs)					
None	100%	95.7%	95.7%	100%	71.4%
1 Child	-	-	1.7%	-	14.3%
2 Children	-	2.2%	2.6%	-	14.3%
More than Two Children	-	2.2%	-	-	-
Area of Residence					
City (Urban)	73.5%	46.7%	30.2%	46.7%	52.4%
City (Suburban)	26.5%	30.4%	37.1%	26.7%	47.6%
County	-	22.8%	32.8%	26.7%	-

* Significant at p≤0.05

Table 11.4.3 Beverage Preferences and Purchase Behaviour Profiles by Cluster

Purchase Behaviour Category	Cluster 1 %	Cluster 2 %	Cluster 3 %	Cluster 4 %	Cluster 5 %
Purchase Behaviour - Natural Mineral Water					
More than Once per Day	-	7.1%	3.4%	4.4%	14.3%
Once per Day	52.9%	12.5%	14.7%	11.1%	38.1%
4-6 Times per Week	-	12.0%	15.5%	11.1%	-
2-3 Times per Week	14.7%	25.5%	25.0%	15.6%	23.8%
Once per Week	32.4%	24.5%	18.1%	24.4%	23.8%
Rarely	-	13.0%	20.7%	33.3%	-
Never	-	5.4%	2.6%	-	-
Purchase Behaviour - Flavoured Mineral Water*					
More than Once per Day	-	-	-	-	-
Once per Day	-	1.6%	1.7%	-	-
4-6 Times per Week	-	2.2%	2.6%	-	-
2-3 Times per Week	17.6%	5.4%	9.5%	4.4%	9.5%
Once per Week	-	23.4%	12.9%	11.1%	-
Rarely	38.2%	39.1%	38.8%	31.1%	42.9%
Never	44.1%	28.3%	34.5%	53.3%	47.6%
Purchase Behaviour - Pure Fruit Juice					
More than Once per Day	-	6.5%	5.2%	-	14.3%
Once per Day	-	3.8%	12.9%	-	28.6%
4-6 Times per Week	-	7.6%	6.9%	20.0%	14.3%
2-3 Times per Week	35.3%	31.0%	18.1%	26.7%	-
Once per Week	38.2%	26.1%	33.6%	17.8%	19.0%
Rarely	26.5%	21.7%	19.0%	31.1%	14.3%
Never	-	3.3%	4.3%	4.4%	9.5%
Purchase Behaviour - Juice Drinks					
More than Once per Day	-	1.1%	1.7%	-	-
Once per Day	-	-	2.6%	-	-
4-6 Times per Week	-	7.1%	3.4%	-	-
2-3 Times per Week	-	16.3%	7.8%	8.9%	28.6%
Once per Week	-	14.1%	11.2%	-	14.3%
Rarely	64.7%	26.1%	40.5%	40.0%	38.1%
Never	35.3%	35.3%	32.8%	51.1%	19.0%

* Significant at $p \leq 0.05$

Table 11.4.3 Beverage Preferences and Purchase Behaviour Profiles by Cluster (Contd.)

Purchase Behaviour Category	Cluster 1 %	Cluster 2 %	Cluster 3 %	Cluster 4 %	Cluster 5 %
Purchase Behaviour - Cola Flavoured Drink					
More than Once per Day	-	9.8%	-	-	-
Once per Day	-	4.3%	4.3%	8.9%	-
4-6 Times per Week	-	3.3%	6.0%	6.7%	9.5%
2-3 Times per Week	5.9%	19.6%	17.2%	17.8%	-
Once per Week	23.5%	20.1%	22.4%	11.1%	14.3%
Rarely	35.3%	14.1%	38.8%	37.8%	57.1%
Never	35.3%	28.8%	11.2%	17.8%	19.0%
Purchase Behaviour - Orange Flavoured Drink*					
More than Once per Day	-	2.2%	-	-	-
Once per Day	-	-	1.7%	-	9.5%
4-6 Times per Week	-	1.1%	6.0%	-	-
2-3 Times per Week	-	8.7%	8.6%	24.4%	-
Once per Week	23.5%	19.6%	25.9%	8.9%	14.3%
Rarely	32.4%	51.1%	51.7%	53.3%	61.9%
Never	44.1%	17.4%	6.0%	13.3%	14.3%
Purchase Behaviour - Lemon & Lime Drink*					
More than Once per Day	-	-	5.2%	-	-
Once per Day	-	-	1.7%	-	-
4-6 Times per Week	-	1.1%	-	4.4%	-
2-3 Times per Week	-	17.9%	7.8%	6.7%	9.5%
Once per Week	-	17.4%	28.4%	20.0%	38.1%
Rarely	73.5%	34.2%	42.2%	35.6%	38.1%
Never	26.5%	29.3%	14.7%	33.3%	14.3%
Purchase Behaviour - Lemonade Drink**					
More than Once per Day	-	-	-	-	-
Once per Day	-	-	1.7%	-	-
4-6 Times per Week	-	-	-	-	-
2-3 Times per Week	-	5.4%	1.7%	-	-
Once per Week	-	10.3%	10.3%	4.4%	28.6%
Rarely	29.4%	36.4%	64.7%	51.1%	33.3%
Never	70.6%	47.8%	21.6%	44.4%	38.1%

* Significant at $p \leq 0.05$

** Significant at $p \leq 0.001$

Table 11.4.3 Beverage Preferences and Purchase Behaviour Profiles by Cluster (Contd.)

Purchase Behaviour Category	Cluster 1 %	Cluster 2 %	Cluster 3 %	Cluster 4 %	Cluster 5 %
Purchase Behaviour - Other Flavoured Drinks					
More than Once per Day	-	-	-	-	-
Once per Day	-	-	-	-	-
4-6 Times per Week	-	-	-	-	-
2-3 Times per Week	-	2.2%	3.4%	-	-
Once per Week	-	11.4%	21.6%	6.7%	9.5%
Rarely	55.9%	50.5%	58.6%	28.9%	52.4%
Never	44.1%	35.9%	16.4%	64.4%	38.1%
Purchase Behaviour - Sports Drinks*					
More than Once per Day	-	1.1%	-	-	-
Once per Day	-	4.3%	2.6%	4.4%	14.3%
4-6 Times per Week	-	4.3%	5.2%	-	-
2-3 Times per Week	26.5%	10.3%	4.3%	33.3%	-
Once per Week	-	8.2%	6.0%	-	-
Rarely	58.8%	50.0%	41.4%	33.3%	28.6%
Never	14.7%	21.7%	40.5%	28.9%	57.1%
Purchase Behaviour - Energy Drinks*					
More than Once per Day	-	-	-	-	-
Once per Day	-	5.4%	2.6%	4.4%	-
4-6 Times per Week	-	6.0%	3.4%	4.4%	-
2-3 Times per Week	17.6%	10.3%	8.6%	-	-
Once per Week	32.4%	7.6%	6.9%	-	23.8%
Rarely	35.3%	33.2%	37.1%	51.1%	42.9%
Never	14.7%	37.5%	41.4%	40.0%	33.3%
Purchase Behaviour - Stimulant Drinks*					
More than Once per Day	-	-	-	-	-
Once per Day	-	2.2%	-	-	-
4-6 Times per Week	-	1.1%	-	-	-
2-3 Times per Week	-	8.7%	-	-	-
Once per Week	17.6%	2.2%	3.4%	6.7%	9.5%
Rarely	5.9%	22.3%	23.3%	8.9%	-
Never	76.5%	63.6%	73.3%	84.4%	90.5%

* Significant at $p \leq 0.05$

Table 11.4.4 Stimulant Beverage Purchase Behaviour and Consumption Profiles by Cluster

Purchase Behaviour and Consumption Category	Cluster 1 %	Cluster 2 %	Cluster 3 %	Cluster 4 %	Cluster 5 %
Brand Purchased (n=119)					
Red Bull	100%	78.3%	84.8%	100%	100%
Shark	-	-	6.1%	-	-
Irn Bru	-	2.9%	-	-	-
Other	-	18.8%	9.1%	-	-
Place of Consumption [57] **(n=119)**					
At Home	-	10.1%	6.1%	-	-
On-the-go	25%	17.4%	6.1%	-	-
Restaurant/Café	-	-	9.1%	-	-
Before Sports	-	4.3%	-	28.6%	-
Before Sports	-	-	-	-	-
At Work/College	100%	18.8%	27.3%	-	-
Public House	100%	23.2%	18.2%	42.9%	100%
Nightclub	25%	39.1%	51.5%	71.4%	-
Other	-	11.6%	24.2%	-	-
Amount Consumed per Week (n=119)*					
Less than 1 Can/Bottle	-	34.8%	69.7%	57.1%	-
1 Can/Bottle	100%	21.7%	12.1%	-	-
Aprox. 2 or 3 Cans/Bottles	-	24.6%	18.2%	42.9%	100%
Aprox. 4 or 5 Cans/Bottles	-	15.9%	-	-	-
Aprox. 6 or 7 Cans/Bottles	-	2.9%	-	-	-
Time of Consumption (n=119)					
Between 6am and 12pm	25.0%	17.4%	27.3%	-	-
Between 1pm and 5pm	75.0%	18.8%	24.2%	28.6%	-
Between 6pm and 12am	-	33.3%	18.2%	42.9%	-
Between 1am and 5am	-	30.4%	30.3%	28.6%	100%
Mixed with Alcohol (n=119)					
Always	-	27.5%	18.2%	28.6%	-
Sometimes	100%	29.0%	39.4%	42.9%	100%
Rarely	-	23.2%	-	28.6%	-
Never	-	13.0%	42.4%	-	-
Premixed Drink Purchased	-	7.2%	-	-	-

* Significant at $p \leq 0.05$

Attribute Preferences and Typology for Cluster 2

Cluster 2 contained 184 purchasers of soft drinks and this segment gave its highest utility value for the type of packaging attribute and portability was therefore important

[57] Respondents could give more than one answer concerning the place of consumption of stimulant drinks. Therefore, the total percentage is greater than 100 per cent.

to this cluster in terms of its purchase preferences (See Table 11.4.1). Specifically, Cluster 2 expressed a distinct preference for plastic packaging (0.58) over both glass bottles (0.01) and aluminium cans (-0.58). Price considerations were extremely important to Cluster 2 in terms of its purchase preferences. The conjoint analysis revealed that this segment of purchasers of soft drinks gave positive utility values for both low (€1.25 per 250ml) (0.57) and medium (€1.70 per 250ml) (0.12) priced soft drinks. In contrast, Cluster 2 disliked of high priced (€2.15 per 250ml) (-0.70) soft drinks. The added ingredients attribute was also important to purchasers in Cluster 2 when they evaluated alternative soft drinks. However, Cluster 2's preferences differed to those of Cluster 1. Specifically, Cluster 2 most preferred soft drinks that contained B Vitamins, caffeine and taurine to stimulate both mind and body (0.34). This segment also gave a high positive utility value for stimulant soft drinks that contained B Vitamins and natural energy-boosting stimulant ingredients such as ginseng and guarana (0.31). In contrast to Cluster 1, this segment preferred still soft drinks to sparkling soft drinks. Cluster 2 was receptive towards fruit juice-based soft drinks although this segment preferred apple juice-based soft drinks (0.09) to orange juice-based soft drinks (0.02). Brand was the least important attribute to Cluster 2, although, similar to Cluster 1, this segment was receptive towards new soft drink brands (See Table 11.4.1).

Both males and females were well represented in Cluster 2 although a slighter higher percentage of cluster members were male (54.3%). Respondents in Cluster 2 were relatively light purchasers of both natural and flavoured mineral water (See Table 11.4.3). In contrast, respondents in Cluster 2 were heavier purchasers of juice drinks, cola, orange and lemon and lime flavoured soft drinks than respondents in Cluster 1 (See Table 11.4.3). Interestingly, Cluster 2, which gave positive utility values for stimulant soft drinks, and caffeine and taurine-based stimulant soft drinks in particular, also contained a higher percentage of heavy purchasers of both energy and stimulant drinks relative to the other four segments (See Table 11.4.3). Furthermore, this segment of purchasers of soft drinks contained the second highest percentage of respondents that were single (73.9%), in single income households (65.2%), and contained the highest percentage of students (48.4%) across clusters (See Table 11.4.2). Significant relationships were found between marital status ($p \leq 0.05$), household income number ($p \leq 0.001$), occupational status ($p \leq 0.001$) and purchase

frequency for stimulant drinks. It was evident from Table 11.4.2 that the age profile of Cluster 2 was biased towards the 21 to 23 years (39.7%) and 33 to 39 years (36.4%) age groups, and a significant ($p \leq 0.001$) relationship was found between age and purchase frequency for stimulant drinks. Approximately thirty-six per cent of respondents in Cluster 2 purchased stimulant drinks, with the majority of those respondents purchasing *Red Bull* (78.3%) (See Table 11.4.4). The consumption profile of purchasers of stimulant drinks in Cluster 2 differed from that of Cluster 1. For example, these respondents (Cluster 2) were heavy consumers of stimulant drinks, and tended to consume stimulant drinks in a variety of locations. Furthermore, the majority of these respondents in Cluster 2 consumed stimulant drinks in the evening time (33.3%) and early morning (1am to 5am) (30.4%). Not surprisingly, a high percentage of these respondents always consumed stimulant drinks with alcohol (27.5%), and purchased premixed alcoholic stimulant drinks (7.2%) (See Table 11.4.4).

Attribute Preferences and Typology for Cluster 3

Cluster 3, the second largest segment identified in this study, contained 116 purchasers of soft drinks. Similar to Cluster 1, this segment considered the added ingredients attribute extremely important when evaluating alternative soft drinks (See Table 11.4.1). Cluster 3 most preferred stimulant soft drinks that contained B Vitamins and natural energy-boosting ginseng and guarana (0.59) and least liked stimulant soft drinks that contained B Vitamins, caffeine and taurine to stimulate both mind and body (-0.66). The price attribute was extremely important to this segment of purchasers of soft drinks. Cluster 3 gave positive utility values for both low priced (€1.25 per 250ml) (0.33) and medium priced (€1.70 per 250ml) (0.12) soft drinks. In contrast, Interestingly, Cluster 3 exhibited differing preferences for soft drinks to the other four segments. Specifically, Cluster 3 preferred fruit flavoured soft drinks (0.07) and was less receptive towards orange juice-based (-0.06) and apple juice-based (-0.01) soft drinks. Cluster 3 also preferred sparkling soft drinks (0.06) to still soft drinks (-0.06). Respondents in Cluster 3 were generally infrequent purchasers of performance beverages, and stimulant drinks in particular (See Table 11.4.3). The consumption profile of purchasers of stimulant drinks in Cluster 3 was similar to that of Cluster 2. The majority of purchasers of stimulant drinks in Cluster 3 consumed such beverages in nightclubs, at work or college, or in public houses. It appeared that membership of Cluster 3 was skewed towards females who represented 72.4 per cent

of that cluster, and a significant relationship ($p \leq 0.001$) was found between gender and purchase frequency for stimulant drinks. All age groups were represented in this cluster although membership of Cluster 3 appeared biased towards the 21-23 years (45.7%) and 30-32 years (19.8%) age groups, and a significant relationship ($p \leq 0.001$) was found between age and purchase frequency for stimulant drinks. The socio-demographic profile of Cluster 3 appeared similar to that of Cluster 2 with respect to martial, educational and employment status, and social class. For example, both clusters had a higher percentage of both single and cohabiting respondents, and students, relative to the other three segments (See Table 11.4.2). Significant relationships were found between marital status ($p \leq 0.001$), occupational status ($p \leq 0.001$), and purchase frequency for stimulant drinks.

Attribute Preferences and Typology for Cluster 4

Cluster 4 which contained forty-five purchasers of soft drinks gave the highest utility value for flavour across clusters (See Table 11.4.1). Cluster 4 most preferred orange juice-based soft drinks (1.52). In contrast, this segment disliked lemon and lime flavoured soft drinks (-0.67) and least liked apple juice-based soft drinks (-0.86). The level of carbonation was also highly important to Cluster 4. This segment preferred sparkling soft drinks (0.61) to still soft drinks. Overall, Cluster 4 most preferred non-functional soft drinks (0.22). Interestingly, the age profile of Cluster 4 was biased towards the 33 to 39 years (48.9%) age group (See Table 11.4.2), and a significant relationship ($p \leq 0.001$) was found between age and purchase frequency for stimulant drinks. Cluster 4 exhibited different preferences for the type of packaging to the other four segments. This segment of purchasers most preferred aluminium cans (0.14) and least liked both glass (0.07) and plastic (0.07) bottles (See Table 11.4.1). The price attribute was also less important to this segment of purchasers of soft drinks. Overall, Cluster 4 was receptive towards both low priced (€1.25 per 250ml) (0.13) and medium priced (€1.70 per 250ml) (0.13) soft drinks.

Both males and females were well represented in Cluster 4 although a slighter higher percentage (55.6%) of cluster members were male. The vast majority of respondents in Cluster 4 were either single (57.8%) or married (37.8%), and membership of Cluster 4 was biased towards the A and C1 social class groupings (See Table 11.4.2). Overall, members of Cluster 4 were infrequent purchasers of mineral water, flavoured mineral

water and juice drinks. In contrast, it appeared that these respondents purchased cola, orange flavoured soft drinks and pure fruit juice more frequently (See Table 11.4.3). Although the vast majority of respondents in Cluster 4 either 'rarely' (51.1%) or 'never' (40%) purchased energy drinks, over 37 per cent of respondents in this segment purchased sports drinks more than once per week. Less than sixteen per cent of respondents in Cluster 4 purchased stimulant drinks (See Table 11.4.3).

Attribute Preferences and Typology for Cluster 5

Cluster 5, which contained twenty-one purchasers of soft drinks, considered the added ingredients attribute extremely important when evaluating alternative soft drinks. However, unlike Cluster 1, this segment expressed negative attitudes towards functional soft drinks. Specially, Cluster 5 most preferred non-functional soft drinks (2.48) and least liked stimulant soft drinks that contained either B Vitamins and natural energy-boosting ginseng and guarana (-1.11), or stimulant soft drinks that contained B Vitamins, caffeine and taurine to stimulate both mind and body (-1.38) (See Table 11.4.1). Cluster 5 was also the most price sensitive segment of purchasers of soft drinks across clusters. This segment most liked low priced (€1.25 per 250ml) (0.90) soft drinks and least liked both the medium priced (€1.70 per 250ml) (-0.38) and high priced (€2.15 per 250ml) (-0.51) soft drinks. Cluster 5 preferred apple juice-based soft drinks (0.63) to either orange juice-based soft drinks (-0.10) or lemon and lime flavoured soft drinks (-0.54). The type of packaging attribute was also important to this segment of respondents. Cluster 5 preferred glass (0.38) and plastic (0.18) packaging to aluminium cans (-0.56), and this cluster of purchasers also preferred still (0.33) to sparkling (-0.33) soft drinks.

Both males and females were well represented in Cluster 5 although a slighter higher percentage (52.4%) of cluster members were female. It was evident from Table 11.4.2 that the age profile of Cluster 5 was also biased towards older age groups. Specifically, over 57 per cent of respondents in Cluster 5 were aged 33 years and older, and respondents in Cluster 5 were either single (61.9%) or married (38.1%). Although Cluster 5 contained the highest percentage of respondents pursuing further education (57.1%), this segment also had the highest percentage of respondents educated to either Intermediate or Junior Certificate (9.5%) or Leaving Certificate level (23.8%) only. Not surprisingly, although the majority of respondents were in the

C1 social class grouping (33.3%), over forty-two per cent of respondents in this segment were in the C2DE social class groupings (See Table 11.4.2). Overall, respondents in Cluster 5 were infrequent purchasers of flavoured soft drinks. More importantly, respondents in Cluster 5 preferred non-functional to functional soft drinks, and these respondents were also infrequent purchasers of sports drinks and energy drinks (See Table 11.4.3). Furthermore, only nine per cent of respondents in Cluster 5 purchased stimulant drinks and significant relationships were found between educational level attained ($p \leq 0.05$), occupational status ($p \leq 0.05$), social class ($p \leq 0.05$) and purchase frequency for stimulant drinks. In contrast, it appeared that these respondents purchased mineral water, pure fruit juice and fruit juice drinks more frequently (See Table 11.4.3). All purchasers of stimulant drinks in Cluster 5 consumed two to three cans or bottles of *Red Bull* per week in public houses. Not surprisingly, stimulant drinks were therefore consumed at specific times of the day. For this cluster, purchasers of stimulant drinks consumed *Red Bull* between 1am and 5am only (See Table 11.4.4).

11.5 Group Level Simulation Analysis

The Kendall's tau value of 0.667 for the four holdouts suggested less than perfect agreement between the holdout ratings and the model predictions although this value was within acceptable limits (See Table 11.3.1). The maximum and probability (BTL and Logit) models were then used to estimate the market share or value that clusters associated with each hypothetical product included in the simulation analyses. Although the maximum utility model assumed respondents only chose products with the highest predicted utility score, the probability models assumed respondents rarely made decisions using such precise notions of utility (Hair *et al*., 1998). The stimulant beverages, StimBev 1 to StimBev 4, presented in Table 11.5.1 were generated from an analysis of both the qualitative and quantitative research, and from discussions with the technical partners involved in this multi-disciplinary project. The competitor beverages, StimBev 5 to StimBev 6, represented beverages that were available on the Irish market. The group level simulation analysis revealed different preferences for soft drinks. In Table 11.5.2 the highest and lowest preference scores are in bold and italic respectively. The conjoint models predicted that Clusters 1 and 3 would most prefer stimulant beverages, although both clusters were expected to exhibit different preferences in terms of the flavour attribute level, and this corresponded with the

Table 11.5.1 Soft Drinks Presented for Group Level Simulation Analysis Across Clusters

Attributes	StimBev 1	StimBev 2	StimBev 3	StimBev 4	StimBev 5	StimBev 6
Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand
Flavour	Orange Juice & Spring Water	Orange Juice & Spring Water	Apple Juice & Spring Water	Apple Juice & Spring Water	Orange Juice & Spring Water	Apple Juice & Spring Water
Carbonation Level	Still (Non-carbonated)	Still (Non-carbonated)	Still (Non-carbonated)	Still (Non-carbonated)	Still (Non-carbonated)	Still (Non-carbonated)
Added Ingredients	B Vitamins, Ginseng and Guarana	B Vitamins, Caffeine and Taurine	B Vitamins, Ginseng and Guarana	B Vitamins, Caffeine and Taurine	Non-functional	Non-functional
Packaging Type	Glass Bottle	Glass Bottle	Glass Bottle	Glass Bottle	Plastic Bottle	Plastic Bottle
Price	€2.15 per 250ml	€2.15 per 250ml	€2.15 per 250ml	€2.15 per 250ml	€1.25 per 250ml	€1.25 per 250ml

Table 11.5.2 Group Level Simulation Analysis of Soft Drinks Across Clusters

Simulation Summary	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Preference Scores (rated from 1 to 9)					
StimBev 1	**6.9**	*4.5*	4.5	4.2	1.8
StimBev 2	4.5	4.5	*3.2*	4.6	*1.5*
StimBev 3	6.7	4.5	**4.5**	*1.9*	2.5
StimBev 4	4.3	4.6	3.3	2.3	2.2
StimBev 5	4.5	5.2	4.1	**5.4**	7.2
StimBev 6	*4.3*	**5.3**	4.1	3.1	**7.9**
Max. Utility					
StimBev 1	100%	0%	0%	0%	0%
StimBev 2	0%	0%	0%	0%	0%
StimBev 3	0%	0%	100%	0%	0%
StimBev 4	0%	0%	0%	0%	0%
StimBev 5	0%	0%	0%	100%	0%
StimBev 6	0%	100%	0%	0%	100%
BTL					
StimBev 1	21.99%	15.67%	18.82%	19.74%	7.73%
StimBev 2	14.47%	15.76%	13.54%	21.55%	6.55%
StimBev 3	21.40%	15.91%	19.05%	8.67%	10.86%
StimBev 4	13.88%	16.00%	13.77%	10.48%	9.68%
StimBev 5	14.42%	18.21%	17.29%	25.32%	31.03%
StimBev 6	13.83%	18.45%	17.53%	14.25%	34.16%
Logit					
StimBev 1	45.86%	11.80%	24.50%	15.79%	0.15%
StimBev 2	4.39%	12.13%	7.03%	23.30%	0.11%
StimBev 3	38.16%	12.64%	25.88%	1.46%	0.30%
StimBev 4	3.66%	12.99%	7.43%	2.16%	0.23%
StimBev 5	4.33%	24.35%	17.09%	52.44%	32.35%
StimBev 6	3.60%	26.08%	18.06%	4.85%	66.87%

maximum utility, BTL and Logit values for these two segments (See Table 11.5.2). Cluster 1 was expected to most prefer StimBev 1 (mean score 6.9 out of 9) that was described in Table 11.5.1 as a new brand of juice drink made from a blend of pure

orange juice and still spring water. StimBev 1 contained B Vitamins and natural energy-boosting ginseng and guarana and retailed at €2.15 per 250ml glass bottle. Cluster 1 was expected to least like the non-functional apple juice drink StimBev 6 (mean score 4.3 out of 9). Cluster 3 was predicted to most prefer StimBev 3 that was described as an apple juice-based variant of StimBev 1 (See Tables 11.5.1 and 11.5.2). However, Cluster 3 was expected to least like the stimulant beverage StimBev 2 (mean score 3.2 out of 9). The conjoint models predicted that Clusters 2, 4 and 5 would purchase non-functional juice drinks over stimulant juice drinks (See Table 11.5.2). Cluster 4 was predicted to most prefer StimBev 5, which was described as a familiar branded still orange juice drink that retailed at €1.25 per 250ml plastic bottle. Clusters 2 and 5 were predicted to most prefer StimBev 6 (See Tables 11.5.1 and 11.5.2).

Group Level Simulation Analysis for Cluster 1

The group level simulation analysis within clusters made it possible to identify new functional beverage concepts that could be developed specifically for each cluster in a market-oriented fashion. In Table 11.5.3 the highest preference score is in bold and the lowest preference score is in italic. The conjoint models predicted that Cluster 1 would most prefer the stimulant beverage StimBev 7 (mean score 7.9 out of 9) (See Table 11.5.3). This beverage was described as a new brand of juice drink made from a blend of pure orange juice and sparkling spring water. StimBev 7 contained B Vitamins and natural energy-boosting ginseng and guarana and retailed at €1.70 per 250ml glass bottle. The group level simulation analysis within clusters allowed trade-offs between both product attributes and attribute levels to be studied. For example, an increase in price from €1.70 per 250ml (StimBev 7) to €2.15 per 250ml (StimBev 8) also gave a high predicted preference score (mean score 7.7 out of 9). Functionality was most important to this cluster, in terms of its purchase preferences, and the conjoint models predicted that members of Cluster 1 would not make trade-offs between functionality and price. Specifically, Cluster 1 was expected to give greater preference to a stimulant juice drink that contained B Vitamins, ginseng and guarana, which retailed at €2.15 per 250ml (StimBev 8) (mean score 7.7 out of 9) than a stimulant juice drink that contained B Vitamins, caffeine and taurine, which retailed at €1.70 per 250ml (StimBev 9) (mean score 5.6 out of 9), according to the predicted preference scores and probability (BTL and Logit) models (See Table 11.5.3). This segment was

Table 11.5.3 Group Level Simulation Analysis of Stimulant Beverages for Cluster 1

Attributes	StimBev 7	StimBev 8	StimBev 9	StimBev 10	StimBev 11	StimBev 12
Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand
Flavour	Orange Juice & Spring Water	Orange Juice & Spring Water	Orange Juice & Spring Water	Apple Juice & Spring Water	Orange Juice & Spring Water	Apple Juice & Spring Water
Carbonation Level	Sparkling (Carbonated)	Sparkling (Carbonated)	Sparkling (Carbonated)	Sparkling (Carbonated)	Still (Non-carbonated)	Still (Non-carbonated)
Added Ingredients	B Vitamins, Ginseng and Guarana	B Vitamins, Ginseng and Guarana	B Vitamins, Caffeine and Taurine	B Vitamins, Ginseng and Guarana	Non-functional	Non-functional
Packaging Type	Glass Bottle	Glass Bottle	Glass Bottle	Glass Bottle	Plastic Bottle	Plastic Bottle
Price	€1.70 per 250ml	€2.15 per 250ml	€1.70 per 250ml	€1.70 per 250ml	€1.25 per 250ml	€1.25 per 250ml
Pref. Score	**7.9**	7.7	5.6	7.7	4.5	*4.3*
Max. Utility	100%	0%	0%	0%	0%	0%
BTL	20.97%	20.44%	14.75%	20.48%	11.93%	11.44%
Logit	35.61%	29.20%	3.41%	29.63%	1.18%	0.98%

also predicted to prefer StimBev 8 to the non-functional beverages StimBev 11 and StimBev 12, both of which retailed at €1.25 per 250ml. However, the simulation analysis revealed that Cluster 1 would make trade-offs between flavour and price. Specifically, this segment was predicted to give equal preference to both StimBev 8 and StimBev 10 (an apple juice-based variant of StimBev 8 retailing at €1.70 per 250ml) (See Table 11.5.3). The conjoint models predicted that this segment would least like the non-functional juice drink StimBev 12 (mean score 4.3 out of 9) which was described in Table 11.5.3 as a familiar branded still apple juice drink that retailed at €1.25 per 250ml plastic bottle.

Group Level Simulation Analysis for Cluster 2

The group level simulation analysis revealed that Cluster 2 was expected to exhibit different preferences for stimulant beverages to Cluster 1. In Table 11.5.4 the highest preference score is in bold and the lowest preference score is in italic. The conjoint models predicted that Cluster 2 would most prefer the stimulant beverage StimBev 13 (mean score 6.4 out of 9) (See Table 11.5.4). This beverage was described as a new brand of juice drink made from a blend of pure apple juice and still spring water. StimBev 13 contained B Vitamins, caffeine and taurine and retailed at €1.25 per 250ml plastic bottle. Although StimBev 13 yielded the highest predicted preference score for Cluster 2, this new stimulant beverage concept might not be commercially feasible, for a functional fruit juice-based stimulant beverage, owing to its very low (€1.25 per 250ml) retail price. Consequently, the group level simulation analysis was used to determine whether respondents in Cluster 2 were willing to make trade-offs between product attributes and attribute levels. In Table 11.4.1 it was shown that Cluster 2 was price sensitive in comparison to Clusters 1, 3 and 4. Not surprisingly, the conjoint models predicted that this segment was willing to make trade-offs between functionality, flavour and price. The simulation analysis showed that, for Cluster 2, an increase in price from €1.25 per 250ml (StimBev 13) to €1.70 per 250ml (StimBev 15) would yield a lower predicted preference score (mean score 6.0 out of 9). However, when the price was increased further from €1.70 per 250ml (StimBev 15) to €2.15 per 250ml (StimBev 17) the predicted preference score differential between StimBev 15 and StimBev 17 was striking (mean score 5.1 out of 9). It was predicted that this segment would prefer StimBev 16 (mean score 5.9 out of 9), a functional variant of StimBev 13 that contained B Vitamins, ginseng and guarana and

Table 11.5.4 Group Level Simulation Analysis of Stimulant Beverages for Cluster 2

Attributes	StimBev 13	StimBev 14	StimBev 15	StimBev 16	StimBev 17	StimBev 18	StimBev 19
Brand	New Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand
Flavour	Apple Juice & Spring Water	Lemon & Lime Flavour	Apple Juice & Spring Water	Apple Juice & Spring Water	Apple Juice & Spring Water	Apple Juice & Spring Water	Lemon & Lime Flavour
Carbonation Level	Still (Non-carbonated)	Still (Non-carbonated)	Still (Non-carbonated)	Still (Non-carbonated)	Still (Non-carbonated)	Still (Non-carbonated)	Sparkling (Carbonated)
Added Ingredients	B Vitamins, Caffeine and Taurine	B Vitamins, Caffeine and Taurine	B Vitamins, Caffeine and Taurine	B Vitamins, Ginseng and Guarana	B Vitamins, Caffeine and Taurine	Non-functional	B Vitamins, Caffeine and Taurine
Packaging Type	Plastic Bottle	Plastic Bottle	Plastic Bottle	Plastic Bottle	Plastic Bottle	Plastic Bottle	Aluminium Can
Price	€1.25 per 250ml	€1.25 per 250ml	€1.70 per 250ml	€1.70 per 250ml	€2.15 per 250ml	€1.25 per 250ml	€1.70 per 250ml
Pref. Score	**6.4**	6.2	6.0	5.9	5.1	5.3	*4.2*
Max. Utility	100%	0%	0%	0%	0%	0%	0%
BTL	16.39%	15.89%	15.24%	15.17%	13.14%	13.47%	10.69%
Logit	26.37%	21.68%	16.85%	16.40%	7.42%	8.43%	2.84%

retailed at €1.70 per 250ml, to StimBev 17 that retailed at €2.15 per 250ml (See Table 11.5.4). In this instance, the simulation analysis also revealed that Cluster 2 was willing to make trade-offs between flavour and price. Specifically, Cluster 2 was expected to give greater preference to StimBev 14 (mean score 6.2 out of 9), a lemon and lime flavoured variant of StimBev 13 that retailed at €1.25 per 250ml, than fruit juice-based variants that retailed at a higher price (See Table 11.5.4). The conjoint models predicted that this segment would least like the stimulant beverage StimBev 19 (mean score 4.2 out of 9).

Group Level Simulation Analysis for Cluster 3

The group level simulation analysis within clusters made it possible to identify new functional beverage concepts that could be developed specifically for Cluster 3 in a market-oriented fashion. In Table 11.5.5 the highest preference score is in bold and the lowest preference score is in italic. The conjoint models predicted that Cluster 3 would most prefer the stimulant beverage StimBev 20 (mean score 5.5 out of 9) (See Table 11.5.5). This beverage was described as a new branded sparkling lemon and line flavoured soft drink. It contained B Vitamins and natural energy-boosting ginseng and guarana, and retailed at €1.25 per 250ml glass bottle. The group level simulation analysis made it possible to study what trade-offs, if any, Cluster 3 would make between the attribute levels of functionality and price. It was shown in Table 11.4.1 that this segment was negative towards stimulant drinks that contained B Vitamins, caffeine and taurine. Not surprisingly, StimBev 21, a functional variant of StimBev 20, was predicted to yield a lower preference score (mean score 4.2 out of 9) than StimBev 20. In particular, the analysis showed that Cluster 3 was expected to prefer the non-functional beverage StimBev 22 (mean score 5.0 out of 9) over StimBev 21. The simulation analysis also revealed that Cluster 3 was unwilling to make trade-offs between functionality and price. Specifically, Cluster 3 was willing to pay a higher price (€1.70 per 250ml) for StimBev 23 than either StimBev 21 (€1.25 per 250ml) or StimBev 22 (€1.25 per 250ml) (See Table 11.5.5). The conjoint models showed that Cluster 3 would least like the stimulant beverage StimBev 26 (mean score 3.9 out of 9).

Table 11.5.5 Group Level Simulation Analysis of Stimulant Beverages for Cluster 3

Attributes	StimBev 20	StimBev 21	StimBev 22	StimBev 23	StimBev 24	StimBev 25	StimBev 26
Brand	New Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand	Familiar Brand
Flavour	Lemon & Lime Flavour	Lemon & Lime Flavour	Lemon & Lime Flavour	Lemon & Lime Flavour	Orange Juice & Spring Water	Apple Juice & Spring Water	Lemon & Lime Flavour
Carbonation Level	Sparkling (Carbonated)	Sparkling (Carbonated)	Sparkling (Carbonated)	Sparkling (Carbonated)	Still (Non-carbonated)	Still (Non-carbonated)	Sparkling (Carbonated)
Added Ingredients	B Vitamins, Ginseng and Guarana	B Vitamins, Caffeine and Taurine	Non-functional	B Vitamins, Ginseng and Guarana	Non-functional	Non-functional	B Vitamins, Caffeine and Taurine
Packaging Type	Glass Bottle	Glass Bottle	Glass Bottle	Glass Bottle	Plastic Bottle	Plastic Bottle	Aluminium Can
Price	€1.25 per 250ml	€1.25 per 250ml	€1.25 per 250ml	€1.70 per 250ml	€1.25 per 250ml	€1.25 per 250ml	€1.70 per 250ml
Pref. Score	**5.5**	4.2	5.0	5.3	4.1	4.1	*3.9*
Max. Utility	100%	0%	0%	0%	0%	0%	0%
BTL	17.11%	13.22%	15.49%	16.46%	12.75%	12.92%	12.05%
Logit	29.41%	8.45%	17.52%	23.86%	7.27%	7.68%	5.81%

Group Level Simulation Analysis for Cluster 4

The group level simulation analysis revealed that Cluster 4 was expected to exhibit different preferences for stimulant beverages to Clusters 1, 2 and 3. In Table 11.5.6 the highest preference score is in bold and the lowest preference score is in italic. The conjoint models predicted that Cluster 4 would most prefer the non-functional juice drink StimBev 27 (mean score 6.9 out of 9) (See Table 11.5.6). This beverage was described as a familiar brand of juice drink made from a blend of pure orange juice and sparkling spring water, which retailed at €1.25 per 250ml aluminium can. A new branded variant, StimBev 28, also gave a high predicted preference score (mean score 6.6 out of 9). The conjoint models showed that Cluster 4 would least like the non-functional juice drink StimBev 32 (mean score 3.1 out of 9).

Group Level Simulation Analysis for Cluster 5

The group level simulation analysis showed that Cluster 5 exhibited similar preferences to Cluster 4 in terms of its preference for non-functional juice drinks. In Table 11.5.7 the highest preference score is in bold and the lowest preference score is in italic. The simulation analysis predicted that Cluster 5 would most prefer the non-functional juice drink StimBev 34 (mean score 8.1 out of 9) (See Table 11.5.7). This beverage was described as a familiar brand of juice drink made from a blend of pure apple juice and still spring water, and retailed at €1.25 per 250ml glass bottle. This cluster was most negative towards stimulant beverages as shown in Table 11.4.1. Not surprisingly therefore, the conjoint models predicted that Cluster 5 would least like the stimulant beverages StimBev 36 (mean score 2.5 out of 9) and StimBev 37 (mean score 2.6 out of 9) (See Table 11.5.7).

11.6 Summary

This chapter presented the results of a conjoint analysis study that investigated purchasers' preferences for a range of new stimulant beverages. This market-oriented approach to NPD identified the most important product design attributes that influenced purchasers' preferences for new soft drinks. Overall, purchasers identified added ingredients, flavour, type of packaging and price as the most important attributes that influenced their purchase behaviour towards soft drinks. However, k-means cluster analysis identified five distinct market segments with different preferences for soft drinks. Three of the five clusters identified in this study, Clusters

Table 11.5.6 Group Level Simulation Analysis of Stimulant Beverages for Cluster 4

Attributes	StimBev 27	StimBev 28	StimBev 29	StimBev 30	StimBev 31	StimBev 32	StimBev 33
Brand	Familiar Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand	Familiar Brand
Flavour	Orange Juice & Spring Water	Orange Juice & Spring Water	Lemon & Lime Flavour	Orange Juice & Spring Water	Orange Juice & Spring Water	Apple Juice & Spring Water	Lemon & Lime Flavour
Carbonation Level	Sparkling (Carbonated)	Sparkling (Carbonated)	Sparkling (Carbonated)	Sparkling (Carbonated)	Still (Non-carbonated)	Still (Non-carbonated)	Sparkling (Carbonated)
Added Ingredients	Non-functional	Non-functional	B Vitamins, Caffeine and Taurine	B Vitamins, Ginseng and Guarana	Non-functional	Non-functional	B Vitamins, Caffeine and Taurine
Packaging Type	Aluminium Can	Aluminium Can	Aluminium Can	Aluminium Can	Plastic Bottle	Plastic Bottle	Aluminium Can
Price	€1.25 per 250ml	€1.25 per 250ml	€1.25 per 250ml	€1.70 per 250ml	€1.25 per 250ml	€1.25 per 250ml	€1.70 per 250ml
Pref. Score	**6.9**	6.6	4.3	6.1	5.4	*3.1*	4.6
Max. Utility	100%	0%	0%	0%	0%	0%	0%
BTL	18.65%	17.88%	11.58%	16.47%	14.75%	8.30%	12.37%
Logit	38.06%	28.59%	2.79%	17.00%	9.00%	0.83%	3.73%

Table 11.5.7 Group Level Simulation Analysis of Stimulant Beverages for Cluster 5

Attributes	StimBev 34	StimBev 35	StimBev 36	StimBev 37	StimBev 38	StimBev 39
Brand	Familiar Brand	New Brand	New Brand	New Brand	Familiar Brand	Familiar Brand
Flavour	Apple Juice & Spring Water	Apple Juice & Spring Water	Lemon & Lime Flavour	Apple Juice & Spring Water	Orange Juice & Spring Water	Apple Juice & Spring Water
Carbonation Level	Still (Non-carbonated)	Still (Non-carbonated)	Still (Non-carbonated)	Still (Non-carbonated)	Still (Non-carbonated)	Still (Non-carbonated)
Added Ingredients	Non-functional	Non-functional	B Vitamins, Caffeine and Taurine	B Vitamins, Ginseng and Guarana	Non-functional	Non-functional
Packaging Type	Glass Bottle	Glass Bottle	Glass Bottle	Glass Bottle	Plastic Bottle	Plastic Bottle
Price	€1.25 per 250ml	€1.25 per 250ml	€1.25 per 250ml	€1.70 per 250ml	€1.25 per 250ml	€1.25 per 250ml
Pref. Score	**8.1**	7.5	*2.5*	2.6	7.2	7.9
Max. Utility	100%	0%	0%	0%	0%	0%
BTL	22.63%	20.94%	6.93%	7.38%	20.05%	22.07%
Logit	36.17%	19.71%	0.13%	0.15%	14.29%	29.54%

1, 2 and 3, exhibited preferences for stimulant beverages. The group level simulation analysis within clusters then helped identify new stimulant beverage concepts that could be targeted more effectively at the three potential market segments identified in the study. Part V presents the overall conclusions and recommendations of this study. In Chapter 12 the conclusions, recommendations and suggestions for further research are presented.

PART V: CONCLUSIONS AND RECOMMENDATIONS

Chapter 12: Research Conclusions and Recommendations

12.1 Introduction

This chapter presents the conclusions and recommendations of the research. The key conclusions derived from both the qualitative and quantitative elements of the research are discussed together under a number of important headings. These include: product specificity for evaluating new functional beverage concepts; a market-oriented approach to concept optimisation and new product design; strategic orientations for the functional beverages market; leveraging a competitive advantage for functional beverages; and optimal pricing strategies for novel functional beverages. The overall conclusions drawn from the explorative and segmentation elements to the research are then presented which address the research question guiding this study. Finally, recommendations to stakeholders in the functional food and beverages market are presented, and suggestions for further research are proposed based upon topics of interest that require further investigation.

12.2 Research Conclusions and Discussion

Product development is widely considered an essential strategy or activity that firms must engage in to remain competitive in the marketplace. However, strategic reviews of the Irish Food Industry have repeatedly emphasised the need for firms to invest in technological and marketing capabilities, in order to manage risk and enhance competitiveness. In particular, the functional food and beverages market has been singled out as an extremely significant emerging market that Irish firms can benefit from through investment in both technological and marketing capabilities. Although NPD represents an extremely important growth factor for Irish food and beverage firms, the failure rates associated with new food product development worldwide are reportedly high. In that context, a review of the extant NPD literature identified four key factor groupings for new product success, and these included: the adoption and implementation of an NPD strategy; a formal multi-disciplinary NPD process; knowledge management; and market orientation. The literature revealed that the adoption and implementation of an NPD strategy was associated with success in

product development, as it gave NPD teams a clear and realistic target, and focused the NPD process towards the strategic direction of the firm (Tzokas *et al*., 2003; Bacon *et al*., 1994). In terms of operationalisation of the NPD function, Hart and Baker (1996) concluded that a structured NPD process facilitated the detection of problems associated with concepts in the early stages of the NPD process, and fostered a multi-disciplinary approach to NPD. In particular, the NPD literature emphasised market orientation's positive influence on information generation, dissemination and inter-departmental co-coordination, which was strongly linked with improved knowledge management, organisational efficiency and profitability.

This research explored the concept of managing customer knowledge at the early stages of the NPD process, and applied it to the development of a range of functional beverages, through the use of advanced concept optimisation research techniques, namely in-depth interviews, focus groups, and conjoint analysis. This market-oriented approach to NPD facilitated the integration of the customer at the early or concept stage of the NPD process. The integration of the customer during the concept stage of the NPD process through in-depth interviews and focus groups provided a valuable insight into customers' attitudes and perceptions towards innovative functional beverages. The conjoint analysis technique complemented the qualitative findings as it provided a clearer understanding of customers' cognitive choice motives, and specifically the trade-offs customers would be expected to make between alternative functional and non-functional beverages. Overall, advanced concept optimisation research methods promoted a multi-disciplinary approach to NPD, as marketers and R&D personnel could use the information generated from customers to develop novel functional beverages concepts, in a market-oriented fashion. More importantly, the market-oriented approach to NPD outlined in this study provided for the effective and efficient management of customer knowledge at the early stages of the NPD process. The results from this study also provided new insights into Irish customers' acceptance of functional beverages, with implications for the strategic marketing and technical development of innovative functional beverages by firms. In the following sub-sections, the research sub-questions are initially dealt with, and finally, the main research question guiding this study, which is an amalgam of the individual sub-questions, is addressed in Section 12.3.

Sub-question 1: *What are customers' expectations, requirements and preferences for functional beverages?*

12.2.1 Product Specificity for Evaluating New Functional Beverage Concepts

The functional beverages market has seen high levels of NPD activity in recent years although this has not necessarily been reflected in increased sales or market share, and failure rates for new functional beverage entrants have been high (Heasman and Mellentin, 2001). Advanced concept optimisation research methodologies that help firms understand customers' choice motives and value systems have an extremely significant role to play in new food product development. This research supports the findings of DeJong *et al*. (2003) and Bech-Larsen *et al*. (2001) where customers' purchase intent towards functional foods and beverages, and specific functional ingredients, depends upon the base product selected for enrichment. For example, the qualitative element of this research revealed that the selection of orange juice as a base product or carrier for a range of functional beverages had a profound influence on the new product concepts considered acceptable to customers. Customers' perceptions of orange juice were positive, and orange juice was considered a healthier alternative to other beverages such as carbonated soft drinks. Consequently, only functional juice concepts, functional ingredients and associated benefits, which were perceived as healthy, were considered acceptable by interviewees and focus group participants. The in-depth interviews and focus group discussions revealed the two most preferred functional beverage concepts were the probiotic and nutrient-enriched orange juices. Conversely, purchasers and non-purchasers of stimulant drinks rejected both the stimulant orange juice concept, which they considered less healthy than pure orange juice, and the associated ingredients, which they considered inappropriate for addition to pure orange juice.

Whilst DeJong *et al*. (2003) and Bech-Larsen *et al*. (2001) demonstrated that the base product influenced customers' interest in, and purchase intent towards, functional foods and beverages across product categories, the qualitative aspects of this research revealed that the base product selected also influenced customers' acceptance of specific health benefits within a specific product category such as fruit juice. For example, in the case of the probiotic orange juice concept, the specific selection of orange juice as a vehicle for a range of probiotic juices influenced customers'

preferences for a range of associated health benefits. The inherent benefits associated with orange juice seemed to influence customers' preferences towards a probiotic orange juice that aided the immune or digestive system. In contrast, a number of interviewees and participants in Focus Groups 1 and 2 rejected the concept of a probiotic orange juice designed to prevent diarrhoea. Clearly, from a customer perspective, a contradiction arose between the inherent benefit associated with orange juice, in terms of the alleviation of constipation, and the health benefit associated with a probiotic orange juice developed for the prevention of diarrhoea. Furthermore, a number of customers were opposed to the addition of fibre to a probiotic orange juice given its inherent benefits to the digestive system for the relief or prevention of constipation. On that basis, the parents of young children did not consider pure orange juice an appropriate beverage to offer to infants or very young children.

It had previously been argued by Butler (2002) that calcium fortification no longer presented a competitive advantage to juice manufacturers, and that multi-functionality, in terms of multiple functional ingredients, was an important NPD trend for the future. However, this research revealed that the product selected as a vehicle for a range of functional beverages had a marked influence on the functional ingredients considered acceptable to customers. For example, in relation to the nutrient-enriched functional juice concept, customers considered orange juice to be devoid of fat. Furthermore, customers were negative towards the addition of sugar to orange juice. Consequently, customers rejected a nutrient-enriched functional orange juice that offered the full nutritional benefits of milk. However, in this research, the vast majority of interviewees and focus group participants were receptive towards a nutrient-enriched functional orange juice that offered the full complement of vitamin and minerals associated with milk. Furthermore, the conjoint analysis technique made it possible to determine whether the addition of extra functional ingredients, associated with milk, added value from the customer's perspective. Interestingly, only three clusters (Clusters 1, 4, and 5) expressed a strong preference for chilled nutrient-enriched orange juice that contained the same amount of calcium, protein, vitamins and minerals as milk. In contrast, Cluster 3 most preferred non-functional chilled orange juice, and Cluster 2 did not perceive value from the addition of nutrients beyond calcium fortification. This cluster possibly represented housewives or parents with high food risk aversion and quality consciousness, or possessed positive attitudes

towards the provision of wholesome, nutritious foods or drinks for their children (Verbeke, 2004; Gilbert, 2000). The market-oriented approach to NPD presented in this study also facilitated the identification of market segments that could be targeted with new functional beverages.

Sub-question 2: *What functional beverages appeal to specific market segments?*

12.2.2 Market-oriented Approach to Concept Optimisation and New Product Design

The qualitative and quantitative elements of this research raised a number of important strategic marketing and product design issues for firms pursuing market opportunities in the functional food and beverages market. The conjoint analyses revealed similarities in customers' choice motives for both chilled nutrient-enriched and probiotic orange juice. Specifically, purchasers of chilled orange juice were most influenced by price, added ingredients or health benefits, and the type of juice when choosing between alternative orange juices. Furthermore, a number of segments identified in both studies held negative attitudes, expressed in terms of a negative utility, towards 'not from concentrate' chilled orange juice. The texture and brand attributes were also less important to these purchasers of chilled orange juice. In particular, the in-depth interviews and focus groups revealed that inertia, and indifference, characterised customers' purchase behaviour towards orange juice, and functional orange juices. It appeared that orange juice was a low involvement purchase for many interviewees and focus group discussants. This was most evident by a strong reliance on branding as an indicator of the sensory qualities of orange juice, based upon past experience. However, the majority of interviewees and focus group participants reportedly experimented with new orange juice brands.

The conjoint and cluster analysis techniques pre-determined that a number of market segments existed with different preferences for both chilled nutrient-enriched and probiotic orange juice. Four out of five clusters gave positive utility values for chilled functional orange juice, and three out of five clusters gave positive utility values for stimulant beverages. However, only two segments gave relatively high utility values for functionality in each study. More importantly, the functionality driven segments for chilled nutrient-enriched (Cluster 1) and probiotic (Cluster 4) orange juice were

also more price conscious relative to other clusters in each study. This represents a challenge for NPD practitioners in terms of identifying the optimal product design attributes for new product success in essentially a niche market. Interestingly, the functional driven segments for both chilled nutrient-enriched and probiotic orange juice also exhibited health-related lifestyle behaviours. For stimulant beverages, this research revealed that substituting caffeine and taurine with natural stimulant ingredients such as ginseng and guarana would add value for certain segments (Clusters 1 and 3) of soft drink purchasers. In particular, Cluster 1, the functionality driven segment, which consisted of females and older adults aged 36-39 years represented a new target market beyond the largest customer group, young adults aged 18-24 years, traditionally targeted with energy and stimulant drinks.

This research has future implications for the way in which technology-oriented firms view and assess the market attractiveness of the functional food and beverages market. Specifically, the findings of this research suggest that functional foods and beverages represent a niche market opportunity for firms pursuing a technology-oriented NPD strategy. This is congruent with Wennström and Mellentin's (2003) strategic analysis of the functional food and beverages market where new functional product introductions are viewed as niche products at the early stage of the product lifecycle. In this context, Heasman and Mellentin (2001) stress the importance of identifying and profiling these niche market segments that are lifestyle or needs driven, and perceive value from functional foods and beverages, for new product success. These segments are most willing to make minor trade-offs between functionality and other key product attributes. This research revealed that secondary segmentation variables such as health-related behaviours and family lifestyle stage were important in terms of differentiating between clusters, when customers were segmented and profiled according to user benefit or utility through conjoint and cluster analysis.

However, in order to appeal to mainstream customers, Wennström and Mellentin (2003) argue that firms must develop and market functional foods and beverages that include the following: are comparable with non-functional products from a sensory perspective; communicate the health benefits clearly to customers; build trust; and have a pricing strategy congruent with mass market appeal. Significantly, the market-oriented approach to concept optimisation presented in this research made it possible

to identify the optimal combination of product design attributes, for a range of functional beverages, specifically targeted at a number of potential market segments. The market-oriented approach to NPD presented in this study also provided guidance to firms in terms of suitable communication, positioning and pricing strategies for a range of innovative functional beverages.

Sub-question 3: *Can advanced concept optimisation research methodologies contribute towards effective strategic marketing decisions for functional beverages in Ireland?*

12.2.3 Strategic Orientations for the Functional Beverages Market

This research identified a number of strategies that firms could adopt when entering the functional beverages market with chilled nutrient-enriched and probiotic orange juice, and juice-based stimulant drinks. For example, the research findings suggested that firms could pursue a category substitution[58] strategy for a range of probiotic orange juices. The qualitative research revealed that the probiotic orange juice concept held a significant unique selling point or competitive advantage over probiotic dairy drinks in relation to monetary value, serving size, and sensory pleasure. This view was supported by the findings of the quantitative element to this research. Specifically, Clusters 2 and 4, which expressed the strongest preferences for chilled probiotic orange juices were also heavy purchasers of a range of probiotic products. However, a category substitution strategy for chilled probiotic orange juice would have major implications for small to medium-sized firms as the probiotic dairy drinks and supplements markets are dominated by multi-national food and beverage companies. In particular, the qualitative research also highlighted further considerations, which related to the concentration of probiotic cultures desired by purchasers of probiotic supplements. Indeed, Heasman and Mellentin (2001) argue that the concentration of probiotic cultures will become more important in the future as customers become more aware of the substantive issues relating to the viability of probiotic cultures in foods and beverages.

[58] A strategy of acquiring for your own category the health benefits of another competing category, but offering the health benefits in a more convenient format (Wennström and Mellentin, 2003).

While opportunities exist for beverage manufacturers seeking market opportunities within the functional beverages market, critical challenges await beverage manufacturers pursuing a product substitution strategy with chilled nutrient-enriched orange juice, and stimulant juice-based beverages. Customers were adamant that functional foods and beverages should taste as close to regular foods and beverages, and similar sentiments have been reported elsewhere in relation to functional foods (Newsholme, 2002; Bogue and Sorenson, 2001). In fact, Milton (2003) and Wennström and Mellentin (2003) argued that food and beverage manufacturers had to ensure that customers' basic requirements for the base product were first met if they hoped to satisfy mainstream customers' overall requirements with functional foods and beverages. In particular, Cosgrove (2004) and Foote (2002) noted that even though functional beverages offered health benefits, off-flavours and textural changes, particularly associated with calcium fortification, acted as a deterrent to customer acceptance in the past, particularly when beverages lost their refreshment and pleasure appeal. Similarly, Luckow and Delahunty (2004a; 2004b) and Tuorila and Cardello (2002) noted that off-flavours associated with probiotic bacteria were more pronounced in non-dairy products such as orange juice than in dairy-based foods and beverages. The challenge therefore, for marketers and technical R&D personnel, is to develop functional beverages that deliver the sensory attributes of regular beverages as well as delivering functional benefits. This research identified a number of functional ingredients that could possibly lead to off-flavours from the customers' perspective. Qualitative and quantitative enquiries at the early stages of the NPD process can help identify problems associated with new product concepts and provide guidance to technical R&D personnel in developing functional beverages that gain greater overall customer acceptance.

The qualitative element to the research revealed that processing characteristics were extremely significant in influencing customers' perceptions and purchase intent towards functional beverages. For example, orange juice was generally perceived to be a natural product. For some interviewees, specific attributes such as location in-store, texture, and the type of juice were used to discriminate between juices on the basis of purity and naturalness. Subsequently, some customers expressed the opinion that the addition of functional ingredients lowered the perceived naturalness of orange juice. Such observations have been reported elsewhere (Bech-Larsen *et al*., 2001). Heasman

and Mellentin (2001) remarked that numerous studies showed functional foods were perceived as less healthy than organic or conventional fresh foods. Generally, focus group participants were more accepting of functional orange juices with selective rather than multiple nutrients, although participants' negative attitudes towards multi-functionality were more pronounced for probiotic than nutrient-enriched beverages. Generally, the findings from this research would suggest that the technical development and market positioning of functional orange juices on a '*natural*' platform would be an important strategy decision for firms. This strategy is based upon customers' perceptions and expectations of pure orange juice. Similarly, the findings from the qualitative and quantitative elements of this research would suggest that firms should pursue a positioning strategy that emphasises refreshment and naturalness for stimulant juice-based beverages.

Hollingsworth (2001) asserted that the lack of permissible health claims made it difficult for functional food and beverage manufacturers to effectively communicate the health benefits afforded by certain functional foods and beverages to customers. The findings of this research suggest that the use of nutritional information and health claims should not be relied upon primarily to communicate health benefits associated with functional juices to customers. This suggestion is based upon the general disinterest shown by interviewees and focus group participants in both nutritional and label information. Instead, firms could pursue promotional techniques that help communicate the benefits associated with functional juices to customers. This could possibly aid customers in differentiating functional juices from conventional ones. Such promotional techniques could include in-store education of customers and the use of health and nutritional information leaflets. More traditional promotional tools such as advertising and promotional offers could also be used.

In the case of the chilled nutrient-enriched functional orange juice, this research highlighted the importance of informing customers about nutritional inadequacies, particularly in relation to dairy product consumption and calcium intake (National Nutrition Surveillance Centre, 1999). Such a strategy would be of particular benefit to functional juice manufacturers wishing to attract those customers, which perceive their dietary intake of dairy products and calcium to be adequate, towards chilled nutrient-enriched functional orange juice. In this study, customers placed considerable

importance on the sensory attributes of orange juice in influencing their purchase decisions. A promotional tool such as product sampling would allow customers to experience a functional orange juice from a sensory perspective. It could possibly have a positive impact on a target customer group's propensity to experiment with new functional orange juice brands. Given that functional juices are located alongside conventional juices, promotional strategies that aim to increase a product's visibility in the supermarket have an extremely significant role to play in the development of the functional orange juice market. At present, it would appear that functional juices remain undifferentiated from incumbent products.

12.2.4 Leveraging a Competitive Advantage for Functional Beverages

An important trend highlighted by Leatherhead Food Research Association (2004b; 2002a) concerned the growing market for both premium chilled juices and functional juice-based beverages. In particular, Longman (2001) linked increased NPD activities in functional foods and beverages amongst both manufacturers and retailers to high levels of concentration within food markets, the inability of the general healthy foods market to develop and maintain premiums, and changing customer preferences. However, Harmsen (1994) argued that central to innovation was the need for a firm to develop a product that gave a perceived value to customers, higher than that of their competitors. For example, beverage manufacturers, and more recently retailers, have focused on the type of juice, and 'not from concentrate' juice in particular, as an extremely significant marketing tool to differentiate their product offering from their competitors, in order to gain an increased market share in the premium chilled juice category. However, the findings from this research suggest that beverage manufacturers have yet to effectively differentiate between the types of juice sub-categories. This view is based upon the negative perception of the 'not from concentrate' descriptor expressed by some purchasers of chilled orange juice, and customers' poor understanding of the different types of juice (Sorenson and Bogue, 2005; Mintel, 1998).

On that basis, it could be argued that *Tropicana's* brand equity will constrain the development of the 'not from concentrate' chilled juice category, in terms of increased market share of either new market entrants, or competitors presently on the market. Therefore, differentiating between the types of juice sub-categories may become an

increasingly important element of the communication and positioning strategies of both beverage firms and retailers in the future, when seeking market opportunities for chilled probiotic and nutrient-enriched orange juice beverages, which are positioned on a platform that emphasises naturalness and general well-being. Similarly, beverage manufacturers have also focused on the base product, and the fruit content in particular, as an extremely significant marketing tool to differentiate their product offering from their competitors, in order to gain an increased market share in both the soft drink and functional beverage categories. This research revealed that increasing the juice content in stimulant soft drinks would add more value for certain segments such as Clusters 1 and 2 that found stimulant beverages appealing. Differentiating between stimulant beverages, in terms of the juice content, can form an integral part of a beverage firm's positioning strategy when seeking market opportunities for fruit juice-based stimulant beverages, which are positioned on a platform that emphasises functional refreshment and naturalness.

With increasingly competitive markets, functional food and beverage manufacturers have targeted functionality, vis-à-vis the health benefits offered, as an extremely important marketing tool in creating value and a competitive advantage in order to differentiate their product offering from their competitors (Heasman and Mellentin, 2001). Consequently, based upon recent product launches, Leatherhead Food Research Association (2004b; 2002a) predicted that future innovations in both the nutrient-enriched and probiotic food and beverages markets would focus on multi-functional products that offered multiple benefits. However, the qualitative research findings revealed a high level of inertia amongst interviewees and focus group participants towards both the concept of adding functional ingredients to foods or beverages, and the functional beverage concepts evaluated in this study. In this research, interviewees' attitudes towards multi-functional beverages differed from the opinions held by focus group participants. For example, economic considerations were important to interviewees in choosing multi-functional nutrient-enriched and probiotic orange juices over both calcium-enriched and probiotic orange juices that offered singular benefits respectively. In contrast, some participants in Focus Groups 1 and 2 stated that they would purchase a calcium-enriched orange juice over a multi-functional orange juice that offered the full nutritional benefits of milk. This was

based upon the perceived purity and naturalness of orange juice, and was consistent with the findings of Bech-Larsen *et al*. (2001).

Similarly, a number of participants in Focus Groups 1 and 2 were sceptical towards a multi-functional probiotic orange juice, and as a consequence of the social interaction between participants, consensus was reached in both focus groups in favour of a probiotic orange juice that claimed to aid either the immune system or the digestive system. This is what Schindler (1992) referred to as the unique ability of focus groups to predict the effects of social influence. A multi-functional strategy may very well be more attractive to pursue for probiotic beverages in more competitive and maturing markets, such as the Japanese market, where customers are highly aware of the links between certain dietary components and a reduced risk from certain diseases. However, the results of the explorative element to this research suggest that, in the short term, a probiotic orange juice offering a singular benefit may present a lower risk in terms of new product failure than a multi-functional probiotic orange juice. This could possibly be based in part upon the relatively low but growing market share for probiotic products in Ireland, customers limited exposure to multi-functional products, and their limited understanding and acceptance of the diverse health-enhancing properties of probiotic cultures, and other synergistic functional ingredients (Bogue *et al*., 2005b). The qualitative research findings presented in this study highlighted the significance of efficacy in the validation of physiological claims in terms of the communication and education of customers on the benefits associated with functional foods and beverages. As Hollingsworth (2001: 60) noted: "*unless the customer is able to see a difference, unless there is some objective measure, unless they feel better, unless some negative symptom disappears, they are not likely to stay with the product*".

The quantitative element to this research showed that functionality was not as important to purchasers of either chilled orange juice or soft drinks, in terms of purchase motivations or value systems, as manufacturers and retailers have been led to believe (Jonas and Beckmann, 1998). Specifically, this research revealed that a market segment existed, in each conjoint-based study, that was functionality driven in terms of purchase preferences. However, the majority of purchasers of chilled orange juice and soft drinks were motivated by other extrinsic attributes such as price, or intrinsic

attributes such as flavour. For example, the simulation analysis conducted for each conjoint-based study revealed that most market segments would make some form of trade-off between intrinsic attributes associated with the base product, functionality and price. Overall, these findings were congruent with Wennström and Mellentin's (2003) strategic analysis of the healthy foods market, and explained the niche market appeal of functional foods and beverages presently.

Interestingly, Longman (2001) also linked the apparent increase in demand for functional foods and beverages to customers' negative perceptions towards healthy foods, and lighter foods in particular, in relation to trade-offs in terms of health benefits and sensory character. However, the findings from this research concur with those of DeJong *et al*. (2003) and Bech-Larsen *et al*. (2001) where a greater emphasis needs to be placed on the carrier or base product when developing new functional food and beverages. More so, Foote (2002) and Brandt (2000) reiterated that off-flavours associated with functional ingredients often acted as a deterrent to customer acceptance of functional beverages, and the qualitative research identified a number of functional ingredients that could possibly lead to off-flavours from the customers' perspective. Milton (2003) agreed that food and beverage manufacturers had to meet customers' basic requirements for the base product first if they hoped to satisfy customers' overall requirements with functional foods or beverages. This research demonstrated how advanced concept optimisation research techniques at the early stages of the NPD process could help identify problems associated with new product concepts, and could provide guidance to marketers and technical R&D personnel when developing functional beverages. Only then can the health benefits associated with a functional food or beverage be used as a marketing tool to successfully leverage a competitive advantage in the marketplace.

12.2.5 Optimal Pricing Strategies for Novel Functional Beverages

Dunn (2005) and Heasman and Mellentin (2001) argued that the poor performance of functional foods and beverages could be attributed to the pursuance of a mass-marketed product through a premium pricing strategy. Consequently, Heasman and Mellentin (2001) and Herrmann *et al*. (2000) argued that it was essential for firms to identify the optimal price that customers would be willing to pay for a functional food or beverage. In that context, the simulation analysis within clusters made it possible to

determine whether customers would be willing to trade-up or make trade-offs between key intrinsic attributes, functionality and price. In the case of chilled nutrient-enriched orange juice, the simulation analysis within clusters revealed that both segments (Clusters 1 and 5) that most preferred chilled freshly squeezed functional orange juice would make trade-offs between the type of juice and price. Specifically, Clusters 1 and 5 would substitute chilled freshly squeezed nutrient-enriched orange juice priced at €2.80 with chilled 'made from concentrate' nutrient-enriched orange juice priced at €1.90. Furthermore, Cluster 1, which preferred multiple nutrients to calcium fortification alone, would be expected to make trade-offs between functionality and price. This segment would substitute a chilled multi-nutrient freshly squeezed orange juice priced at €3.70 with a chilled calcium-enriched freshly squeezed orange juice that retailed at €2.80.

Similarly, two of the four clusters that most preferred chilled freshly squeezed probiotic orange juice would be expected to make trade-offs between the type of juice and price. Specifically, Clusters 2 and 3 would be expected to substitute chilled freshly squeezed probiotic orange juice priced at €2.80 with chilled 'made from concentrate' probiotic orange juice that retailed at €1.90. In contrast, only one of the three clusters, Cluster 2, which preferred stimulant beverages to regular soft drinks would make trade-offs between flavour, functionality and price. Specifically, Cluster 2 would be expected to substitute a fruit juice-based stimulant drink that contained caffeine and taurine at €1.70 with a fruit flavoured stimulant drink that contained caffeine and taurine at €1.25. Similarly, Cluster 2 would also be expected to substitute a fruit juice-based stimulant drink that contained caffeine and taurine at €2.15 with a fruit juice-based stimulant drink that contained ginseng and guarana at €1.70.

Overall, customers appeared more price sensitive and more likely to make trade-offs when purchasing chilled functional orange juice, and appeared less price sensitive when purchasing functional soft drinks. In fact, Cherkassky (2001: 18) reports, "*the good news for soft drinks is that price doesn't matter when it comes to cold channel, because here, again, the key is availability. The cold channel is all about indulgence and convenience*". This research revealed that three out of five clusters gave positive utility scores for both medium-priced chilled nutrient-enriched and probiotic orange juices. In contrast, four out of five clusters gave positive utility values for medium

priced stimulant soft drinks. This would suggest that the optimal pricing strategy or premium that customers would be willing to pay for a functional beverage could possibly vary across product categories. This research concludes that an optimal pricing strategy or premium should be identified and determined according to both customers' choice motives, as well as the product category selected for enrichment with functional ingredients, in order to maximise returns when bringing new functional beverages to the market. Overall, market-oriented research methodologies such as conjoint analysis can help firms identify, and understand, the interactions and relationships driving purchasers' choice motives for specific functional foods and beverages. This in turn can assist food and beverage manufacturers in identifying the optimal product design attributes, and associated optimal price or premium that customers would be willing to pay for added functional ingredients to foods and beverages, in a market-oriented fashion.

Finally, the functional food and beverages market should be viewed more as a long-term strategy for future growth and less as a short-term strategy for high profitability, owing to the niche market nature of the functional food and beverages market presently. It was emphasised in the literature that firms who viewed the functional food and beverages market as a long-term strategy also invested significant resources in terms of promotion and communication strategies, as well as corporate and product positioning strategies. Integrating the customer at the early stages of the NPD process, through the use of advanced concept optimisation research methodologies, can assist firms with strategic marketing decisions for innovative functional beverages. The information generated from this research can assist firms when making strategic marketing decisions including positioning, communication, and pricing strategies for new functional beverages.

12.3 Overall Conclusions

The overall research question that guided this study was: *To what extent can the effective knowledge management process assist firms exploit market opportunities for functional beverages in Ireland*?

New food product development is a multi-disciplinary knowledge intensive process, which necessitates the generation, dissemination and management of knowledge

across all functions involved in the development of new foods and beverages. The early stages of the NPD process in particular represent extremely critical stages for managing knowledge of both internal technological capabilities and external measures of customers' needs. The increasingly competitive nature of the functional food and beverages market, and the inherent risks associated with the new food product development process, highlight the significance of knowledge management to the NPD process. A market-oriented approach to NPD that facilitates the effective and efficient management of customer knowledge represents an essential strategic orientation for firms pursuing market opportunities in the functional food and beverages market. This research explored the concept of managing customer knowledge at the early stages of the NPD process, and applied it to the development of a range of functional beverages, through the use of advanced concept optimisation research techniques.

The results of this study highlighted the importance of concept optimisation research methodologies to managing knowledge in the early or concept development stage of the NPD process. Gathering customers' views during the early stages of the new product design process through in-depth interviews, focus groups and conjoint analysis identified both potential product design and strategic marketing opportunities for innovative nutrient-enriched, probiotic and stimulant beverage concepts, and provided for a systematic means of managing customer knowledge in new food product development. In-depth interviews and focus groups generated valuable information that could offer guidance to marketers and technical R&D personnel in terms of the evaluation, development and refinement of new functional beverage concepts. The conjoint analysis technique provided for an insightful understanding of customers' choice motives and value systems, which could assist firms in the process of market segmentation and new product design of innovative functional beverages, in a market-oriented fashion. It was evident from both the qualitative and quantitative elements of the research that market opportunities existed for functional beverages in Ireland. However, a key conclusion arising from this research is the niche market nature of the functional food and beverages market. Firms that adopt a market-oriented approach to NPD through the use of advanced concept optimisation research techniques will benefit from a deeper understanding of customers' value systems. This in turn can assist firms identify key market segments and more accurately make

strategic marketing decisions for functional foods and beverages than firms solely pursuing a technology-oriented NPD strategy. Concept optimisation research techniques promote a multi-disciplinary approach to NPD, which can assist firms manage knowledge more efficiently and efficiently between functional disciplines involved in the NPD process.

12.4 Recommendations to Stakeholders in the Functional Food and Beverages Market

The results of this study have important implications for firms pursuing market opportunities in the functional food and beverages market. A key recommendation arising from this study is the need for firms to adopt the key factors for new product success, and to increase the levels of market orientation in firms. Although NPD activities are viewed as incurring high levels of risk in terms of new product failures and associated costs, a market-oriented approach to NPD can assist firms manage knowledge more effectively, leading to the development of innovative functional foods and beverages that closely meet customers' needs. Firms must pay particular attention to the early stages of the NPD process. Integrating customers' views during the early stages of the NPD process can identify undesirable new product concepts, problems associated with new product concepts, or help the formulation of new functional foods and beverages that offer market opportunities based upon genuine customer needs. This market-oriented approach to NPD can also assist firms develop effective segmentation, positioning and communication strategies for new functional foods and beverages. This study concludes that functionality alone cannot be relied upon to leverage competitive advantage in the functional food and beverages market. Consequently, firms should approach the development of functional foods and beverages in a holistic fashion, which takes into account the multi-attributes that drive customers' choice motives. In this context, it is strongly recommended that firms adopt a multi-disciplinary approach to new food product development to enhance knowledge management, both marketing and non-marketing knowledge, throughout the NPD process. Advanced concept optimisation research methodologies, which promote a multi-functional approach to NPD can assist firms manage the innovation function more effectively than hitherto.

It is argued in this study that firms need to pay particular attention to their respective positioning strategies when seeking opportunities in the functional food and beverages market. More so, it is argued that the positioning strategy adopted for a functional food brand must also be congruent with the firm's corporate image in order to gain greater customer acceptance. For example, Newsholme (2002) and Bogue and Sorenson (2001) found that customers held negative perceptions of firms that on one hand produced functional foods and on the other produced less healthy foods such as confectionery or baked goods. In that context, Datamonitor (2005) and Mellentin (2004) reported that multi-national firms such as Kelloggs and Groupe Danone had successfully repositioned their corporate image as part of their long-term strategy for growth in the functional food and beverages market. Therefore, a strong recommendation emerging from this research is the need for Irish firms to strategically reposition their company image from solely food producers to health food manufacturers in order to gain greater customer acceptance, and compete with the large multi-national firms for market share in the functional food and beverages market. One strategic approach to achieving this could involve a dual branding strategy with a number of multi-national pharmaceutical firms to realise synergies in each other's competencies. Indeed, Casey (2004) reported a growing trend towards strategic alliances between food and pharmaceutical firms in order to maximise opportunities in the global functional food and beverages market.

Wennström and Mellentin (2003) and Heasman and Mellentin (2001) argued that customer education in the health benefits associated with functional ingredients was essential to generate mainstream appeal among customers for functional foods and beverages. However, in the absence of either mandatory labelling of functional foods and beverages, or permissive health claims, both policymakers and health promoters have an extremely significant role to play in educating customers in the health promoting properties of foods and beverages. Policymakers in Europe should now consider introducing labelling guidelines similar to those governing health claims in the US or Japan. Such guidelines would provide uniformity in the content and context of functional food and beverage labels. This would ensure accuracy in health-related claims associated with functional foods and beverages, which would also be supported by scientific evidence. Indirectly, this could also have the effect of improving the validity, credibility and trust in functional foods and beverages among customers in

Europe. However, in order for health-related claims to be effective, customers must possess the requisite nutrition knowledge to understand, interpret, and make informed purchase decisions. In this context, it is crucial that health promoters formulate communication strategies, at both a European and national level, that seek to educate customers on the health promoting properties of foods and beverages. This in turn can directly lead to customers gaining sufficient knowledge to make more informed and discerning food choices, and indirectly stimulate customer demand for functional foods and beverages in Europe.

Finally, there is a need for further integration between the various stakeholders in the functional food and beverages market, in order to maximise the benefits afforded by functional products from both a commercial and societal perspective. For example, Wojcik (2005) reported on the synergistic relationship between VGZ, the largest health insurer in the Netherlands, and the Anglo-Dutch Corporation Unilever. Specifically, VGZ introduced a reimbursement scheme valued at €40 per annum to its 120,000 policyholders taking cholesterol-lowering drugs to encourage the purchase of cholesterol-lowering food products. This helped reduce VGZ's annual drug and hospitalisation costs estimated at €35m per annum and stimulated further growth within the cholesterol-lowering food and beverages market in the Netherlands.

12.5 Suggestions for Further Research

Concept Ideation and Development for Functional Beverages

This research illustrated the significance of integrating the customer at the early stages of the NPD process in terms of screening and identifying suitable new product concepts for further evaluation in a market-oriented fashion. In particular, the qualitative research revealed that the carrier or base product selected for enrichment pre-determined the acceptability of a number of functional ingredients. It would therefore prove worthwhile to conduct pre-segmentation research, both qualitative and quantitative, at the concept ideation or generation stage of the NPD process. For example, van Kleef *et al*. (2002) used conjoint analysis to investigate customers' purchase intentions towards a number of hypothetical mini-concept statements. It was therefore possible to model customers' general preferences towards a range of foods and beverages with added functional ingredients. Such research could help identify suitable carriers for enrichment with specific functional beverages. This could have the

effect of detecting problems, from the customer's perspective, associated with particular functional food or beverage concepts much earlier in the NPD process. Although customers may not always be able to articulate their needs and wants, understanding customers' perceptions of new products and food choice motivations at the very early stages of the NPD process can avoid developing new products with a low probability of success.

Market Opportunities for Functional Juices

The results of this study suggest other domains of research relating to the design and marketing of functional foods and beverages that merit further investigation. For example, in this research, purchasers of both chilled and ambient orange juice in Ireland were initially invited to participate in the in-depth interviews and focus group discussions. However, only purchasers of chilled orange juice were subsequently recruited to participate in the conjoint-based quantitative surveys for both chilled nutrient-enriched and probiotic orange juice beverages. This decision was based upon the significance of the chilled category, in terms of both volume and value sales, identified from the literature; and customers' positive perceptions of chilled orange juice, which arose from the in-depth interview and focus group discussions. Nonetheless, the ambient juice sector remains an important product category in Ireland, which could benefit from increased levels of NPD activity. In this context, further quantitative research needs to be conducted with purchasers of ambient orange juice to investigate new product opportunities for nutrient-enriched and probiotic orange juice beverages positioned in the ambient juice section. An investigation of customer trade-offs between functionality and price would form an integral part of this research, owing to the traditional association between purchase intent for ambient juice and price sensitivity (Mintel, 1998).

More so, further research could also incorporate end-users of orange juice (both chilled and ambient) and soft drinks, which would provide a more holistic understanding of customers' preferences for functional juices and stimulant juice-based beverages respectively. This could be achieved through the integration of sensory evaluation and conjoint analysis. It would therefore be possible to model the relationships between a product's sensory attributes, such as desired sweetness and texture, and its marketing-related attributes such as health benefits or health claims

and price. Furthermore, this research placed particular emphasis on the value of gathering 'voice of the customer' information to both manufacturers and retailers pursuing new product opportunities in the Irish functional beverages market. However, the heterogeneous nature of the global functional food and beverages market is a problematic issue for both manufacturers and retailers seeking overseas market opportunities (Wennstrom and Mellentin, 2003). In addition, cross-cultural differences in customers' acceptance and adoption of new functional products presents further difficulties to food and beverage manufacturers seeking opportunities for functional foods and beverages in international markets (Bech-Larsen *et al*., 2001; Heasman and Mellentin, 2001). Thus, further country-specific research, both qualitative and quantitative in nature, would need to be undertaken by food and beverage manufacturers seeking overseas market opportunities for nutrient-enriched, probiotic and stimulant juices.

The issue of identifying a sustainable competitive advantage has become an extremely important influence on NPD activities for both food and beverage firms and retailers in recent years. For example, the qualitative research revealed that customers perceived value, in terms of both superior nutritional and organoleptic quality, from the application of high pressure processing to orange juice. Retailers and manufacturers of fruit juice seeking to leverage competitive advantage in the marketplace could potentially use high pressure processing. However, customer utility or value derived from the application of high pressure processing to chilled functional orange juice was not investigated through the conjoint-based surveys. It would prove beneficial to academics, marketers, and retailers to qualitatively explore the benefits from the application of high pressure processing to foods and beverages, and fruit juice in particular, from the customer's perspective. Similarly, a number of beverage manufacturers, and more recently retailers, have focused on both functionality and the type of juice, and 'not from concentrate' juice in particular, to differentiate their product offering from their competitors. However, functional beverages and 'not from concentrate' juice remain undifferentiated from incumbent products from the customer's perspective. It is clear that both beverage manufacturers and retailers need to re-evaluate their respective communication strategies for both functional and 'not from concentrate' beverages in order to differentiate them further from incumbent beverages. It would therefore prove beneficial to marketers to conduct further

qualitative research that could identify more effective descriptors and promotional strategies. This research could involve the use of the laddering technique, which is based on means-end chain theory. Means-end chain is a cognitive knowledge structure that links a product's attributes with customers' knowledge of consequences and values (Walker and Olson, 1991). It is therefore possible to determine the linkages between product attributes or characteristics and customers' value orientations, which can be used to guide positioning and communication strategies (Nielsen *et al*., 1998; Claeys *et al*., 1995).

12.6 Summary

The increasingly competitive nature of the functional food and beverages market, and the inherent risks associated with the new food product development process, highlight the importance of knowledge management to the NPD process. The NPD literature emphasised the positive influence of market orientation and knowledge management on NPD success, and that advanced concept optimisation research methods could facilitate the integration of the customer during the early stages of the NPD process. This in turn could lead to more effective and efficient knowledge management within firms. This research explored the concept of knowledge management through the use of advanced concept optimisation research techniques, such as in-depth interviews, focus groups and conjoint analysis, during the early stages of the NPD process. The utilisation of customers' views during the early stages of the new product design process identified both potential product design and strategic marketing opportunities associated with innovative nutrient-enriched, probiotic and stimulant beverage concepts, and provided for a systematic means of managing customer knowledge in new food product development.

Once firms have implemented an NPD strategy, and adopted a formal NPD process that is multi-disciplinary in nature, advanced concept optimisation methodologies can then be used to manage knowledge more effectively and efficiently, leading to the development of functional beverages that closely meet customers' needs. This market-oriented approach to NPD illustrated how an understanding of customers' choice motives and value systems could provide guidance to marketers, in terms of segmentation, pricing, communication and positioning strategies, and to R&D personnel, in terms of concept development and product design, when bringing

innovative new products to the market. Market-oriented NPD processes and activities can assist firms manage customer knowledge more effectively and efficiently, and improve the current competitiveness of both beverage manufacturers and retailers in the functional beverages market. Finally, given the significance of NPD to organisational performance and long-term profitability, methodologies that advance both a firm's understanding of customers' choice motives and value systems, and its knowledge management process, can increase the chances of new product success in the functional food and beverages market.

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APPENDIX 1

IN-DEPTH INTERVIEW GUIDE

INTERVIEW GUIDE

CUSTOMERS' ATTITUDES AND PERCEPTIONS TOWARDS ORANGE JUICE AND FUNCTIONAL BEVERAGES

Introduction

Has your consumption of fruit juice (in terms of variety of juices, frequency of consumption etc) changed in recent years?

Background Information on Orange Juice Consumption

Who consumes orange juice in your household?

When, and where, do you consume orange juice?

Why do you choose to consume orange juice? What are the benefits of consuming orange juice?

Product Attributes that Influence Customers Purchase Decision for Orange Juice

The participant is presented with a list of product attributes (on a flipchart) and is asked to identify those attributes they consider most important in terms of choosing among orange juices.

What attributes (or features) of orange juice are important to you when choosing among alternative orange juices? Why are these attributes important to you?

Attitudes & Perceptions towards Specific Orange Juice Attributes

What do you understand by the terms: 'Made with Concentrate'; 'Not From Concentrate'; and 'Freshly Squeezed'?

What are your expectations of an orange juice: 'Made with Concentrate'; 'Not From Concentrate'; and 'Freshly Squeezed'?

Which of these types of orange juice do you choose to purchase, and what are the reasons for your choice?

What is your opinion of an orange juice which is made from a blend of 'made from concentrate' and 'not from concentrate' orange juice? Would you consider purchasing it? Why?

In your opinion, how do juices stored at chilled and ambient temperature differ? Which of these types of orange juice do you choose to purchase? What are the reasons for your choice?

Do you prefer an orange juice containing fruit pieces or a smooth style orange juice without pieces of fruit? What are the reasons for your choice?

Do all orange juices taste the same? How do they differ in terms of taste?

Customer Evaluation of Fruit Juice Packaging and Labelling with Specific Reference to Descriptors & Nutritional Information

The participant is invited to evaluate the packaging design of a number of fruit juices available on the Irish market.

Which packaging design do you most prefer and what are the reasons for your choice? Can this packaging be improved in any way?

Think back to the last time you purchased orange juice, did you pick up the carton/bottle and read the label? What information did you look for?

Do you read the label to check (presented on a flipchart): the Vitamin C content; fat content; cholesterol content; folic acid content; fibre content; calorie content, 'contains no added sugar, preservatives or colour'?

Which of these descriptors would influence you most in choosing among orange juices: 'pure orange juice', 'premium', '100% pure squeezed' '100% natural' and 'organic'?

Customers' General Attitudes towards Functional Juices

The participant is presented with a range of functional juices available on the Irish market.

Have you ever purchased juice containing added vitamins/minerals or fibre in the past? What were the reasons for your choice? If not, why? Investigate customers' attitudes towards functional beverages including price and endorsement by health associations.

Customers' Attitudes towards, and Interest in, New Functional Orange Juices

(1) Probiotic Juice Platform

What is your opinion of probiotic yoghurts and probiotic drinks? Do you purchase probiotic yoghurt or probiotic drinks? Why do you choose to purchase these products? If not, why? In your opinion, what benefits can be gained from consuming probiotic yoghurts/drinks? Where did you come to learn of this? What source(s) of information did you use to learn about probiotics?

The participant is presented (on a flipchart) with a product concept statement for a range of 'probiotic' orange juices outlining the nature of the products, and their potential health benefits.

Would you consider purchasing a probiotic orange juice? What are the reasons for your choice? If not, why?

What particular health benefit(s) (illustrated on the flipchart) are you interested in? Why is this important to you?

Are you aware of any foods/food ingredients or supplements that deliver the same benefit(s)? What are they? Do you think these ingredients should be included in a probiotic juice?

Would you consider an orange juice that offers a number of benefits more appealing? What other benefits would you like to see included?

In your opinion, at what time of the day when would you expect to consume a probiotic orange juice? How frequently would you consume it? In your opinion, is it a product that could be consumed by the entire family? Would you continue to purchase a probiotic yoghurt or drink while purchasing a probiotic orange juice or would you choose between both? Which would you choose and what are the reasons why?

(2) Stimulant Juice Platform

The participant is presented (on a flipchart) with a product concept statement for a range of 'stimulant' orange juices outlining the nature of the products, and their potential benefits.

Would you consider purchasing an orange juice that offers stimulant benefits? What are the reasons for your choice? What particular benefit(s) (illustrated on the flipchart) are you interested in? Why is this important to you?

Would you be in favour of including any of the following ingredients: caffeine (*Red Bull*), taurine (*Red Bull*), glucose, herbal extracts such as Guarana, Ginseng, Kava Kava.

In your opinion, at what time of the day when would you expect to consume a stimulant orange juice? How frequently would you consume it?

In your opinion, is it a product that could be consumed by the entire family?

(3) Nutrient-enriched Juice Platform

The participant is presented (on a flipchart) with a product concept statement outlining the nature of the products, and their potential benefits.

Would you consider purchasing this product? What are the reasons for your choice?

Which formulation would appeal to you most and the reasons why?

Customers' General Attitudes towards High-pressure Processing

Are you aware that the use-by-date for freshly squeezed orange juice is shorter than the use-by-date for juices made from concentrate? Are you aware of the reasons why? How would you feel if you picked up an orange juice pack and read on the label: '*This product has been made using high pressure"*? Would it influence (negative or positive) your decision to purchase the juice? What are your reasons why? Outline the potential benefits of using High Pressure processing i.e. improved flavour, extended use-by-date, improved nutrient content and improved texture.

APPENDIX 2

FOCUS GROUP GUIDE

FOCUS GROUP GUIDE

CUSTOMERS' ATTITUDES TOWARDS EXISTING AND NEW FUNCTIONAL BEVERAGES

Introduction

Has your consumption of fruit juice changed in recent years?

Background Information on Orange Juice Consumption

Who consumes orange juice in your household?

When, and where, do you consume orange juice?

Why do you choose to consume orange juice? What are the benefits of consuming orange juice?

Customers' General Attitudes towards Functional Juices

Participants are presented with a range of functional juices available on the Irish market.

Have you ever purchased juice containing added vitamins/minerals or fibre in the past? What were the reasons for your choice? If not, why? Investigate customers' attitudes towards functional beverages including price and endorsement by health associations.

Customers' Attitudes towards, and Interest in, New Functional Orange Juices

(1) Probiotic Juice Platform

What is your opinion of probiotic yoghurts and probiotic drinks?

Does anyone in the group purchase probiotic yoghurt or probiotic drinks? Why do you choose to purchase these products? If not, why?

In your opinion, what benefits can be gained from consuming probiotic yoghurts/drinks? Where did you come to learn of this? What source(s) of information did you use to learn about probiotics?

Participants are presented (on a flipchart) with a product concept statement for a range of 'probiotic' orange juices outlining the nature of the products, and their potential health benefits.

Would you consider purchasing a probiotic orange juice? What are the reasons for your choice? If not, why? What particular health benefit(s) (illustrated on the flipchart) are you interested in? Why is this important to you?

Are you aware of any foods/food ingredients or supplements that deliver the same benefit(s)? What are they? Do you think these ingredients should be included in a probiotic juice?

Would you consider an orange juice that offers a number of benefits more appealing? What other benefits would you like to see included?

In your opinion, at what time of the day when would you expect to consume a probiotic orange juice? How frequently would you consume it? In your opinion, is it a product that could be consumed by the entire family?

Would you continue to purchase a probiotic yoghurt or drink while purchasing a probiotic orange juice or would you choose between both? Which would you choose and what are the reasons why?

(2) Stimulant Juice Platform

Participants are presented (on a flipchart) with a product concept statement for a range of 'stimulant' orange juices outlining the nature of the products, and their potential benefits.

Would you consider purchasing an orange juice that offers stimulant benefits? What are the reasons for your choice? What particular benefit(s) (illustrated on the flipchart) are you interested in? Why is this important to you? Would you be in favour of including any of the following ingredients: caffeine (*Red Bull*), taurine (*Red Bull*), glucose, herbal extracts such as Guarana, Ginseng, Kava Kava.

In your opinion, at what time of the day when would you expect to consume a stimulant orange juice? How frequently would you consume it? In your opinion, is it a product that could be consumed by the entire family?

(3) Nutrient-enriched Juice Platform

Participants are presented (on a flipchart) with a product concept statement outlining the nature of the products, and their potential benefits.

Would you consider purchasing this product? What are the reasons for your choice?

Which formulation would appeal to you most and the reasons why?

Customers' General Attitudes towards High-pressure Processing

Are you aware that the use-by-date for freshly squeezed orange juice is shorter than the use-by-date for juices made from concentrate? Are you aware of the reasons why?How would you feel if you picked up an orange juice pack and read on the label: '*This product has been made using high pressure"*? Would it influence (negative or positive) your decision to purchase the juice? What are your reasons why? Outline the potential benefits of using High Pressure processing i.e. improved flavour, extended use-by-date, improved nutrient content and improved texture.

APPENDIX 3

PARTICIPANT QUESTIONNAIRE

PARTICIPANT QUESTIONNAIRE

SECTION I: ORANGE JUICE CONSUMPTION

1. **How often do you consume orange juice?** ***Please tick the appropriate box.***

   More than once per day □ Once per week □ Once per fortnight □

   Once per day □ 2-4 times per week □ Once per month □

2. **How often does your household purchase orange juice?** ***Please tick the appropriate box.***

   More than once per week □ Once per week □ Once per fortnight □

3. **Where do you normally purchase orange juice?** ***Please tick the appropriate box(es).***

   Supermarket □ Corner shop □ Petrol station forecourt □ Vending machine □

   Delivered to the door □ Other □ Please specify: _____

4. **Which of these orange juice brands does your household purchase?** ***Please tick the appropriate box(es).***

   Sqeez □ Tropicana □ Dawn □ Private label e.g. Tesco □ CMP □

   Fruice □ Del Monte □ Others □ Please specify: _____

5. **Which of these orange juices (located in different parts of the store i.e. chilled cabinet or on the shelf) does your household purchase?** ***Please tick the appropriate box(es).***

   Not chilled, made from concentrate □ Chilled, made from concentrate □

   Chilled, freshly squeezed □ Chilled, not made from concentrate □

   Don't know □

6. **Which of these carton/bottle sizes does your household purchase?** ***Please tick the appropriate box(es).*** (For comparative purposes: 568ml=1pint; 1000ml=1litre).

   250ml □ 330ml □ 500ml □ 1litre □ Other □ Please specify: _____

7. **What other juices do your household purchase?** ***Please tick the appropriate box(es).***

   Apple □ Grapefruit □ Cranberry □ Pineapple □

   Mixed Fruit Blend □ Other □ Please specify: _____ None □

SECTION II: IMPORTANT ORANGE JUICE ATTRIBUTES

Before completing this section, please read the following instructions carefully. Below is a list of attributes that you might consider important in terms of **choosing** among alternative orange juices.

Choose **7 attributes** (from the list below) that you consider most important when choosing among alternative orange juices. Then, rank your **Top 7** attributes (from 1-7), in decreasing order of importance, according to how important they are in terms of **choosing** among alternative orange juices i.e. **1 being the most important**, **2 being the second most important** etc.

Product Attributes	Rank
Package Size (i.e. 330ml; 500ml; 1 Litre etc)	
Price	
Location In-store (i.e. chilled cabinet or unchilled)	
Health Considerations (e.g. added vitamins etc)	
Package Design (e.g. easy to open; colourful design etc)	
Texture (i.e. with or without pieces of fruit)	
Brand (e.g. Sqeez; Tropicana; Tesco; SuperValu etc)	
Package Material (e.g. glass; plastic; or cardboard etc)	
Taste	
Information from the Package Label	
Use By Date	
Method of Production (i.e. organically produced)	
Manufactured in Ireland	
Type of Juice (i.e. made from concentrate; not made from concentrate; or freshly squeezed)	

If there are other attributes, which you consider important, yet have not been included in the list above, please include them in the space provided below:

SECTION III (PART 1): FUNCTIONAL ORANGE JUICE BEVERAGES

Please rate **Product A**, using a scale from 1–9, by circling the number corresponding to how likely you are to purchase this product. The scale ranges from 1 (most definitely would not purchase) to 9 (most definitely would purchase). **Repeat this step for Product B and Product C**.

Product Description	Most definitely would not purchase								Most definitely would purchase
Product A: ***Probiotic Juice*** is a range of high quality orange juices to which probiotic (also called 'bio' or 'live') bacteria have been added. Other health-promoting ingredients such as selected vitamins, minerals and/or fibre may also be added to complement the benefits from consuming probiotic bacteria. The health benefits which these probiotic bacteria offer range from: alleviation of lactose intolerance; treatment or prevention of diarrhoea, particularly in infants and the elderly; aiding the immune system; helping maintain a healthy digestive system; and protective effects against certain cancers.	1	2	3	4	5	6	7	8	9
Product B: ***Nutrient-enriched Juice*** is a range of high quality orange juices designed to provide some, or all, of the nutritional benefits of milk. This product range does not contain milk. Instead, nutrients such as calcium, vitamins A, B, D, E and K, have been added. Depending on customers' requirements, protein and fat (3.5%, 1.5% or 0%) may also be added. These juices could appeal to: customers who feel their intake of dairy products is inadequate; consumers, both children and adults, who do not like the taste of milk; those who are lactose intolerant; or those who are allergic to milk.	1	2	3	4	5	6	7	8	9
Product C: ***Stimulant Juice*** is a range of high quality orange juices to which selected vitamins, minerals and herbal extracts, such as guarana and ginseng, have been added. These juices are designed to improve overall physical performance and the benefits range from: improved sports performance and recovery; improved mental alertness; or providing an energy and/or stimulation boost.	1	2	3	4	5	6	7	8	9

SECTION III (PART 2): FUNCTIONAL ORANGE JUICE BEVERAGES

Please read the instructions below before completing this section of the questionnaire.

Benefits/Composition	
Probiotic Juice Please rank the following benefits, in decreasing order of interest, according to how much you are interested or disinterested in the benefits outlined i.e. **1 being most interested**, **2 being second most interested** etc.	
Alleviation of lactose intolerance	
Treatment or prevention of diarrhoea	
Aid the immune system	
Help maintain a healthy digestive system	
Protective effect against certain cancers	
Nutrient-enriched Juice Please rank the following groupings of nutritional ingredients, in decreasing order of preference, according to how much you like or dislike the proposed combination of ingredients i.e. **1 being most interested**, **2 being second most interested** etc.	
Contains added calcium & vitamins A, B, D, E & K. Contains 0% fat.	
Contains added calcium & vitamins A, B, D, E & K. Contains 1.5% fat.	
Contains added calcium & vitamins A, B, D, E & K. Contains 3.5% fat.	
Contains added protein, calcium & vitamins A, B, D, E & K. Contains 0% fat.	
Contains added protein, calcium & vitamins A, B, D, E & K. Contains 1.5% fat.	
Contains added protein, calcium & vitamins A, B, D, E & K. Contains 3.5% fat.	
Stimulant Juice Please rank the following benefits, in decreasing order of interest, according to how much you are interested or disinterested in the benefits outlined i.e. **1 being most interested**, **2 being second most interested** etc.	
Improved sports performance, endurance and recovery	
Improved mental alertness	
Provide an energy and/or stimulation boost	

SECTION IV: SOCIO-DEMOGRAPHIC DETAILS

Gender: Male □ Female □

Age Group: ***Please tick the appropriate age group box.***

18-24yrs □	25-29yrs □	30-34yrs □	35-39yrs □
40-44yrs □	45-49yrs □	50-54yrs □	55-59yrs □
60-64yrs □	65-69yrs □	70-74yrs □	75+yrs □

Marital Status: ***Please tick the appropriate marital status box.***

Single □	Married □	Separated / Divorced □
Cohabiting □	Widowed □	

Education Level: ***Please tick the appropriate box corresponding to the highest level of education actually <u>completed</u> to date.***

No Formal Education □	Primary Level □	Intermediate / Junior Cert. □
Leaving Cert. □	Vocational □	Third Level □

Occupational Status: ***Please tick the appropriate box corresponding to your occupational status.***

Employed □	Seeking Work □	At Home □	Retired □
Unemployed □	Disabled □	Student □	

Please state your present, or previous, occupation (where applicable): _____

Occupation of your spouse / partner (where applicable): _____

Net Income (Per Week): ***Tick the appropriate box corresponding to your weekly net income.***

≤€99 □ €100-149 □ €150-199 □ €200-249 □ €250-299 □ €300-349 □

€350-399 □ €400-449 □ €450-499 □ €500-549 □ €550-599 □ ≥€600 □

Number of Child Dependants ***(where applicable):*** _____

APPENDIX 4

EXAMPLE OF QUALITATIVE RESEARCH ANALYSIS USING N6™

Browsing Node 'Tree Nodes/Concept B/Stimjuice/reject/concept/unnatural'

++
+
+++ OF-LINE DOCUMENT: Derek
*12th Exploratory interview on orange juice and functional juices conducted in UCC

++
+++ [Derek : 204 - 204]
If it is a stimulant then it is an artificial way of boosting your system and in the end will work against the normal processes of the body.
++
++++++++++++ 1-4-1- ON-LINE DOCUMENT: FG1Cork
*1st focus group on orange juice and functional juices conducted in UCC on 6th Feb
+ ++
+++ [FG1Cork : 310 - 311]
Kathleen: If your energy is low then there is something that is causing that and anything that claims to give you an energy boost is a false boost.
If your energy is low then you need to take a supplement.

[FG1Cork : 317 - 317]
Louise: I am not interested. Not for those benefits no and certainly not in an orange juice.

[FG1Cork : 337 - 337]
Dermot: Orange juice is something you associate with being natural and if you go adding caffeine and sugar then you are losing the benefits of something that is natural.
++
++++++++++ +++ ON-LINE DOCUMENT: FG2Limerick
*2nd focus group on orange juice and functional juices conducted in Limerick on 27t
+ ++
+++ [FG2Limerick : 292 - 293]
Caroline: Orange juice seems such a natural product. Why add those into it.
++
+++ ON-LINE DOCUMENT: Mary
*8th Exploratory interview on orange juice and functional juices conducted in UCC or
++
++++ [Mary : 256 - 257
I am not interested in this idea at all.
You are abusing orange juice if you are going to put those things into it.
++
+++++++++++++++ +++ ON-LINE DOCUMENT: Noreen
*9th Exploratory interview on orange juice and functional juices conducted in UCC or
++
+++ [Noreen : 286 - 286]
It is a contradiction if you are putting the juice forward as a high quality juice and then you have this rubbish in it.
++
++ ON-LINE DOCUMENT: Simon
*15th Exploratory interview on orange juice and functional juices conducted in UCC

Browsing Node 'Tree Nodes/Concept B/Stimjuice/reject/concept/unnatural'

++
++++ [Simon : 232 - **235 1**
Simon: I wouldn't buy it with caffeine it in.
Not a chance.
It is not orange juice anymore.
I don't know what it is.

APPENDIX 5

CHILLED NUTRIENT-ENRICHED ORANGE JUICE BEVERAGE QUESTIONNAIRE

CONFIDENTIAL

CUSTOMER QUESTIONNAIRE ON CHILLED ORANGE JUICE

ENTERPRISE IRELAND

Market-oriented New Product Development of Functional Beverages

U.C.C.

THE PURPOSE OF THIS RESEARCH

The purpose of this research is to assess the market potential for a range of new chilled orange juices. This research is being undertaken as part of a PhD Thesis. The information you will provide in this questionnaire is completely anonymous and confidential, and will not be divulged to second or third parties. The results of this study will be published in selected academic literature.

INTRODUCTION TO THE QUESTIONNAIRE

This questionnaire should only be completed by a person in your household who **purchases chilled orange juice (i.e. orange juice located in the chilled/refrigerated section of the supermarket/convenience store) at least once per fortnight.**

The questionnaire is divided into four distinct sections. **Please answer all questions/tasks, in each section, where applicable.**

SECTION I: AN EVALUATION OF 20 HYPOTHETICAL ORANGE JUICES

In this section of the questionnaire you are presented with 20 hypothetical orange juices (Products 1 to 20) for evaluation. For the purpose of this study, the 20 hypothetical orange juices (Products 1 to 20) are **only located in the chilled/refrigerated cabinet section** of the supermarket/convenience store (i.e. they are not located alongside juices stored at room temperature on the supermarket shelf).

For Official Use Only			
C	D	L	G

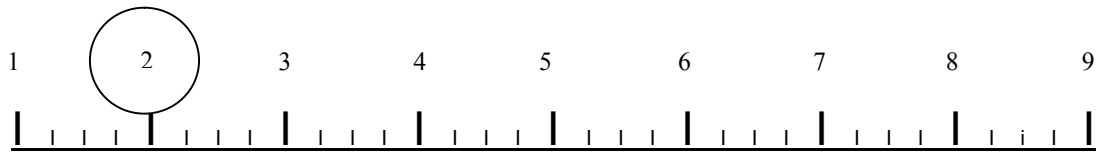
Each hypothetical chilled orange juice is described by 6 attributes. These attributes are: Brand; Type of Juice; Texture; Flavour; Added Ingredients; and Price.

In this survey, **a short description accompanies each attribute** (see example below).

By way of example, the hypothetical chilled orange juice shown below is **described** as an orange juice brand you are familiar with. It is made from freshly squeezed orange juice and has a smooth texture containing no fruity bits. The flavour of this chilled orange juice is described as naturally sweet. A 200ml glass of this orange juice provides the same amount of Calcium as a 200ml glass of milk. This chilled orange juice retails at €2.80 per Litre.

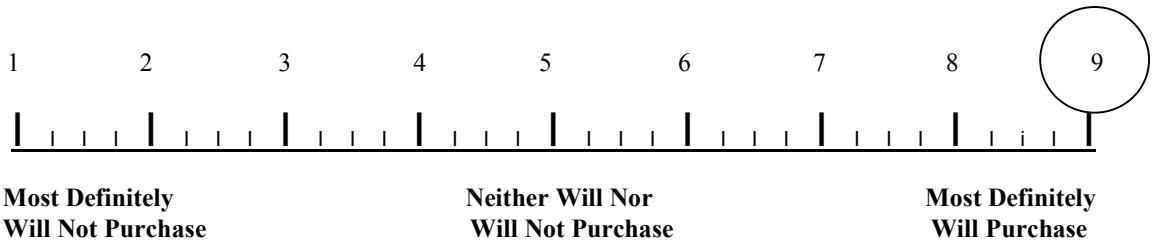
Brand:	An orange juice brand you are familiar with
Type of Juice:	Freshly squeezed orange juice
Texture:	Smooth style - no fruity bits
Flavour:	Naturally sweet (contains no added sugar or sweeteners)
Added Ingredients:	A 200ml glass of this orange juice provides the same amount of Calcium as a 200ml glass of milk
Price:	€2.80 per Litre

Once you have **carefully read** the product description, you must then **rate** (indicate) how likely you are to **purchase** the hypothetical chilled orange juice. This is done by **circling <u>any</u> number <u>between 1 and 9</u> corresponding to how likely you are to purchase the new chilled orange juice**. By way of example, if you **<u>disliked</u>** the chilled orange juice described above you might circle **<u>a low number</u>** (e.g. "**2**" is circled below to indicate a <u>disliking</u> for the chilled orange juice described above).



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

Again, by way of example, if you **liked** the chilled orange juice described previously you might circle **a high number** (e.g. "**9**" is circled below to indicate a liking for the chilled orange juice described previously).



Remember, the higher the value (as you go from 1 to 9), the more appealing the chilled orange juice is to you, and the more likely you are to purchase it.

INSTRUCTIONS

STEP 1: Carefully read the description (i.e. the six attributes) for Product 1.

STEP 2: You must then **rate** Product 1 **by circling any number between 1 and 9**, corresponding to how likely you are to purchase Product 1, where 1 = most definitely will not purchase and 9 = most definitely will purchase.

STEP 3: Repeat steps 1 and 2 for the remaining hypothetical chilled orange juices (Products 2 to 20).

It is important that you judge all 20 hypothetical chilled orange juices before progressing to Section II of this questionnaire. Do not skip any of the 20 hypothetical chilled orange juices.

You may now begin evaluating the 20 hypothetical chilled orange juices

PRODUCT 1

Carefully read the description for **Product 1** below. Then, **rate Product 1** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

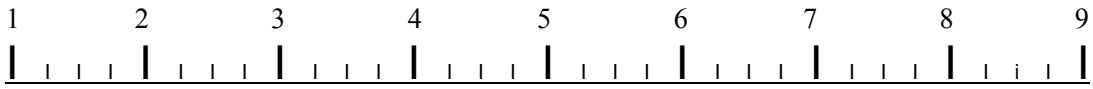
Type of Juice: Made from concentrated orange juice

Texture: Smooth style - no fruity bits

Flavour: Naturally slightly sweet (contains no added sugar or sweeteners)

Added Ingredients: Contains no added protein, vitamins or minerals

Price: €2.80 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 2

Carefully read the description for **Product 2** below. Then, **rate Product 2** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

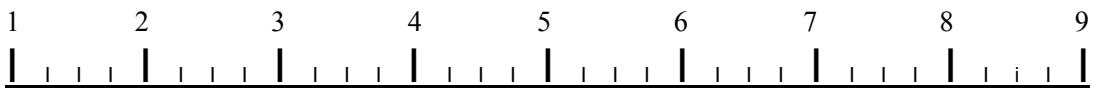
Type of Juice: Made from concentrated orange juice

Texture: Contains fruity bits

Flavour: Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)

Added Ingredients: A 200ml glass of this orange juice provides the same amount of protein, Calcium, vitamins and other minerals as a 200ml glass of milk

Price: €3.70 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 3

Carefully read the description for **Product 3** below. Then, **rate Product 3** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

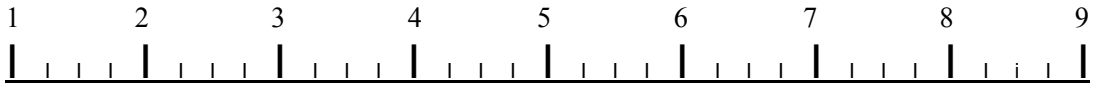
Type of Juice: Freshly squeezed orange juice

Texture: Smooth style - no fruity bits

Flavour: Naturally sweet (contains no added sugar or sweeteners)

Added Ingredients: A 200ml glass of this orange juice provides the same amount of protein, Calcium, vitamins and other minerals as a 200ml glass of milk

Price: €1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 4

Carefully read the description for **Product 4** below. Then, **rate Product 4** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: An orange juice brand you are familiar with

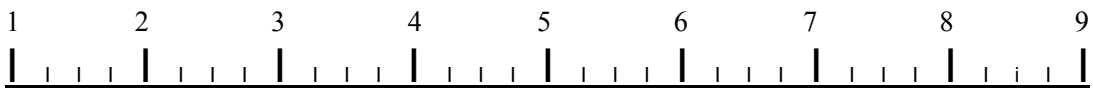
Type of Juice: Not made from concentrated orange juice

Texture: Contains fruity bits

Flavour: Naturally slightly sweet (contains no added sugar or sweeteners)

Added Ingredients: A 200ml glass of this orange juice provides the same amount of protein, Calcium, vitamins and other minerals as a 200ml glass of milk

Price: €1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 5

Carefully read the description for **Product 5** below. Then, **rate Product 5** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

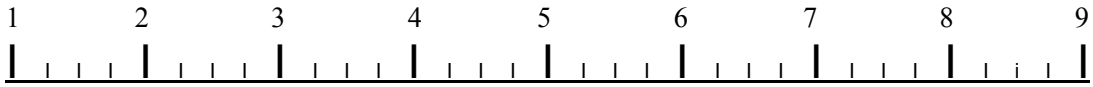
Type of Juice: Freshly squeezed orange juice

Texture: Smooth style - no fruity bits

Flavour: Naturally sweet (contains no added sugar or sweeteners)

Added Ingredients: A 200ml glass of this orange juice provides the same amount of Calcium as a 200ml glass of milk

Price: €2.80 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 6

Carefully read the description for **Product 6** below. Then, **rate Product 6** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

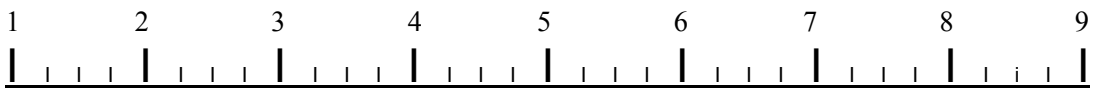
Type of Juice: Not made from concentrated orange juice

Texture: Contains fruity bits

Flavour: Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)

Added Ingredients: A 200ml glass of this orange juice provides the same amount of Calcium as a 200ml glass of milk

Price: €1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 7

Carefully read the description for **Product 7** below. Then, **rate Product 7** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

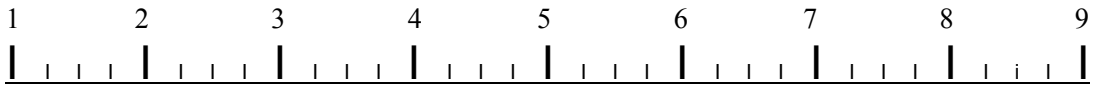
Type of Juice: Freshly squeezed orange juice

Texture: Contains fruity bits

Flavour: Naturally slightly sweet (contains no added sugar or sweeteners)

Added Ingredients: Contains no added protein, vitamins or minerals

Price: €2.80 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 8

Carefully read the description for **Product 8** below. Then, **rate Product 8** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

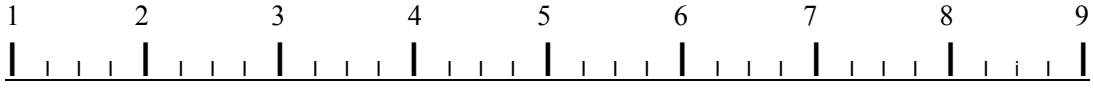
Type of Juice: Made from concentrated orange juice

Texture: Smooth style - no fruity bits

Flavour: Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)

Added Ingredients: Contains no added protein, vitamins or minerals

Price: €1.90 per Litre

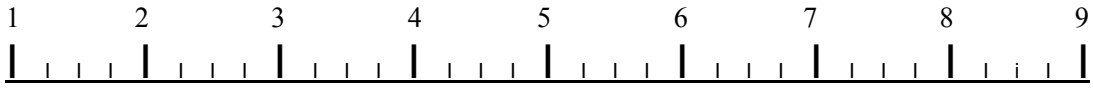


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 9

Carefully read the description for **Product 9** below. Then, **rate Product 9** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	An orange juice brand you are familiar with
Type of Juice:	Made from concentrated orange juice
Texture:	Smooth style - no fruity bits
Flavour:	Naturally slightly sweet (contains no added sugar or sweeteners)
Added Ingredients:	A 200ml glass of this orange juice provides the same amount of Calcium as a 200ml glass of milk
Price:	€1.90 per Litre

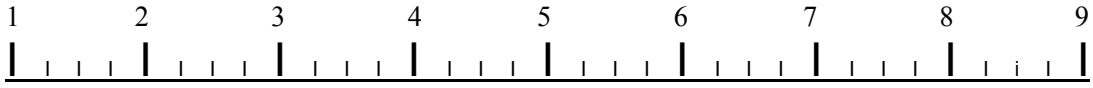


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 10

Carefully read the description for **Product 10** below. Then, **rate Product 10** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new orange juice brand launched on the market
Type of Juice:	Not made from concentrated orange juice
Texture:	Contains fruity bits
Flavour:	Naturally slightly sweet (contains no added sugar or sweeteners)
Added Ingredients:	A 200ml glass of this orange juice provides the same amount of Calcium as a 200ml glass of milk
Price:	€2.80 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 11

Carefully read the description for **Product 11** below. Then, **rate Product 11** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: An orange juice brand you are familiar with

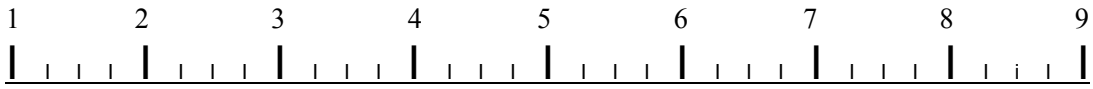
Type of Juice: Freshly squeezed orange juice

Texture: Smooth style - no fruity bits

Flavour: Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)

Added Ingredients: Contains no added protein, vitamins or minerals

Price: €1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 12

Carefully read the description for **Product 12** below. Then, **rate Product 12** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: An orange juice brand you are familiar with

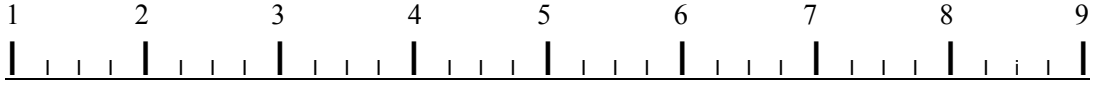
Type of Juice: Made from concentrated orange juice

Texture: Contains fruity bits

Flavour: Naturally sweet (contains no added sugar or sweeteners)

Added Ingredients: Contains no added protein, vitamins or minerals

Price: €2.80 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 13

Carefully read the description for **Product 13** below. Then, **rate Product 13** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: An orange juice brand you are familiar with

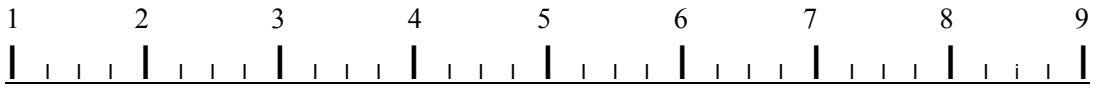
Type of Juice: Freshly squeezed orange juice

Texture: Contains fruity bits

Flavour: Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)

Added Ingredients: Contains no added protein, vitamins or minerals

Price: €1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 14

Carefully read the description for **Product 14** below. Then, **rate Product 14** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

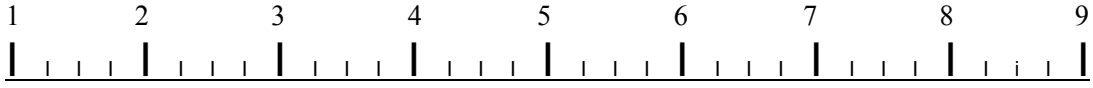
Type of Juice: Freshly squeezed orange juice

Texture: Smooth style - no fruity bits

Flavour: Naturally slightly sweet (contains no added sugar or sweeteners)

Added Ingredients: Contains no added protein, vitamins or minerals

Price: €3.70 per Litre

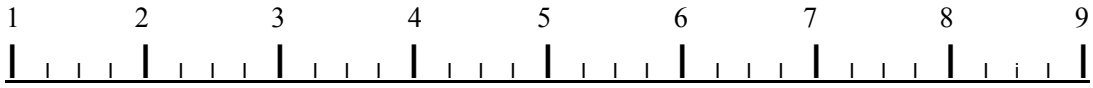


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 15

Carefully read the description for **Product 15** below. Then, **rate Product 15** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new orange juice brand launched on the market
Type of Juice:	Not made from concentrated orange juice
Texture:	Smooth style - no fruity bits
Flavour:	Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)
Added Ingredients:	A 200ml glass of this orange juice provides the same amount of Calcium as a 200ml glass of milk
Price:	€2.80 per Litre

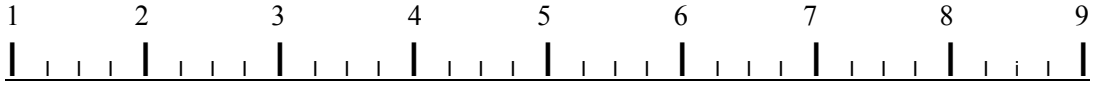


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 16

Carefully read the description for **Product 16** below. Then, **rate Product 16** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new orange juice brand launched on the market
Type of Juice:	Not made from concentrated orange juice
Texture:	Contains fruity bits
Flavour:	Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)
Added Ingredients:	Contains no added protein, vitamins or minerals
Price:	€1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 17

Carefully read the description for **Product 17** below. Then, **rate Product 17** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

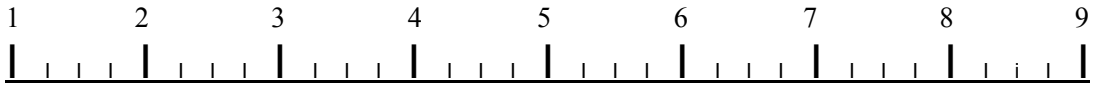
Type of Juice: Freshly squeezed orange juice

Texture: Contains fruity bits

Flavour: Naturally sweet (contains no added sugar or sweeteners)

Added Ingredients: A 200ml glass of this orange juice provides the same amount of Calcium as a 200ml glass of milk

Price: €1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 18

Carefully read the description for **Product 18** below. Then, **rate Product 18** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: An orange juice brand you are familiar with

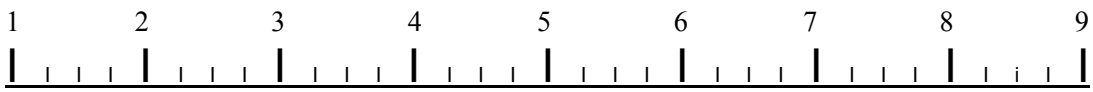
Type of Juice: Freshly squeezed orange juice

Texture: Smooth style - no fruity bits

Flavour: Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)

Added Ingredients: A 200ml glass of this orange juice provides the same amount of protein, Calcium, vitamins and other minerals as a 200ml glass of milk

Price: €2.80 per Litre

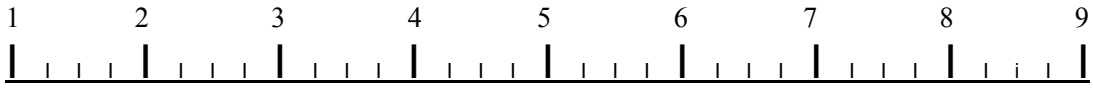


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 19

Carefully read the description for **Product 19** below. Then, **rate Product 19** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	An orange juice brand you are familiar with
Type of Juice:	Freshly squeezed orange juice
Texture:	Contains fruity bits
Flavour:	Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)
Added Ingredients:	A 200ml glass of this orange juice provides the same amount of Calcium as a 200ml glass of milk
Price:	€3.70 per Litre

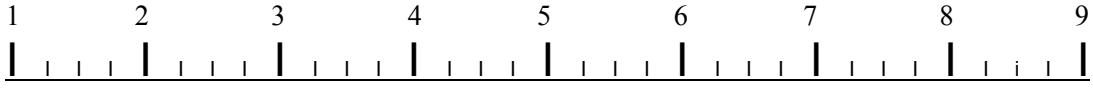


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 20

Carefully read the description for **Product 20** below. Then, **rate Product 20** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	An orange juice brand you are familiar with
Type of Juice:	Not made from concentrated orange juice
Texture:	Smooth style - no fruity bits
Flavour:	Naturally sweet (contains no added sugar or sweeteners)
Added Ingredients:	Contains no added protein, vitamins or minerals
Price:	€3.70 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

SECTION II: PURCHASE BEHAVIOUR & CONSUMPTION OF ORANGE JUICE & OTHER FRUIT JUICES

INTRODUCTION

In this section of the questionnaire you are presented with 10 questions concerning your purchase patterns for, and consumption of, orange juice and other fruit juices.

By way of a reminder, chilled orange juice refers to orange juice located in the chilled/refrigerated cabinet section of the supermarket/convenience store (i.e. they are not located alongside juices stored at room temperature on the supermarket shelf).

Carefully read each question (and accompanying instructions) before attempting to answer each question.

Q1. On average, what quantity of chilled orange juice do you purchase weekly? *Please tick the most appropriate box* (**only one answer may be given**). *If you purchase chilled orange juice fortnightly, please divide the quantity you purchase by two so as an estimate of the amount of chilled orange juice purchased weekly.*

Less than 1 Litre per week	☐ 1
Between 1 and 2 Litres per week	☐ 2
Between 2 and 3 Litres per week	☐ 3
More than 3 Litres per week	☐ 4

Q2. Where do you most frequently purchase chilled orange juice? *Please tick the most appropriate box* (**only one answer may be given**).

Grocery multiples e.g. Tesco, SuperValu etc.	☐ 1
Independent grocers e.g. corner shop	☐ 2
Petrol station forecourt	☐ 3
Vending machine	☐ 4
Other e.g. home delivery	☐ 5

Q3. At present, what package (carton or bottle) size of <u>chilled</u> orange juice do you most frequently purchase? *Please tick the most appropriate box* (**only <u>one</u> answer may be given**). *For comparative purposes: 568ml=1pint; 1000ml=1litre.*

2 Litre	☐ 1	500ml	☐ 5
1.75 Litre	☐ 2	330ml	☐ 6
1 Litre	☐ 3	250ml	☐ 7
1 Pint	☐ 4	Other	☐ 8

Q4. At present, which brand of <u>chilled</u> orange juice do you most frequently purchase? *Please tick the most appropriate box* (**only <u>one</u> answer may be given**).

Sqeez	☐ 1	Private label e.g. Tesco etc.	☐ 5
Dawn	☐ 2	Sunshine Juice	☐ 6
Tropicana	☐ 3	CMP	☐ 7
Fruice	☐ 4	Other	☐ 8

Q5. What type of <u>chilled</u> orange juice do you most frequently purchase? *Please tick the most appropriate box* (**only <u>one</u> answer may be given**).

Made from concentrated orange juice (MFC)	☐ 1
Not made from concentrated orange juice (NFC)	☐ 2
Freshly squeezed orange juice	☐ 3
A blend of MFC and NFC orange juices	☐ 4
Unsure/don't know	☐ 5

Q6. At present, which brand, <u>if any</u>, of fruit juice containing added vitamins or minerals do you most frequently purchase? *Please tick the most appropriate box* (**only <u>one</u> answer may be given**).

Sqeez with Calcium	☐ 1	Weser Gold Multivitamin	☐ 5
Tropicana with Calcium	☐ 2	Kelkin Multivitamin	☐ 6
Tropicana Multivitamins	☐ 3	Other	☐ 7
Weser Gold ACE	☐ 4	None	☐ 8

Q7. On average, how often do you drink chilled orange juice? *Please tick the most appropriate box* (**only one answer may be given**).

More than once per day	☐ 1	Once per week	☐ 5
Once per day	☐ 2	Rarely	☐ 6
4-6 times per week	☐ 3	Never	☐ 7
2-3 times per week	☐ 4		

If you answered 'never' to this question, do not answer the remaining questions in this section. Instead, proceed to Section III of this questionnaire.

Q8. Where do you most frequently drink chilled orange juice? *Please tick the most appropriate box* (**only one answer may be given**).

At home	☐ 1	At work	☐ 4
Restaurant/cafe/public house	☐ 2	Other	☐ 5
On-the-go i.e. in the car, walking etc.	☐ 3		

Q9. Do you drink chilled orange juice with a meal (i.e. breakfast, lunch or dinner)? *Please tick the most appropriate box* (**only one answer may be given**).

Always	☐ 1	Rarely	☐ 3
Sometimes	☐ 2	Never	☐ 4

If you answered 'never' to this question, do not attempt to answer Q10. Instead, proceed to Section III of this questionnaire.

Q10. Which meal is most frequently accompanied by chilled orange juice? *Please tick the most appropriate box* (**only one answer may be given**).

Breakfast	☐ 1
Lunch	☐ 2
Dinner	☐ 3

SECTION III: EATING PATTERNS & CONSUMPTION OF DAIRY OR NON-DAIRY FOODS, BEVERAGES & DIETARY SUPPLEMENTS

INTRODUCTION

In this section of the questionnaire you are presented with 8 questions concerning your eating patterns, and your consumption of a range of products such as dietary supplements, dairy and non-dairy products.

Carefully read each question (and accompanying instructions) before attempting to answer each question.

Q1. Which of the following categories best describes your present dietary lifestyle? *Please tick the most appropriate box* (**only <u>one</u> answer may be given**).

Non-vegetarian (eats food of animal origin such as meat, fish, eggs etc.)	☐ 1
Semi-vegetarian (no red meat; eats fish, poultry, eggs and milk products)	☐ 2
Pesco-vegetarian (no red or white meat; eats fish, eggs and milk products)	☐ 3
Ovo-lacto-vegetarian (no red or white meat; eats eggs and milk products)	☐ 4
Lacto-vegetarian (no red or white meat; eats milk products but not eggs)	☐ 5
Ovo-vegetarian (no red or white meat; eats eggs but not milk products)	☐ 6
Vegan (eats no food of animal origin)	☐ 7
Other	☐ 8

Q2. At present, is there a member(s) of your household whose eating pattern could be described as semi-vegetarian, vegetarian or vegan? *Please tick the most appropriate box* (**only <u>one</u> answer may be given**).

Yes	☐ 1
No	☐ 2
Not applicable	☐ 3

Q3. On average, how often do you eat, drink or use (for cooking) each of the following dairy or non-dairy equivalent products? *Please tick the most appropriate box for each product* (**only one answer may be given per product**).

	More than once per day	Once per day	4-6 times per week	2-3 times per week	Once per week	Rarely	Never
Milk	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Flavoured Milk	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
(Pot) Yoghurt	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Yoghurt Drinks	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Yoghurt Smoothie	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Butter/Spread	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Cheese	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Cream	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Ice-cream	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Q4. On average, how often do you consume milk (dairy or non-dairy) in each of the following situations? *Please tick the most appropriate box for each situation* (**only one answer may be given per situation**).

	More than once per day	Once per day	4-6 times per week	2-3 times per week	Once per week	Rarely	Never
Drink a glass on its own	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
With a hot drink e.g. tea	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
With breakfast cereal	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

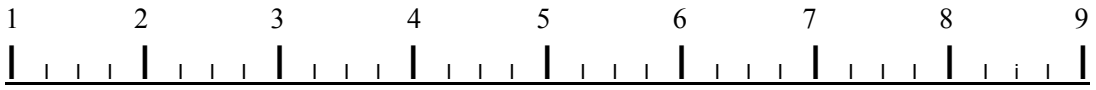
Q5. At present, do you take multi-vitamin/mineral or Calcium supplement capsules/tablets? *Please tick the most appropriate box*.

Yes	☐ 1
No	☐ 2

Q6. At present, does a member(s) of your household take multi-vitamin/mineral or Calcium supplement capsules/tablets? *Please tick the most appropriate box* (**only <u>one</u> answer may be given**).

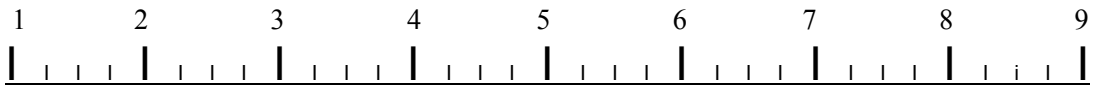
Yes	☐ 1	Unsure	☐ 3
No	☐ 2	Not applicable	☐ 4

Q7. How concerned are you regarding <u>your</u> daily intake of Calcium? *Please circle <u>any</u> number <u>between 1 and 9</u>, corresponding to how concerned you are regarding <u>your</u> daily intake of Calcium.*



Most Definitely Unconcerned — **Neither Concerned Nor Unconcerned** — **Most Definitely Concerned**

Q8. How concerned are you regarding <u>a household member's</u> daily intake of Calcium? *If this question <u>does not apply</u> to you (i.e. you are living with no dependant household members) please circle "5"(neither concerned nor unconcerned). Otherwise, please circle <u>any</u> number <u>between 1 and 9</u>, corresponding to how concerned you are regarding <u>a household member's</u> daily intake of Calcium.*



Most Definitely Unconcerned — **Neither Concerned Nor Unconcerned** — **Most Definitely Concerned**

SECTION IV: SOCIO-DEMOGRAPHIC INFORMATION

INTRODUCTION

In this section of the questionnaire you are presented with 10 questions relating to your socio-demographic background. By way of reminder, the information you will provide in this questionnaire is completely anonymous and confidential, and will not be divulged to second or third parties.

Please answer all 10 questions.

Q1. Gender? *Please tick the box corresponding to your gender.*

Male	☐ 1
Female	☐ 2

Q2. Which age group do you belong to? *Please tick the box corresponding to your age group.*

18-24yrs	☐ 1	50-54yrs	☐ 7
25-29yrs	☐ 2	55-59yrs	☐ 8
30-34yrs	☐ 3	60-64yrs	☐ 9
35-39yrs	☐ 4	65-69yrs	☐ 10
40-44yrs	☐ 5	70-74yrs	☐ 11
45-49yrs	☐ 6	75+yrs	☐ 12

Q3. At present, what level of education have you achieved to date? *Please tick the most appropriate box* (**only one answer may be given**).

No formal education (i.e. did not complete primary school)	☐ 1
Completed primary school (but did not complete Intermediate/Junior Cert.)	☐ 2
Completed Intermediate/Junior Certificate (but did not complete Leaving Cert.)	☐ 3
Completed Leaving Certificate (but did not pursue further education)	☐ 4
Pursuing further education (Certificate; Diploma; Degree(s) etc.)	☐ 5
Completed further education (Certificate; Diploma; Degree(s) etc.)	☐ 6

Q4. What is your marital status? *Please tick the box corresponding to your marital status* (**only <u>one</u> answer may be given**).

Single	☐ 1	Cohabiting	☐ 4
Married	☐ 2	Widowed	☐ 5
Separated/Divorced	☐ 3		

Q5. What is your present occupational status? *Please tick the most appropriate box corresponding to your occupational status* (**only <u>one</u> answer may be given**).

Employed full time	☐ 1	Employment or training scheme	☐ 6
Employed part time	☐ 2	Unpaid work in the home	☐ 7
Self-employed	☐ 3	Retired	☐ 8
Unemployed	☐ 4	Student	☐ 9
Disability allowance	☐ 5	Other	☐ 10

Please state your present, or previous, occupation (where applicable): _____

Please state your partner's present, or previous, occupation (where applicable): _____

IMPORTANT: For the purpose of this study, a household consists of those people that <u>live in the same house</u> **<u>and</u>** <u>compose a family</u> (either married or cohabiting). The household income refers to the income contributed by all adult members of that household. If you are <u>single</u> (i.e. living at home, living alone, or in accommodation with 'non-family' members) then the household income refers to <u>your personal income only</u>.

Q6. Approximately, what is your <u>weekly</u> household <u>net</u> (i.e. after tax) income? *Please tick the box corresponding to your weekly household net income* (**only <u>one</u> answer may be given**).

≤€99	☐ 1	€600-699	☐ 7
€100-199	☐ 2	€700-799	☐ 8
€200-299	☐ 3	€800-899	☐ 9
€300-399	☐ 4	€900-999	☐ 10
€400-499	☐ 5	≥€1000	☐ 11
€500-599	☐ 6	Decline to Answer	☐ 12

Q7. How many incomes are there in your household? *Please tick the most appropriate box* (**only one answer may be given**).

One	☐ 1
Two	☐ 2
More than two	☐ 3

Q8. How many children aged 17 years and under do you have? *Please tick the most appropriate box* (**only one answer may be given**).

None	☐ 1
1 Child	☐ 2
2 Children	☐ 3
More than 2 Children	☐ 4

Q9. How many children aged 18 years and over do you have? *Please tick the most appropriate box* (**only one answer may be given**).

None	☐ 1
1 Child	☐ 2
2 Children	☐ 3
More than 2 Children	☐ 4

Q10. Which part of your county do you live in? *Please tick the most appropriate box* (**only one answer may be given**).

(City) Urban	☐ 1
(City) Suburban	☐ 2
(County) Rural	☐ 3

Thank you for taking the time to complete this questionnaire

APPENDIX 6

CHILLED PROBIOTIC ORANGE JUICE BEVERAGE QUESTIONNAIRE

CONFIDENTIAL

CUSTOMER QUESTIONNAIRE ON CHILLED ORANGE JUICE

ENTERPRISE IRELAND

Market-oriented New Product Development of Functional Beverages

U.C.C.

THE PURPOSE OF THIS RESEARCH

The purpose of this research is to assess the market potential for a range of new chilled orange juices. This research is being undertaken as part of a PhD Thesis. The information you will provide in this questionnaire is completely anonymous and confidential, and will not be divulged to second or third parties. The results of this study will be published in selected academic literature.

INTRODUCTION TO THE QUESTIONNAIRE

This questionnaire should only be completed by a person in your household who **purchases chilled orange juice (i.e. orange juice located in the chilled/refrigerated section of the supermarket/convenience store) at least once per fortnight.**

The questionnaire is divided into four distinct sections. **Please answer all questions/tasks, in each section, where applicable.**

SECTION I: AN EVALUATION OF 20 HYPOTHETICAL ORANGE JUICES

In this section of the questionnaire you are presented with 20 hypothetical orange juices (Products 1 to 20) for evaluation. For the purpose of this study, the 20 hypothetical orange juices (Products 1 to 20) are **only located in the chilled/refrigerated cabinet section** of the supermarket/convenience store (i.e. they are not located alongside juices stored at room temperature on the supermarket shelf).

For Official Use Only			
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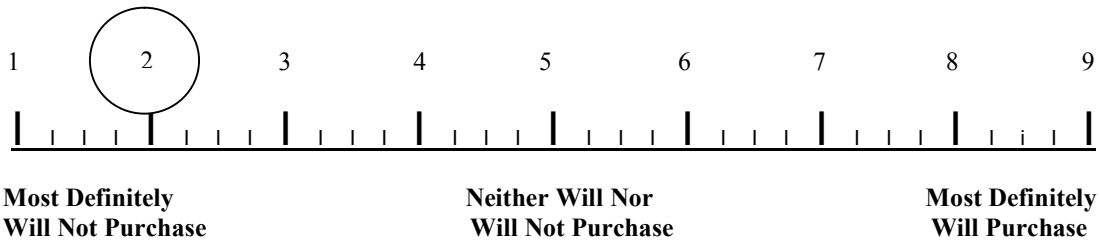
Each hypothetical chilled orange juice is described by 6 attributes. These attributes are: Brand, Type of Juice, Texture, Flavour, Health Benefits, and Price.

In this survey, **a short description accompanies each attribute** (see example below).

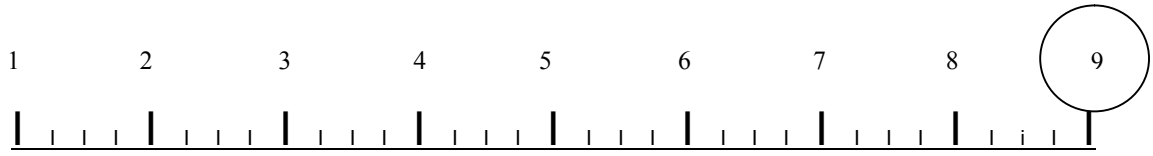
By way of example, the hypothetical chilled orange juice shown below is **described** as an orange juice brand you are familiar with. It is made from freshly squeezed orange juice and has a smooth texture containing no fruity bits. The flavour of this chilled orange juice is described as naturally sweet. It contains probiotic cultures and selected ingredients to aid your immune system and retails at €2.80 per Litre.

Brand:	An orange juice brand you are familiar with
Type of Juice:	Freshly squeezed orange juice
Texture:	Smooth style - no fruity bits
Flavour:	Naturally sweet (contains no added sugar or sweeteners)
Health Benefits:	Contains probiotic cultures (also known as 'bio' or live bacteria) and selected ingredients, such as vitamins and minerals, to aid the immune system
Price:	€2.80 per Litre

Once you have **carefully read** the product description, you must then **rate** (indicate) how likely you are to **purchase** the hypothetical chilled orange juice. This is done by **circling <u>any</u> number <u>between 1 and 9</u> corresponding to how likely you are to purchase the new chilled orange juice**. By way of example, if you **<u>disliked</u>** the chilled orange juice described above you might circle **<u>a low number</u>** (e.g. "**2**" is circled below to indicate a <u>disliking</u> for the chilled orange juice described above).



Again, by way of example, if you **liked** the chilled orange juice described previously you might circle **a high number** (e.g. "**9**" is circled below to indicate a liking for the chilled orange juice described previously).



Most Definitely Will Not Purchase | **Neither Will Nor Will Not Purchase** | **Most Definitely Will Purchase**

Remember, the higher the value (as you go from 1 to 9), the more appealing the chilled orange juice is to you, and the more likely you are to purchase it.

INSTRUCTIONS

STEP 1: Carefully read the description (i.e. the six attributes) for Product 1.

STEP 2: You must then **rate** Product 1 **by circling any number between 1 and 9**, corresponding to how likely you are to purchase Product 1, where 1 = most definitely will not purchase and 9 = most definitely will purchase.

STEP 3: Repeat steps 1 and 2 for the remaining hypothetical chilled orange juices (Products 2 to 20).

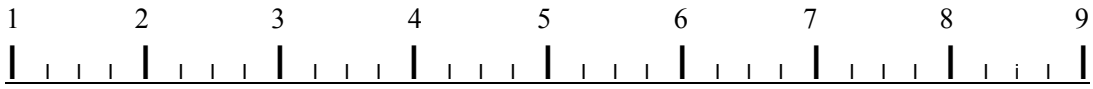
It is important that you judge all 20 hypothetical chilled orange juices before progressing to Section II of this questionnaire. Do not skip any of the 20 hypothetical chilled orange juices.

You may now begin evaluating the 20 hypothetical chilled orange juices

PRODUCT 1

Carefully read the description for **Product 1** below. Then, **rate Product 1** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new orange juice brand launched on the market
Type of Juice:	Made from concentrated orange juice
Texture:	Smooth style - no fruity bits
Flavour:	Naturally slightly sweet (contains no added sugar or sweeteners)
Health Benefits:	Contains no added ingredients and offers no additional health benefits
Price:	€2.80 per Litre

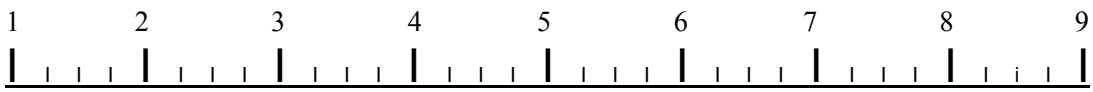


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 2

Carefully read the description for **Product 2** below. Then, **rate Product 2** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new orange juice brand launched on the market
Type of Juice:	Made from concentrated orange juice
Texture:	Contains fruity bits
Flavour:	Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)
Health Benefits:	Contains probiotic cultures (also known as 'bio' or live bacteria) and selected ingredients, such as vitamins and minerals, to aid the digestive system
Price:	€3.70 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 3

Carefully read the description for **Product 3** below. Then, **rate Product 3** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

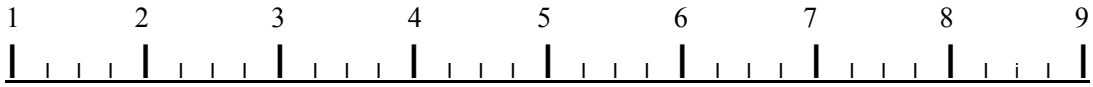
Type of Juice: Freshly squeezed orange juice

Texture: Smooth style - no fruity bits

Flavour: Naturally sweet (contains no added sugar or sweeteners)

Health Benefits: Contains probiotic cultures (also known as 'bio' or live bacteria) and selected ingredients, such as vitamins and minerals, to aid the digestive system

Price: €1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 4

Carefully read the description for **Product 4** below. Then, **rate Product 4** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: An orange juice brand you are familiar with

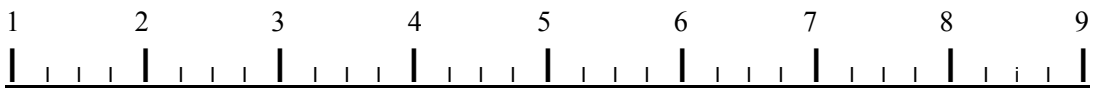
Type of Juice: Not made from concentrated orange juice

Texture: Contains fruity bits

Flavour: Naturally slightly sweet (contains no added sugar or sweeteners)

Health Benefits: Contains probiotic cultures (also known as 'bio' or live bacteria) and selected ingredients, such as vitamins and minerals, to aid the digestive system

Price: €1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 5

Carefully read the description for **Product 5** below. Then, **rate Product 5** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

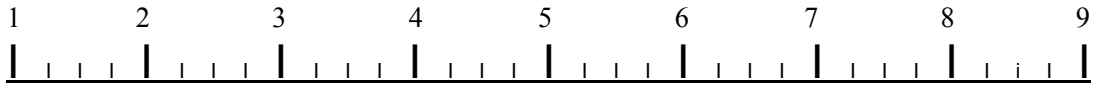
Type of Juice: Freshly squeezed orange juice

Texture: Smooth style - no fruity bits

Flavour: Naturally sweet (contains no added sugar or sweeteners)

Health Benefits: Contains probiotic cultures (also known as 'bio' or live bacteria) and selected ingredients, such as vitamins and minerals, to aid the immune system

Price: €2.80 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 6

Carefully read the description for **Product 6** below. Then, **rate Product 6** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

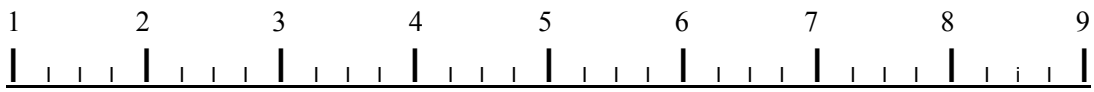
Type of Juice: Not made from concentrated orange juice

Texture: Contains fruity bits

Flavour: Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)

Health Benefits: Contains probiotic cultures (also known as 'bio' or live bacteria) and selected ingredients, such as vitamins and minerals, to aid the immune system

Price: €1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 7

Carefully read the description for **Product 7** below. Then, **rate Product 7** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

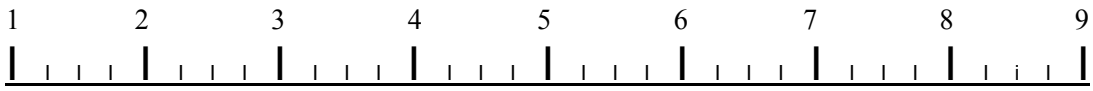
Type of Juice: Freshly squeezed orange juice

Texture: Contains fruity bits

Flavour: Naturally slightly sweet (contains no added sugar or sweeteners)

Health Benefits: Contains no added ingredients and offers no additional health benefits

Price: €2.80 per Litre



Most Definitely Will Not Purchase | **Neither Will Nor Will Not Purchase** | **Most Definitely Will Purchase**

PRODUCT 8

Carefully read the description for **Product 8** below. Then, **rate Product 8** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

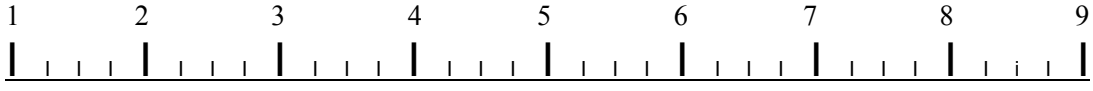
Type of Juice: Made from concentrated orange juice

Texture: Smooth style - no fruity bits

Flavour: Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)

Health Benefits: Contains no added ingredients and offers no additional health benefits

Price: €1.90 per Litre



Most Definitely Will Not Purchase | **Neither Will Nor Will Not Purchase** | **Most Definitely Will Purchase**

PRODUCT 9

Carefully read the description for **Product 9** below. Then, **rate Product 9** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: An orange juice brand you are familiar with

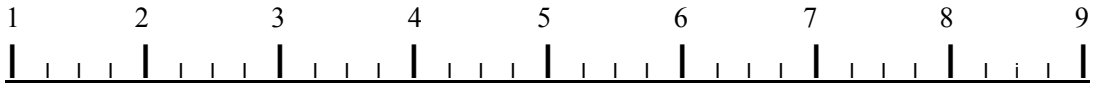
Type of Juice: Made from concentrated orange juice

Texture: Smooth style - no fruity bits

Flavour: Naturally slightly sweet (contains no added sugar or sweeteners)

Health Benefits: Contains probiotic cultures (also known as 'bio' or live bacteria) and selected ingredients, such as vitamins and minerals, to aid the immune system

Price: €1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 10

Carefully read the description for **Product 10** below. Then, **rate Product 10** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

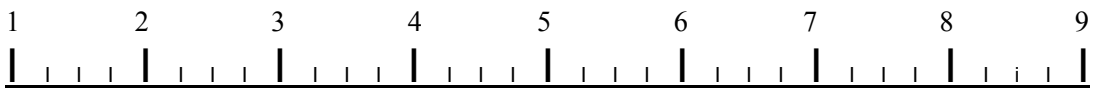
Type of Juice: Not made from concentrated orange juice

Texture: Contains fruity bits

Flavour: Naturally slightly sweet (contains no added sugar or sweeteners)

Health Benefits: Contains probiotic cultures (also known as 'bio' or live bacteria) and selected ingredients, such as vitamins and minerals, to aid the immune system

Price: €2.80 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 11

Carefully read the description for **Product 11** below. Then, **rate Product 11** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: An orange juice brand you are familiar with

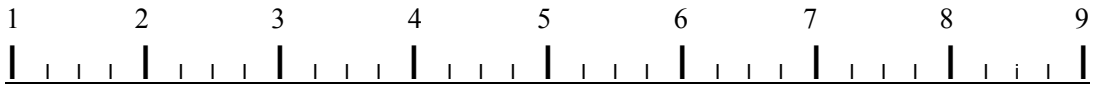
Type of Juice: Freshly squeezed orange juice

Texture: Smooth style - no fruity bits

Flavour: Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)

Health Benefits: Contains no added ingredients and offers no additional health benefits

Price: €1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 12

Carefully read the description for **Product 12** below. Then, **rate Product 12** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: An orange juice brand you are familiar with

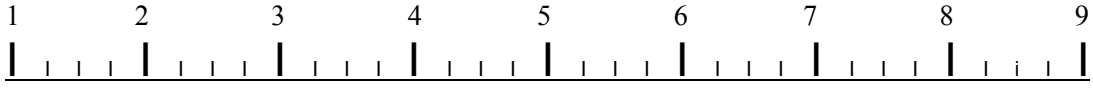
Type of Juice: Made from concentrated orange juice

Texture: Contains fruity bits

Flavour: Naturally sweet (contains no added sugar or sweeteners)

Health Benefits: Contains no added ingredients and offers no additional health benefits

Price: €2.80 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 13

Carefully read the description for **Product 13** below. Then, **rate Product 13** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: An orange juice brand you are familiar with

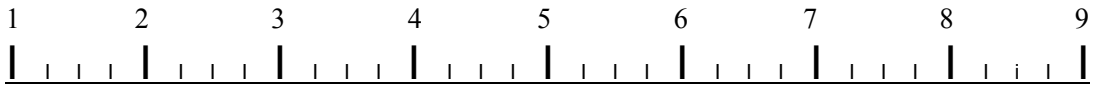
Type of Juice: Freshly squeezed orange juice

Texture: Contains fruity bits

Flavour: Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)

Health Benefits: Contains no added ingredients and offers no additional health benefits

Price: €1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 14

Carefully read the description for **Product 14** below. Then, **rate Product 14** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

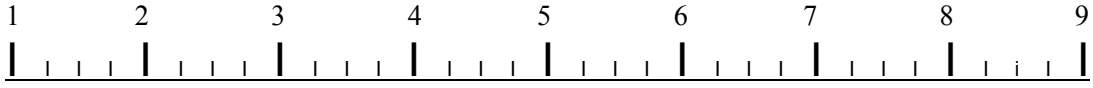
Type of Juice: Freshly squeezed orange juice

Texture: Smooth style - no fruity bits

Flavour: Naturally slightly sweet (contains no added sugar or sweeteners)

Health Benefits: Contains no added ingredients and offers no additional health benefits

Price: €3.70 per Litre

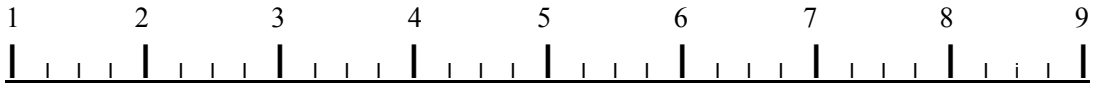


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 15

Carefully read the description for **Product 15** below. Then, **rate Product 15** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new orange juice brand launched on the market
Type of Juice:	Not made from concentrated orange juice
Texture:	Smooth style - no fruity bits
Flavour:	Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)
Health Benefits:	Contains probiotic cultures (also known as 'bio' or live bacteria) and selected ingredients, such as vitamins and minerals, to aid the immune system
Price:	€2.80 per Litre

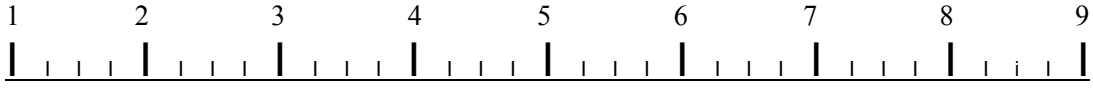


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 16

Carefully read the description for **Product 16** below. Then, **rate Product 16** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new orange juice brand launched on the market
Type of Juice:	Not made from concentrated orange juice
Texture:	Contains fruity bits
Flavour:	Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)
Health Benefits:	Contains no added ingredients and offers no additional health benefits
Price:	€1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 17

Carefully read the description for **Product 17** below. Then, **rate Product 17** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: A new orange juice brand launched on the market

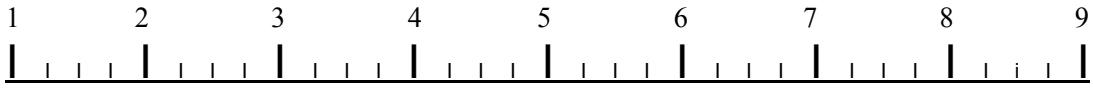
Type of Juice: Freshly squeezed orange juice

Texture: Contains fruity bits

Flavour: Naturally sweet (contains no added sugar or sweeteners)

Health Benefits: Contains probiotic cultures (also known as 'bio' or live bacteria) and selected ingredients, such as vitamins and minerals, to aid the immune system

Price: €1.90 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 18

Carefully read the description for **Product 18** below. Then, **rate Product 18** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: An orange juice brand you are familiar with

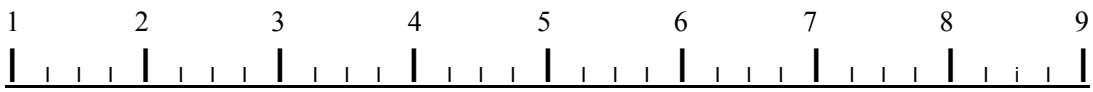
Type of Juice: Freshly squeezed orange juice

Texture: Smooth style - no fruity bits

Flavour: Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)

Health Benefits: Contains probiotic cultures (also known as 'bio' or live bacteria) and selected ingredients, such as vitamins and minerals, to aid the digestive system

Price: €2.80 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 19

Carefully read the description for **Product 19** below. Then, **rate Product 19** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: An orange juice brand you are familiar with

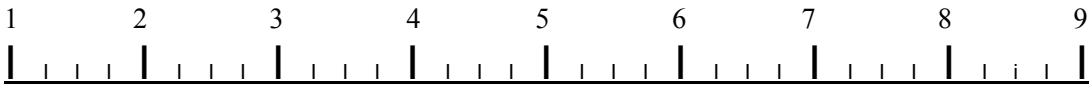
Type of Juice: Freshly squeezed orange juice

Texture: Contains fruity bits

Flavour: Tangy, sharp, slightly bitter (contains no added sugar or sweeteners)

Health Benefits: Contains probiotic cultures (also known as 'bio' or live bacteria) and selected ingredients, such as vitamins and minerals, to aid the immune system

Price: €3.70 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 20

Carefully read the description for **Product 20** below. Then, **rate Product 20** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand: An orange juice brand you are familiar with

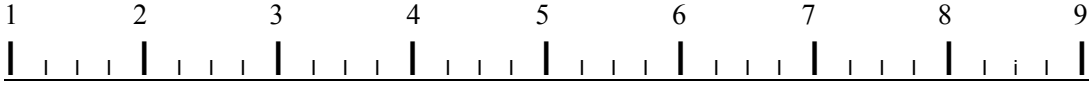
Type of Juice: Not made from concentrated orange juice

Texture: Smooth style - no fruity bits

Flavour: Naturally sweet (contains no added sugar or sweeteners)

Health Benefits: Contains no added ingredients and offers no additional health benefits

Price: €3.70 per Litre



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

SECTION II: PURCHASE BEHAVIOUR & CONSUMPTION OF ORANGE JUICE & OTHER FRUIT JUICES

INTRODUCTION

In this section of the questionnaire you are presented with 10 questions concerning your purchase patterns for, and consumption of, orange juice and other fruit juices.

By way of a reminder, chilled orange juice refers to orange juice located in the chilled/refrigerated cabinet section of the supermarket/convenience store (i.e. they are not located alongside juices stored at room temperature on the supermarket shelf).

Carefully read each question (and accompanying instructions) before attempting to answer each question.

Q1. On average, what quantity of chilled orange juice do you purchase weekly? *Please tick the most appropriate box* (**only one answer may be given**). *If you purchase chilled orange juice fortnightly, please divide the quantity you purchase by two so as an estimate of the amount of chilled orange juice purchased weekly.*

Less than 1 Litre per week	☐ 1
Between 1 and 2 Litres per week	☐ 2
Between 2 and 3 Litres per week	☐ 3
More than 3 Litres per week	☐ 4

Q2. Where do you most frequently purchase chilled orange juice? *Please tick the most appropriate box* (**only one answer may be given**).

Grocery multiples e.g. Tesco, SuperValu etc.	☐ 1
Independent grocers e.g. corner shop	☐ 2
Petrol station forecourt	☐ 3
Vending machine	☐ 4
Other e.g. home delivery	☐ 5

Q3. At present, what package (carton or bottle) size of chilled orange juice do you most frequently purchase? *Please tick the most appropriate box* (**only one answer may be given**). *For comparative purposes: 568ml=1pint; 1000ml=1litre.*

2 Litre	☐ 1	500ml	☐ 5
1.75 Litre	☐ 2	330ml	☐ 6
1 Litre	☐ 3	250ml	☐ 7
1 Pint	☐ 4	Other	☐ 8

Q4. At present, which brand of chilled orange juice do you most frequently purchase? *Please tick the most appropriate box* (**only one answer may be given**).

Sqeez	☐ 1	Private label e.g. Tesco etc.	☐ 5
Dawn	☐ 2	Sunshine Juice	☐ 6
Tropicana	☐ 3	CMP	☐ 7
Fruice	☐ 4	Other	☐ 8

Q5. What type of chilled orange juice do you most frequently purchase? *Please tick the most appropriate box* (**only one answer may be given**).

Made from concentrated orange juice (MFC)	☐ 1
Not made from concentrated orange juice (NFC)	☐ 2
Freshly squeezed orange juice	☐ 3
A blend of MFC and NFC orange juices	☐ 4
Unsure/don't know	☐ 5

Q6. At present, which brand, if any, of fruit juice containing added vitamins or minerals do you most frequently purchase? *Please tick the most appropriate box* (**only one answer may be given**).

Sqeez with Calcium	☐ 1	Weser Gold Multivitamin	☐ 5
Tropicana with Calcium	☐ 2	Kelkin Multivitamin	☐ 6
Tropicana Multivitamins	☐ 3	Other	☐ 7
Weser Gold ACE	☐ 4	None	☐ 8

Q7. On average, how often do you drink chilled orange juice? *Please tick the most appropriate box* (**only one answer may be given**).

More than once per day	☐ 1	Once per week	☐ 5
Once per day	☐ 2	Rarely	☐ 6
4-6 times per week	☐ 3	Never	☐ 7
2-3 times per week	☐ 4		

If you answered 'never' to this question, do not answer the remaining questions in this section. Instead, proceed to Section III of this questionnaire.

Q8. Where do you most frequently drink chilled orange juice? *Please tick the most appropriate box* (**only one answer may be given**).

At home	☐ 1	At work	☐ 4
Restaurant/cafe/public house	☐ 2	Other	☐ 5
On-the-go i.e. in the car, walking etc.	☐ 3		

Q9. Do you drink chilled orange juice with a meal (i.e. breakfast, lunch or dinner)? *Please tick the most appropriate box* (**only one answer may be given**).

Always	☐ 1	Rarely	☐ 3
Sometimes	☐ 2	Never	☐ 4

If you answered 'never' to this question, do not attempt to answer Q10. Instead, proceed to Section III of this questionnaire.

Q10. Which meal is most frequently accompanied by chilled orange juice? *Please tick the most appropriate box* (**only one answer may be given**).

Breakfast	☐ 1
Lunch	☐ 2
Dinner	☐ 3

SECTION III: PURCHASE BEHAVIOUR FOR PROBIOTIC FOODS, BEVERAGES & SUPPLEMENTS

INTRODUCTION

Food companies are increasingly adding 'friendly' bacteria to everyday foods such as milk, yoghurt, yoghurt drinks, smoothies and dietary supplements. These 'friendly' bacteria are often referred to as '**probiotic**' bacteria/cultures. They are also called '**bio**' or '**live**' bacteria/cultures.

In this section of the questionnaire you are presented with 5 questions concerning your purchase patterns for a range of probiotic products such as probiotic milks, probiotic yoghurts and yoghurt drinks, probiotic smoothies, and dietary supplements containing probiotic cultures.

Carefully read each question (and accompanying instructions) before attempting to answer each question.

Q1. At present, which brand, <u>if any</u>, of <u>probiotic milk</u> (i.e. milk containing probiotic bacteria) do you most frequently purchase? *Please tick the most appropriate box* (**only <u>one</u> answer may be given**).

CMP Bio Milk	☐ 1
Avonmore Bio Milk	☐ 2
Other	☐ 3
None	☐ 4

Q2. At present, which brand, <u>if any</u>, of <u>probiotic yoghurt drink</u> (i.e. a yoghurt drink containing probiotic bacteria) do you most frequently purchase? *Please tick the most appropriate box* (**only <u>one</u> answer may be given**).

Danone Actimel	☐ 1	Yakult	☐ 6
Danone Shape Bio Yoghurt Drink	☐ 2	Yoplait Everybody	☐ 7
Danone Gervais	☐ 3	Other	☐ 8
Glenisk Probiotic Live Yoghurt Drink	☐ 4	None	☐ 9
Muller Vitality	☐ 5		

Q3. At present, which brand, <u>if any</u>, of <u>probiotic (pot) yoghurt</u> (i.e. a (pot) yoghurt containing probiotic bacteria) do you most frequently purchase? *Please tick the most appropriate box* (**only <u>one</u> answer may be given**).

Benecol Low Fat Bio Yoghurt	☐ 1	Onken Bio Pot	☐ 9
Dale Farm Spelga Light Yoghurt	☐ 2	SNO Fit 4 Life	☐ 10
Danone Actimel Yoghurt	☐ 3	Yoplait 0% Yoghurt	☐ 11
Danone Bio Activia	☐ 4	Yoplait Bioplus	☐ 12
Irish Yoghurts Bioactive	☐ 5	Danone Shape	☐ 13
Glenisk Organic Probiotic Yoghurt	☐ 6	Muller Vitality	☐ 14
Private Label Bio Yoghurt e.g. Tesco	☐ 7	Other	☐ 15
Yeo Valley Bio Live Yoghurt	☐ 8	None	☐ 16

Q4. Smoothies are fruit drinks made from a blend of crushed and freshly squeezed fruit. Some smoothies also have bio (probiotic) yoghurt added to them. **At present, which brand, <u>if any</u>, of <u>probiotic smoothie</u> (i.e. a smoothie containing probiotic bacteria) do you most frequently purchase?** *Please tick the most appropriate box* (**only <u>one</u> answer may be given**).

Innocent Fresh Yoghurt Thickie	☐ 1
PJ Mooothie	☐ 2
Wild Orchard Bio Smoothie	☐ 3
Other	☐ 4
None	☐ 5

Q5. At present, do you purchase supplement capsules/tablets containing probiotic (also known as 'live' or 'bio') bacteria e.g. Seven Seas Multibionta, Natures Way Primadophilus Bifidus? *Please tick the most appropriate box*.

Yes	☐ 1
No	☐ 2

SECTION IV: SOCIO-DEMOGRAPHIC INFORMATION

INTRODUCTION

In this section of the questionnaire you are presented with 10 questions relating to your socio-demographic background. By way of reminder, the information you will provide in this questionnaire is completely anonymous and confidential, and will not be divulged to second or third parties.

Please answer all 10 questions.

Q1. Gender? *Please tick the box corresponding to your gender.*

Male	☐ 1
Female	☐ 2

Q2. Which age group do you belong to? *Please tick the box corresponding to your age group.*

18-24yrs	☐ 1	50-54yrs	☐ 7
25-29yrs	☐ 2	55-59yrs	☐ 8
30-34yrs	☐ 3	60-64yrs	☐ 9
35-39yrs	☐ 4	65-69yrs	☐ 10
40-44yrs	☐ 5	70-74yrs	☐ 11
45-49yrs	☐ 6	75+yrs	☐ 12

Q3. At present, what level of education have you achieved to date? *Please tick the most appropriate box* (**only one answer may be given**).

No formal education (i.e. did not complete primary school)	☐ 1
Completed primary school (but did not complete Intermediate/Junior Cert.)	☐ 2
Completed Intermediate/Junior Certificate (but did not complete Leaving Cert.)	☐ 3
Completed Leaving Certificate (but did not pursue further education)	☐ 4
Pursuing further education (Certificate; Diploma; Degree(s) etc.)	☐ 5
Completed further education (Certificate; Diploma; Degree(s) etc.)	☐ 6

Q4. What is your marital status? *Please tick the box corresponding to your marital status* (**only <u>one</u> answer may be given**).

Single	☐ 1	Cohabiting	☐ 4
Married	☐ 2	Widowed	☐ 5
Separated/Divorced	☐ 3		

Q5. What is your present occupational status? *Please tick the most appropriate box corresponding to your occupational status* (**only <u>one</u> answer may be given**).

Employed full time	☐ 1	Employment or training scheme	☐ 6
Employed part time	☐ 2	Unpaid work in the home	☐ 7
Self-employed	☐ 3	Retired	☐ 8
Unemployed	☐ 4	Student	☐ 9
Disability allowance	☐ 5	Other	☐ 10

Please state your present, or previous, occupation (where applicable): _____

Please state your partner's present, or previous, occupation (where applicable): _____

IMPORTANT: For the purpose of this study, a household consists of those people that <u>live in the same house</u> **<u>and</u>** <u>compose a family</u> (either married or cohabiting). The household income refers to the income contributed by all adult members of that household. If you are <u>single</u> (i.e. living at home, living alone, or in accommodation with 'non-family' members) then the household income refers to <u>your personal income only</u>.

Q6. Approximately, what is your <u>weekly</u> household <u>net</u> (i.e. after tax) income? *Please tick the box corresponding to your weekly household net income* (**only <u>one</u> answer may be given**).

≤€99	☐ 1	€600-699	☐ 7
€100-199	☐ 2	€700-799	☐ 8
€200-299	☐ 3	€800-899	☐ 9
€300-399	☐ 4	€900-999	☐ 10
€400-499	☐ 5	≥€1000	☐ 11
€500-599	☐ 6	Decline to Answer	☐ 12

Q7. How many incomes are there in your household? *Please tick the most appropriate box* (**only one answer may be given**).

One	☐ 1
Two	☐ 2
More than two	☐ 3

Q8. How many children aged 17 years and under do you have? *Please tick the most appropriate box* (**only one answer may be given**).

None	☐ 1
1 Child	☐ 2
2 Children	☐ 3
More than 2 Children	☐ 4

Q9. How many children aged 18 years and over do you have? *Please tick the most appropriate box* (**only one answer may be given**).

None	☐ 1
1 Child	☐ 2
2 Children	☐ 3
More than 2 Children	☐ 4

Q10. Which part of your county do you live in? *Please tick the most appropriate box* (**only one answer may be given**).

(City) Urban	☐ 1
(City) Suburban	☐ 2
(County) Rural	☐ 3

Thank you for taking the time to complete this questionnaire

APPENDIX 7

STIMULANT BEVERAGE QUESTIONNAIRE

CONFIDENTIAL

CUSTOMER QUESTIONNAIRE ON SOFT DRINKS

ENTERPRISE IRELAND

Market-oriented New Product Development of Functional Beverages

U.C.C.

THE PURPOSE OF THIS RESEARCH

The purpose of this research is to assess the market potential for new soft drinks in Ireland. This research is being undertaken as part of a PhD Thesis. The information you will provide in this questionnaire is **completely anonymous** and **confidential**, and will not be divulged to second or third parties. The results of this study will be published in selected academic literature.

INTRODUCTION TO THE QUESTIONNAIRE

This questionnaire should only be completed by a person **aged between 18 and 39 years** who **purchases soft drinks**. For the purpose of this study, soft drinks (both diet and non-diet) **include**:

Cola (e.g. Coca-Cola etc.), ***orange*** (e.g. Club Orange, Fanta, Finches etc.), ***lemonade/lemon & lime*** (e.g. 7UP, Sprite etc.), and other flavoured carbonated soft drinks such as Lilt, Cidona etc.

Juice drinks such as Oasis, Sunny Delight, and Ocean Spray Cranberry and Blackcurrant, as well as ready-to-drink versions of concentrates such as Ribena Ready to Drink etc.

Sports drinks such as Lucozade Sport, Gatorade, Powerade, and Club Energise etc. ***Energy drinks*** such as Lucozade Original, Lucozade Energy, and Finches Fuel. ***Stimulant drinks*** such as Red Bull, V, and Roaring Lion etc., as well as ***other adult soft drinks*** (e.g. herbal drinks etc.).

However, for the purpose of this study, soft drinks **do not include**:

Bottled (both flavoured and natural) mineral water such as Evian, Volvic, Ballygowan and Kerry Spring ranges etc.

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C	D	L	G

Mixers such as tonic water, ginger ale, soda water and bitter lemon etc., and ***concentrates*** (also called squash or dilutables) that require the addition of water such as Kia Ora, Mi Wadi, Robinsons, and Ribena etc.

The questionnaire is divided into three distinct sections. **Please answer all questions/tasks, in each section, where applicable.**

SECTION I: AN EVALUATION OF 20 HYPOTHETICAL SOFT DRINKS

In this section of the questionnaire you are presented with 20 hypothetical soft drinks (Products 1 to 20) for evaluation.

Each hypothetical soft drink is described by 6 attributes. These attributes are: Brand, Flavour, Carbonation Level, Added Ingredients, Type of Packaging, and Price.

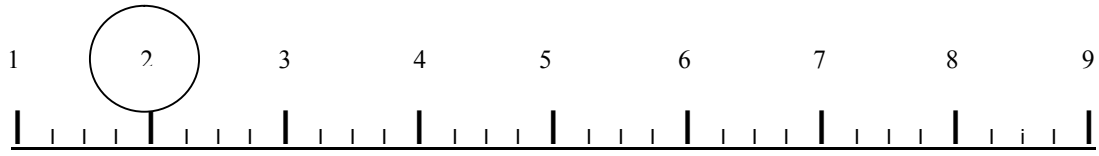
In this survey, **a short description accompanies each attribute** (see example below).

By way of example, the hypothetical soft drink shown below is **described** as a brand you are familiar with. This soft drink is made from a blend of pure orange juice and sparkling spring water. It is a refreshing drink containing B Vitamins, Caffeine and Taurine to stimulate both mind and body. It is packaged in a glass bottle and retails at €2.15 per 250ml.

Brand:	A brand you are familiar with
Flavour:	Made from a blend of pure orange juice and spring water
Carbonation Level:	Sparkling (carbonated)
Added Ingredients:	A refreshing drink containing B Vitamins, Caffeine and Taurine to stimulate both mind and body
Type of Packaging:	Glass bottle
Price:	€2.15 per 250ml

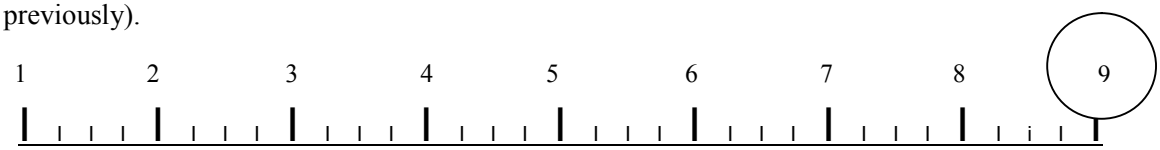
Once you have **carefully read** the product description, you must then **rate** (indicate) how likely you are to **purchase** the hypothetical soft drink. This is done by **circling <u>any</u> number <u>between 1 and 9</u> corresponding to how likely you are to purchase the new soft drink**.

By way of example, if you **disliked** the soft drink described previously you might circle **a low number** (e.g. "**2**" is circled below to indicate a disliking for the soft drink described previously).



Most Definitely Will Not Purchase | **Neither Will Nor Will Not Purchase** | **Most Definitely Will Purchase**

Again, by way of example, if you **liked** the soft drink described previously you might circle **a high number** (e.g. "**9**" is circled below to indicate a liking for the soft drink described previously).



Most Definitely Will Not Purchase | **Neither Will Nor Will Not Purchase** | **Most Definitely Will Purchase**

Remember, the higher the value (as you go from 1 to 9), the more appealing the soft drink is to you, and the more likely you are to purchase it.

INSTRUCTIONS

STEP 1: Carefully read the description (i.e. the six attributes) for Product 1.

STEP 2: You must then **rate** Product 1 **by circling any number between 1 and 9**, corresponding to how likely you are to purchase Product 1, where 1 = most definitely will not purchase and 9 = most definitely will purchase.

STEP 3: Repeat steps 1 and 2 for the remaining hypothetical soft drinks (Products 2 to 20).

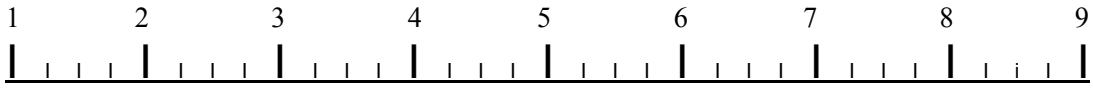
It is important that you judge all 20 hypothetical soft drinks before progressing to Section II of this questionnaire. Do not skip any of the 20 hypothetical soft drinks.

You may now begin evaluating the 20 hypothetical soft drinks

PRODUCT 1

Carefully read the description for **Product 1** below. Then, **rate Product 1** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new brand launched on the market
Flavour:	Lemon & lime flavoured spring water
Carbonation Level:	Sparkling (carbonated)
Added Ingredients:	A refreshing drink containing B Vitamins and natural energy-boosting Ginseng and Guarana
Type of Packaging:	Glass bottle
Price:	€1.70 per 250ml

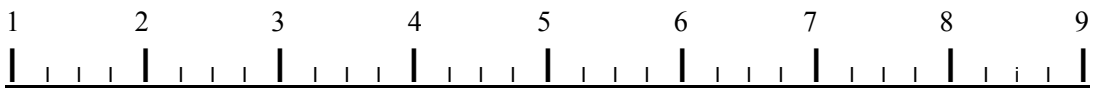


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 2

Carefully read the description for **Product 2** below. Then, **rate Product 2** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new brand launched on the market
Flavour:	Lemon & lime flavoured spring water
Carbonation Level:	Still (non-carbonated)
Added Ingredients:	A refreshing drink with no added vitamins, herbs or other stimulant ingredients
Type of Packaging:	Plastic bottle
Price:	€2.15 per 250ml

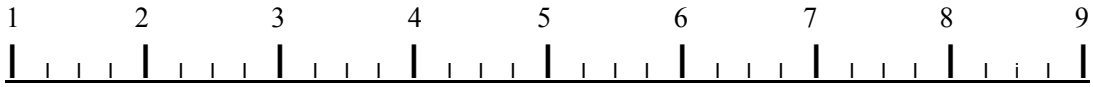


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 3

Carefully read the description for **Product 3** below. Then, **rate Product 3** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new brand launched on the market
Flavour:	Made from a blend of pure orange juice and spring water
Carbonation Level:	Sparkling (carbonated)
Added Ingredients:	A refreshing drink containing B Vitamins, Caffeine and Taurine to stimulate both mind and body
Type of Packaging:	Plastic bottle
Price:	€1.25 per 250ml

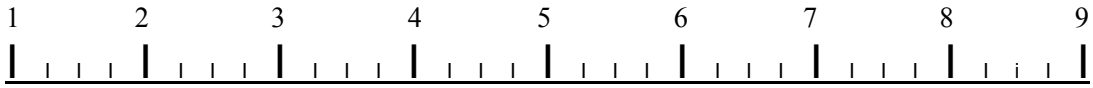


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 4

Carefully read the description for **Product 4** below. Then, **rate Product 4** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A brand you are familiar with
Flavour:	Made from a blend of pure apple juice and spring water
Carbonation Level:	Still (non-carbonated)
Added Ingredients:	A refreshing drink containing B Vitamins and natural energy-boosting Ginseng and Guarana
Type of Packaging:	Plastic bottle
Price:	€1.25 per 250ml

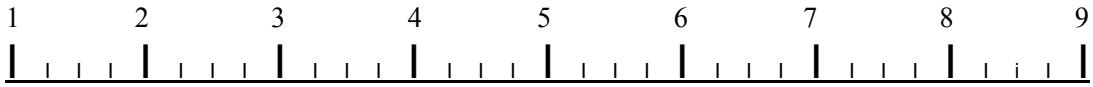


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 5

Carefully read the description for **Product 5** below. Then, **rate Product 5** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new brand launched on the market
Flavour:	Made from a blend of pure orange juice and spring water
Carbonation Level:	Sparkling (carbonated)
Added Ingredients:	A refreshing drink containing B Vitamins, Caffeine and Taurine to stimulate both mind and body
Type of Packaging:	Aluminium can
Price:	€1.70 per 250ml

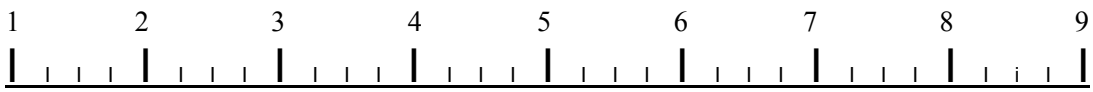


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 6

Carefully read the description for **Product 6** below. Then, **rate Product 6** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new brand launched on the market
Flavour:	Made from a blend of pure apple juice and spring water
Carbonation Level:	Still (non-carbonated)
Added Ingredients:	A refreshing drink with no added vitamins, herbs or other stimulant ingredients
Type of Packaging:	Aluminium can
Price:	€1.25 per 250ml

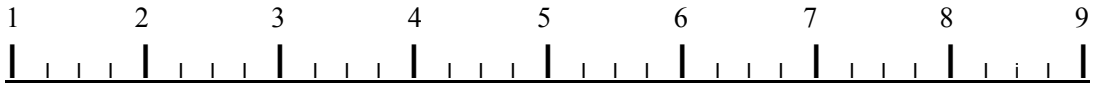


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 7

Carefully read the description for **Product 7** below. Then, **rate Product 7** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new brand launched on the market
Flavour:	Made from a blend of pure orange juice and spring water
Carbonation Level:	Still (non-carbonated)
Added Ingredients:	A refreshing drink containing B Vitamins and natural energy-boosting Ginseng and Guarana
Type of Packaging:	Glass bottle
Price:	€1.70 per 250ml

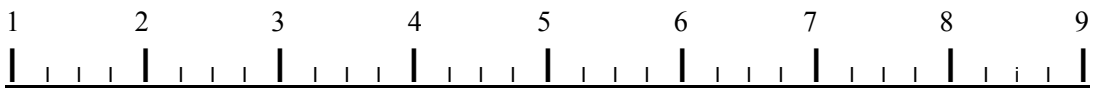


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 8

Carefully read the description for **Product 8** below. Then, **rate Product 8** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new brand launched on the market
Flavour:	Lemon & lime flavoured spring water
Carbonation Level:	Sparkling (carbonated)
Added Ingredients:	A refreshing drink with no added vitamins, herbs or other stimulant ingredients
Type of Packaging:	Glass bottle
Price:	€1.25 per 250ml

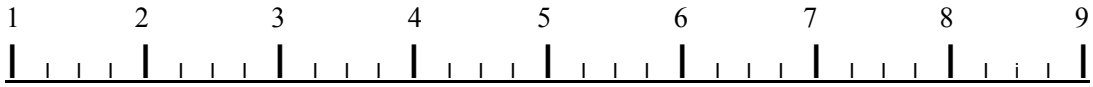


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 9

Carefully read the description for **Product 9** below. Then, **rate Product 9** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A brand you are familiar with
Flavour:	Lemon & lime flavoured spring water
Carbonation Level:	Sparkling (carbonated)
Added Ingredients:	A refreshing drink containing B Vitamins and natural energy-boosting Ginseng and Guarana
Type of Packaging:	Aluminium can
Price:	€1.25 per 250ml

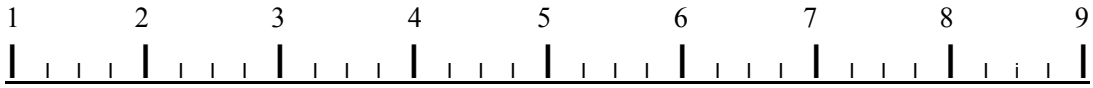


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 10

Carefully read the description for **Product 10** below. Then, **rate Product 10** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new brand launched on the market
Flavour:	Made from a blend of pure apple juice and spring water
Carbonation Level:	Still (non-carbonated)
Added Ingredients:	A refreshing drink containing B Vitamins and natural energy-boosting Ginseng and Guarana
Type of Packaging:	Aluminium can
Price:	€1.70 per 250ml

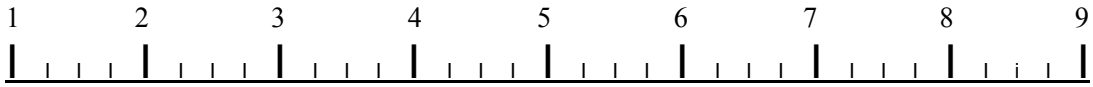


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 11

Carefully read the description for **Product 11** below. Then, **rate Product 11** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A brand you are familiar with
Flavour:	Made from a blend of pure orange juice and spring water
Carbonation Level:	Sparkling (carbonated)
Added Ingredients:	A refreshing drink with no added vitamins, herbs or other stimulant ingredients
Type of Packaging:	Glass bottle
Price:	€1.25 per 250ml

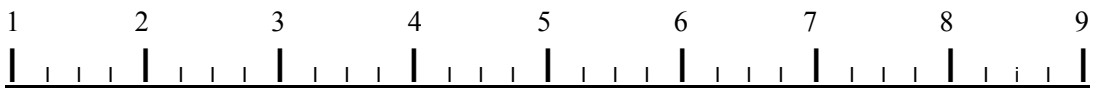


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 12

Carefully read the description for **Product 12** below. Then, **rate Product 12** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A brand you are familiar with
Flavour:	Lemon & lime flavoured spring water
Carbonation Level:	Still (non-carbonated)
Added Ingredients:	A refreshing drink containing B Vitamins, Caffeine and Taurine to stimulate both mind and body
Type of Packaging:	Glass bottle
Price:	€1.70 per 250ml

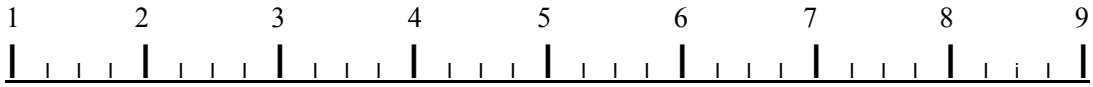


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 13

Carefully read the description for **Product 13** below. Then, **rate Product 13** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A brand you are familiar with
Flavour:	Made from a blend of pure orange juice and spring water
Carbonation Level:	Still (non-carbonated)
Added Ingredients:	A refreshing drink with no added vitamins, herbs or other stimulant ingredients
Type of Packaging:	Glass bottle
Price:	€1.25 per 250ml

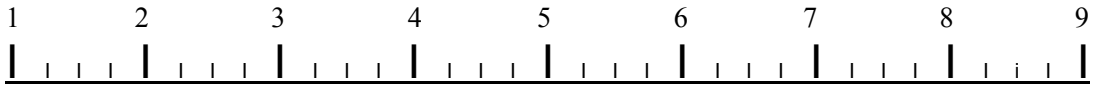


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 14

Carefully read the description for **Product 14** below. Then, **rate Product 14** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new brand launched on the market
Flavour:	Made from a blend of pure orange juice and spring water
Carbonation Level:	Sparkling (carbonated)
Added Ingredients:	A refreshing drink containing B Vitamins and natural energy-boosting Ginseng and Guarana
Type of Packaging:	Glass bottle
Price:	€2.15 per 250ml

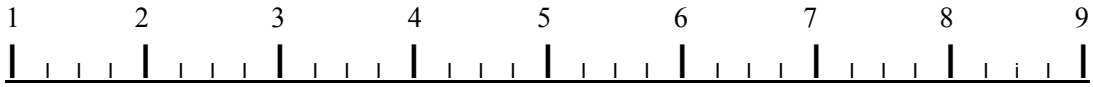


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 15

Carefully read the description for **Product 15** below. Then, **rate Product 15** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new brand launched on the market
Flavour:	Made from a blend of pure apple juice and spring water
Carbonation Level:	Sparkling (carbonated)
Added Ingredients:	A refreshing drink with no added vitamins, herbs or other stimulant ingredients
Type of Packaging:	Aluminium can
Price:	€1.70 per 250ml

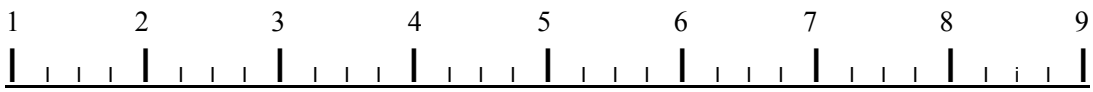


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 16

Carefully read the description for **Product 16** below. Then, **rate Product 16** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new brand launched on the market
Flavour:	Made from a blend of pure apple juice and spring water
Carbonation Level:	Still (non-carbonated)
Added Ingredients:	A refreshing drink with no added vitamins, herbs or other stimulant ingredients
Type of Packaging:	Glass bottle
Price:	€1.25 per 250ml

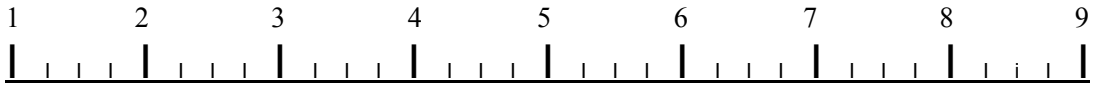


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 17

Carefully read the description for **Product 17** below. Then, **rate Product 17** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A new brand launched on the market
Flavour:	Made from a blend of pure orange juice and spring water
Carbonation Level:	Still (non-carbonated)
Added Ingredients:	A refreshing drink containing B Vitamins, Caffeine and Taurine to stimulate both mind and body
Type of Packaging:	Aluminium can
Price:	€1.25 per 250ml

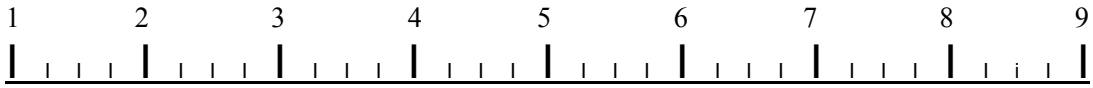


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 18

Carefully read the description for **Product 18** below. Then, **rate Product 18** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A brand you are familiar with
Flavour:	Made from a blend of pure orange juice and spring water
Carbonation Level:	Sparkling (carbonated)
Added Ingredients:	A refreshing drink with no added vitamins, herbs or other stimulant ingredients
Type of Packaging:	Plastic bottle
Price:	€1.70 per 250ml

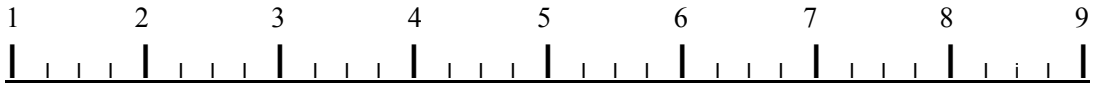


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 19

Carefully read the description for **Product 19** below. Then, **rate Product 19** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A brand you are familiar with
Flavour:	Made from a blend of pure orange juice and spring water
Carbonation Level:	Still (non-carbonated)
Added Ingredients:	A refreshing drink with no added vitamins, herbs or other stimulant ingredients
Type of Packaging:	Aluminium can
Price:	€2.15 per 250ml

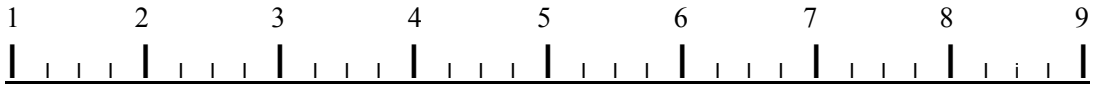


Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

PRODUCT 20

Carefully read the description for **Product 20** below. Then, **rate Product 20** by **circling any number**, ranging from 1 to 9, **corresponding to how likely you are to purchase** it.

Brand:	A brand you are familiar with
Flavour:	Made from a blend of pure apple juice and spring water
Carbonation Level:	Sparkling (carbonated)
Added Ingredients:	A refreshing drink containing B Vitamins, Caffeine and Taurine to stimulate both mind and body
Type of Packaging:	Glass bottle
Price:	€2.15 per 250ml



Most Definitely Will Not Purchase — **Neither Will Nor Will Not Purchase** — **Most Definitely Will Purchase**

SECTION II: PURCHASE PATTERN & CONSUMPTION OF CARBONATED SOFT DRINKS, STIMULANT DRINKS & OTHER BEVERAGES

INTRODUCTION

In this section of the questionnaire you are presented with 7 questions concerning your purchase patterns for, and consumption of, a range of soft drinks, bottled water, fruit juice and other beverages.

Carefully read each question (and accompanying instructions) before attempting to answer each question.

Q1. On average, how often do you purchase <u>each</u> of the following beverages? *Please tick the most appropriate box for <u>each</u> beverage* (**only <u>one</u> answer may be given <u>per beverage</u>**).

	More than once per day	Once per day	4-6 times per week	2-3 times per week	Once per week	Rarely	Never
Natural Mineral Water (e.g. Evian, Volvic etc.)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Flavoured Mineral Water (e.g. Tipperary Lemon & Lime Water etc.)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Pure Fruit Juice (e.g. Sqeez, Tropicana, Fruice etc.)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Juice Drinks (e.g. Robinsons Fruit Shots, Sunny Delight, Capri Sun etc.)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Q2. On average, how often do you purchase <u>each</u> of the following soft drinks (either regular or diet)? *Please tick the most appropriate box for <u>each</u> beverage* (**only <u>one</u> answer may be given <u>per beverage</u>**).

	More than once per day	Once per day	4-6 times per week	2-3 times per week	Once per week	Rarely	Never
Cola (e.g. Pepsi, Coca-Cola etc.)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Orange (e.g. Fanta, Club Orange etc.)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Lemon & Lime (e.g. 7UP, Sprite etc.)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Lemonade (e.g. Club Lemon etc.)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Other Flavours (e.g. Lilt, Cidona etc.)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Sports Drinks (e.g. Lucozade Sport, Gatorade etc.)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Energy Drinks (e.g. Lucozade Energy, Finches Energy etc.)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7
Stimulant Drinks (e.g. Red Bull, V, Shark etc.)	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5	☐ 6	☐ 7

Only purchasers of stimulant drinks *should complete the remaining questions in this section. Therefore, if you answered* ***'never'*** *for purchase of stimulant drinks, do not answer the remaining questions in this section. Instead, proceed to Section III of this questionnaire.*

Q3. At present, which brand of stimulant drink do you most frequently purchase? *Please tick the most appropriate box* (**only one answer may be given**).

Red Bull	☐ 1	Spiked Silver	☐ 10
V	☐ 2	Lipovitan B3	☐ 11
Shark	☐ 3	American Bull	☐ 12
Live Wire	☐ 4	Bull Ring	☐ 13
Red Devil	☐ 5	EJ 10	☐ 14
Dynamite	☐ 6	Enorm	☐ 15
Roaring Lion	☐ 7	Irn Bru	☐ 16
Guarana Speed	☐ 8	Boost	☐ 17
Indigo Extra	☐ 9	Other	☐ 18

Q4. Where do you most frequently drink stimulant drinks? *Please tick the most appropriate box(es)* (**more than one answer may be given**).

At home	☐ 1
On-the-go i.e. in the car, walking etc.	☐ 2
Restaurant/cafe	☐ 3
Before sports	☐ 4
After sports	☐ 5
At work/college	☐ 6
Public house	☐ 7
Nightclub	☐ 8
Other	☐ 9

Q5. Approximately, how many cans/bottles of stimulant drink would you drink in a week? *Please tick the most appropriate box* (**only one answer may be given**).

Less than 1 can/bottle	☐ 1
1 can/bottle	☐ 2
Approx. 2 or 3 cans/bottles	☐ 3
Approx. 4 or 5 cans/bottles	☐ 4
Approx. 6 or 7 cans/bottles	☐ 5
Approx. 8 or 9 cans/bottles	☐ 6
More than 9 cans/bottles	☐ 7

Q6. When do you most frequently drink stimulant drinks? *Please tick the most appropriate box* (**only one answer may be given**).

Between 6.00 a.m. and 12.00 p.m.	☐ 1
Between 1.00 p.m. and 5.00 p.m.	☐ 2
Between 6.00 p.m. and 12.00 a.m.	☐ 3
Between 1.00 a.m. and 5.00 a.m.	☐ 4

Q7. Do you mix stimulant drinks with alcohol (e.g. vodka)? *Please tick the most appropriate box* (**only one answer may be given**).

Always	☐ 1
Sometimes	☐ 2
Rarely	☐ 3
Never	☐ 4
I drink premixed alcoholic stimulant drinks such as Red Square	☐ 5

SECTION III: SOCIO-DEMOGRAPHIC INFORMATION

INTRODUCTION

In this section of the questionnaire you are presented with 10 questions relating to your socio-demographic background. By way of reminder, the information you will provide in this questionnaire is completely anonymous and confidential, and will not be divulged to second or third parties.

Carefully read each question (and accompanying instructions) before attempting to answer each question.

Please answer all 10 questions.

Q1. Gender? *Please tick the box corresponding to your gender.*

Male	☐ 1
Female	☐ 2

Q2. Which age group do you belong to? *Please tick the box corresponding to your age group.*

18-20yrs	☐ 1	30-32yrs	☐ 5
21-23yrs	☐ 2	33-35yrs	☐ 6
24-26yrs	☐ 3	36-39yrs	☐ 7
27-29yrs	☐ 4		

Q3. At present, what level of education have you achieved to date? *Please tick the most appropriate box* (**only one answer may be given**).

No formal education (i.e. did not complete primary school)	☐ 1
Completed primary school (but did not complete Intermediate/Junior Cert.)	☐ 2
Completed Intermediate/Junior Certificate (but did not complete Leaving Cert.)	☐ 3
Completed Leaving Certificate (but did not pursue further education)	☐ 4
Pursuing further education (Certificate; Diploma; Degree(s) etc.)	☐ 5
Completed further education (Certificate; Diploma; Degree(s) etc.)	☐ 6

Q4. What is your marital status? *Please tick the box corresponding to your marital status* (**only <u>one</u> answer may be given**).

Single	☐ 1	Cohabiting	☐ 4
Married	☐ 2	Widowed	☐ 5
Separated/Divorced	☐ 3		

Q5. What is your present occupational status? *Please tick the most appropriate box corresponding to your occupational status* (**only <u>one</u> answer may be given**).

Employed full time	☐ 1	Employment or training scheme	☐ 6
Employed part time	☐ 2	Unpaid work in the home	☐ 7
Self-employed	☐ 3	Retired	☐ 8
Unemployed	☐ 4	Student	☐ 9
Disability allowance	☐ 5	Other	☐ 10

Please state your present, or previous, occupation (where applicable): _____

Please state your partner's present, or previous, occupation (where applicable): _____

IMPORTANT: For the purpose of this study, a household consists of those people that <u>live in the same house **and** compose a family</u> (either married or cohabiting). The household income therefore, refers to the income contributed by all adult members of that household. If you are <u>single</u> (i.e. living at home, living alone, or in accommodation with 'non-family' members) then the household income refers to <u>your personal income only</u>.

Q6. Approximately, what is your <u>weekly</u> household <u>net</u> (i.e. after tax) income? *Please tick the box corresponding to your weekly household net income* (**only <u>one</u> answer may be given**).

≤€99	☐ 1	€600-699	☐ 7
€100-199	☐ 2	€700-799	☐ 8
€200-299	☐ 3	€800-899	☐ 9
€300-399	☐ 4	€900-999	☐ 10
€400-499	☐ 5	≥€1000	☐ 11
€500-599	☐ 6	Decline to Answer	☐ 12

Q7. How many incomes are there in your household? *Please tick the most appropriate box* (**only one answer may be given**).

One	☐ 1
Two	☐ 2
More than two	☐ 3

Q8. How many children aged 17 years and under do you have? *Please tick the most appropriate box* (**only one answer may be given**).

None	☐ 1
1 Child	☐ 2
2 Children	☐ 3
More than 2 Children	☐ 4

Q9. How many children aged 18 years and over do you have? *Please tick the most appropriate box* (**only one answer may be given**).

None	☐ 1
1 Child	☐ 2
2 Children	☐ 3
More than 2 Children	☐ 4

Q10. Which part of your county do you live in? *Please tick the most appropriate box* (**only one answer may be given**).

(City) Urban	☐ 1
(City) Suburban	☐ 2
(County) Rural	☐ 3

Thank you for taking the time to complete this questionnaire