EXPLORING CONSUMERS' USE OF INGREDIENT INFORMATION IN THE FOOD CHOICE PROCESS

by

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ABSTRACT

Food labelling is designed to help consumers make better food choices. Understanding how this information is used becomes increasingly important as relationships between diet and diseases are recognized. Research on food label use has left the list of ingredients under-explored, despite its identification as an important component of the food label. As an internal cognitive process, information use during food choices is difficult to measure without influencing behaviour. To gain insight into this phenomenon, a qualitative methodology examining cognitive and behavioural aspects of food choices was incorporated into a mixed-method approach. A survey measured self-reported nutrition behaviours of 518 Dalhousie students. A screening tool identified surveyed volunteers likely to use ingredient information, 11 of which completed a simulated shopping task that produced rich qualitative data. A theoretical approach to thematic analysis revealed that participants focused on avoidance of negatives when making food choices, employing various strategies to accomplish this goal.

LIST OF ABBREVIATIONS AND SYMBOLS USED

MLIS: Master of Library and Information Studies

NIU Survey: Nutrition Information Use Survey

NLEA: Nutrition Labelling and Education Act

TNT Survey: Tracking Nutrition Trends Survey

GLOSSARY

Allergen declarations and gluten sources – there are 10 common food allergens that must be declared when contained in a product: peanuts, egg, soy, sesame seeds, milk, seafood, tree nuts, sulphites, wheat, and mustard; these declarations begin with a "**Contains,"** which is usually in bold text, and is usually found just under the ingredient list in French and English (Canadian Food Inspection Agency, 2014).

Best before date – indicates the anticipated amount of time before an unopened product, if stored properly, will maintain its freshness, taste, nutritional value, and any other qualities claimed by the producer of the food (Canadian Food Inspection Agency, 2014).

Composition claims – voluntary claims provided at the discretion of the manufacturer that are used to emphasize an ingredient or flavour in a food, such as "No added preservatives or artificial flavours" (Canadian Food Inspection Agency, 2014).

Contextual factors – a combination of two aspects of Furst et al.'s (1996) Food Choice model—*Influences* and *Life Course*—that can be combined into a single concept of information sciences, context; see Section 2.2.

Food choice – used throughout this thesis to describe food-related decision-making; inspired by the conceptual contributions of Furst et al. (1996).

Food label – *all information*—written, printed, or graphic—that is presented on a food's packaging, accompanying the food, or is displayed near the food, which includes both mandated information and that voluntarily provided by the manufacturer (CCFL, 2010).

Health claims – describe potential health benefits of a food if consumed as part of a healthy diet; for example, "A healthy diet rich in vegetables and fruit may help reduce the risk of some types of cancer;" Health Canada has a list of approved health claims, and a product must meet certain criteria to use a health claim; companies can also make general health claims, such as "healthy," "smart," and "nutritious," (Canadian Food Inspection Agency, 2014).

Ideal-focused *Personal System* – a *Personal System* used to avoid ingredients with the goal of achieving some food-related ideal, such as vegetarianism, veganism, healthiness, paleolithic, religious practices, etc.

Information Behaviour – "encompasses information seeking s well as the totality of other *unintentional* and *passive* behaviours (such as glimpsing or encountering information), as well as purposive behaviours that do not involve seeking, such as actively *avoiding* information" (Case, 2007, p. 5)

Information Need – the recognition that one's knowledge is inadequate to satisfy a goal (Case, 2007).

Information Seeking – "a conscious effort to acquire information in response to a need or gap in [an individual's] knowledge" (Case, 2007, p. 5)

List of Ingredients – summarizes all ingredients and components of ingredients that used in the production of a product, listed in order of weight; mandated by Canadian legislation on most pre-packaged food products (Canada Food Inspection Agency, 2014).

Nutrient content claims – highlights an amount of a specific nutrient (such as calories, fat, fiber, sugar, etc.) in a product; for example, "a source of fiber," or "fat-free;" Nutrient content claims are subject to certain regulations laid out by Health Canada, such as that the nutrient advertised must be included in the Nutrition Facts table (Canadian Food Inspection Agency, 2014).

Nutrition Facts table – provides information on serving size, calories, and thirteen important nutrients in a standardized format, as well as % Daily Value that helps the consumer understand if that product contains a little or a lot of a given nutrient. The Nutrition Facts table is mandatory on most prepackaged food products, excluding non-ground raw meat, poultry, and seafood, alcoholic beverages, and certain products that contain few nutrients like coffee and spices. It is referred to as the Nutrition Facts panel in other countries, such as the USA (Canadian Food Inspection Agency, 2014).

***Personal systems* –** the process used to make a food choice, consisting of a combination of *Value Negotiations* and *Strategies*, and heavily dependent on the contextual factors motivating its application (Furst et al., 1996).

Primary Ingredients – the first five ingredients listed in the list of ingredients; a term coined by the principal investigator to describe Phase 2 participants' references to the "first few" ingredients in the list of ingredients.

Strategies – develop over time, becoming heuristic processes used to make food choices, which render the decision-making process more efficient (Furst et al., 1996).

Trigger – used in this thesis to refer to a food or ingredient that triggers a physical reaction related to food allergies, intolerances, and sensitivities. Defined by the principal investigator.

Trigger-focused *Personal System* – a *Personal System* focused on the avoidance of triggers.

Unknown Ingredient – any ingredient that: 1) is entirely unknown to the consumer, in that the ingredient's name has never been observed by the consumer; 2) has been observed on a label before, but the nature of the ingredient is unknown to the consumer; 3) was once known, but has since been forgotten by the consumer. Defined by the principal investigator.

Value Negotiation – the evaluation of a food related attribute; divided by Furst et al. (1996) into 6 categories: monetary considerations, health & nutrition, sensory perceptions, convenience, quality, and managing relationships.

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Chapter 1

INTRODUCTION

1.1. RESEARCH CONTEXT

The study of nutrition behaviour is focused on an important issue with significant social and economic consequences. Although the relationship between diet and disease has been increasingly recognized by authoritative bodies, it has proven difficult to establish a causal link between the consumption of any specific alimentary element to negative health consequences due to the complexity of modern diets (World Cancer Research Fund & American Institute for Cancer Research, 2007). Still, many researchers recognize that the consumption of certain foods can affect the development of certain cancers, hypothesizing that approximately one-third of cancers are related to lifestyle factors such as diet and physical activity (Canadian Cancer Society, n.d.). In Canada, health-care costs associated with diet-related illness were estimated between $4.6 and $7.1 billion in 2008 (Public Health Agency of Canada & Canadian Institute for Health Information, 2011). Despite the known physical effects of an unhealthy diet, the number of overweight and obese Canadians continues to grow, as Statistics Canada (2014) recently estimated that sixty-two percent of Canadian adults are overweight or obese, with the number of obese having effectively doubled in the last twenty-five years to a quarter of the population (The Public Health Agency of Canada & the Canadian Institute for Health Information, 2011). As these statistics continue to rise so will the costs and consequences associated with them, making the need to understand how consumers make food purchase decisions ever more important.

A number of government policies and initiatives have attempted to help consumers make healthier and better informed food decisions, including the mandatory labelling of pre-packaged food products (Herath, Cranfield, & Henson, 2008; Schermel et al., 2014). As consumers have become increasingly distanced from the food production process, both physically and conceptually, with progressively fewer producing any of their own food, they must instead rely on the provision of nutrition information via food label to understand the content of the food they consume (Fernqvist & Ekelund, 2014). Food labelling is

considered a population-level approach to influencing consumer food behaviour (Cowburn & Stockley, 2005), making the essential nutrition information about a given pre-packaged food product available to the majority of consumers at the point of purchase (Health Canada, 2013). Almost a decade after the Nutrition Labelling and Education Act (NLEA) had introduced the Nutrition Facts panel and regulated claims on pre-packaged food products in the USA (Wimberley & McLean, 2012), amendments to the Canadian *Food and Drugs Act* in 2002 instituted similar labelling reforms in Canada (Health Canada, 2013). This legislation requires the provision of a Nutrition Facts table detailing the essential nutrition information per serving of the product, including total energy in calories and the amount (in mass) of each of thirteen essential nutrients, with corresponding percentages of recommended daily intake, in a standardized format (Health Canada, 2008). It also requires the provision of a list of ingredients detailing, with some exceptions, the various ingredients that have been incorporated into the production process of a food product, as well as regulates various claims that can be made about a pre-packaged food product (Health Canada, 2014). All mandated label information must be presented in both French and English (Mackey & Metz, 2009). However, while these legislated food label components are tightly regulated, all supplementary information on food packaging is provided at the discretion of the producer or importer (Sacco, Sumanac, & Tarasuk, 2013).

Food labels are generally considered to be the most accessible and commonly used source of nutrition information for consumers (Drichoutis, Lazaridis, & Nayga, 2006; Campos, Doxey, & Hammond, 2011; Lioutas, 2014), which is consistent with findings in Canada since the mid-1990s through the *Tracking Nutrition Trends* (TNT) surveys (Canadian Council of Food and Nutrition, 2009). The rise of another commonly used source of nutrition information has been tracked in Canada since 1997, as 6% of respondents indicated having used the Internet as a source of nutrition information in that year, which has since grown to over half (Canadian Council of Food and Nutrition, 2009). Younger Canadians are more likely to use the Internet as a source of nutrition information. Further, Canadians trust the Internet as a source of nutrition information (Canadian Council of Food and Nutrition, 2008), even though approximately 80% of pages visited and time

searching online is spent on commercial sites, while the most accurate and reliable information is provided by non-commercial, government websites (Ostry, Young, & Hughes, 2008). As the importance of the Internet as a source of nutrition information continues to grow, so has its accessibility as a source of information; according to J. D. Power & Associates (2014), 73% percent of Canadians possess a smartphone. These devices have allowed 58% of Canadian Internet users to access the Internet from a handheld device in 2012 (Statistics Canada, 2013). According to Breikss (2012), who cited a Google conference in an Infographic related to mobile Internet searching, upwards of 77% of Canadians have used their mobile phones to access the Internet while shopping. With this increased capacity to search for information upon encountering an unknown, it is possible for Canadian consumers to search for nutrition information in-store upon encountering some unknown information on the food label.

Still, the most recent TNT survey reported that only about half of Canadians use the Internet as a source of nutrition information, while approximately 70% use food labels (Canadian Foundation for Dietetic Research, 2013). Though perhaps the two most popular sources of nutrition information, there are many others, including, friends, family, acquaintances, health professionals, television, radio, government agencies, social networking sites, consumer organizations, booklets, newspapers, magazines, etc. (Lioutas, 2014). Pohlmeier, Reed, Boylan, and Harp (2012) found that, apart from food labels, student consumers tended to rely most on the Internet, television, and magazines for nutrition information. As noted about, government mandated nutrition labelling is a popular tool that has been implemented around the world to help consumers make better food choices. The idea is that, provided with reliable nutrition information, and educated about the relationship between diet and personal health, consumers will make risk-reducing dietary decisions (Balasubramanian & Cole, 2002). As an important factor affecting food purchase decisions, many studies have attempted to examine various aspects of consumers' understanding and use of food label information.

1.2. RESEARCH RATIONALE

Researchers around the world have explored the relationship between the consumer and food labelling from a variety of academic disciplines, producing a significant volume of relatively dispersed literature (Cowburn & Stockley, 2005; Drichoutis et al., 2006; Grunert & Wills, 2007; Leathwood, Richardson, Sträter, Todd, & van Trijp, 2007; Campos et al., 2011; Hieke & Taylor, 2012; Fernqvist & Ekelund, 2014). However, there has been comparatively little attention directed toward consumers' understanding and use of the list of ingredients. This trend persists despite quantitative evidence suggesting that the list of ingredients is used by consumers and plays an important role in the food choices of many Canadian (Canadian Council of Food and Nutrition, 2008; Canadian Foundation for Dietetic Research, 2013), as well as American (Ollberding, Wolf, & Contento, 2011), consumers. The importance of ingredient information to Canadian consumers was reflected in feedback voiced through the *What We Heard* campaign (Government of Canada, 2014), which has led to the announcement of several prospective reforms to food labelling in Canada, several of which could affect the formatting and content of the list of ingredients.

The list of ingredients is an essential component of the food label that reveals the nature of the contents of the product by detailing the various ingredients that have been added in the food production process (Canadian Food Inspection Agency, 2014). There may be any number of contextual factors behind the desire to understand the contents of food. Of the many variables measured in the study of food label information use, motivation may be the most important – when motivated by health, as opposed to taste or price (Drichoutis Lazaridis, & Nayga, 2005), a consumer is much more likely to use food label information (Visschers, Hess, & Siegrist, 2010). For many consumers, health motivation can vary from day to day, depending on the many contextual influences influencing one's conception of healthiness; but for others, such as those with allergies or chronic illnesses, health motivation can assume a more static form that is not voluntary but prescribed from necessity. For the former segment, any number of contextual factors can motivate the individual's desire to understand the content of food to varying degrees, but the consequences of misunderstanding are limited to personal dissatisfaction. For the latter

segment, there may only be a single primary factor motivating the drive to understand the content of foods, but failure to understand it can have serious health consequences.

As discussed in Section 1.1 above, research dedicated to understanding how consumers use list of ingredients has been relatively limited. While there have been a number of studies, such as the *Tracking Nutrition Trends VII* report (Canadian Council of Food and Nutrition, 2008), that have measured some aspects of ingredient information use, the majority of research has focused on other components of the food label (Campos et al., 2011). While this has produced a gap in the knowledge related to the use of the list of ingredients, some findings related to food label information use in general, such as the tendency for consumers to focus on information related to negative attributes over positive attributes (Balasubramanian & Cole, 2002), have implications for the use of ingredient information, although such findings have not been extended to the list of ingredients. Further, as the complexity of the modern food production system has made it increasingly difficult for the average consumer to understand the nature of the content of all the pre-packaged foods consumed (Dixon, 2007), it is logical to assume that the average consumer encounters unknown ingredients with some frequency. The purpose of this thesis is not only to explore how consumers use ingredient information when making food purchase decisions, but also to explore how consumers react to unknown ingredients, and if they engage in any supplementary information seeking upon encountering an unknown ingredient – prompting the following research questions:

Research Question 1: How do consumers use ingredient information when making food purchase decisions?

(A) Do they look for the presence or the absence of certain ingredients?

(B) How do they react to foods with unknown or unfamiliar ingredients?

Research Question 2: What types of supplementary information seeking behaviours are prompted by the list of ingredients?

1.3. RESEARCH CONTRIBUTIONS

This research project will make theoretical, methodological, and practical contributions to the study of food label information use, while addressing a significant gap in the knowledge related to consumers' use of food label information when making of food choices. As this is a problem related to both behaviour and cognition, a qualitative approach that incorporates both conversation and actual food choices would be the most effective way to gain real insight into how consumers actually use ingredient information in the decision-making process. As decision-making is an internal, cognitive process that is not naturally vocalized, it can be difficult to examine – especially without affecting participant behaviours (Variyam, 2008). In order to gain insight into the individual-level experience of incorporating ingredient information into the decision-making process, a qualitative measure incorporating conversation with participants is necessary (Stewart, Makwarimba, Barnfather, Letourneau, & Neufeld, 2008). Incorporating a behavioural component will further increase the validity of the findings by confirming self-reported data with actual demonstrated food label information use (Barnett, Vasileiou, Gowland, Raats, & Lucas, 2013).

A novel mixed methods approach was employed to study this problem. The Nutrition Information Use Survey (see Appendix A) was used to collect quantitative data during Phase 1 of the study, serving to contextualize the sampled population within the greater body of research and to inform the research questions outlined above. A simulated shopping task was designed to collect qualitative data during Phase 2 of the study, where participants were presented with several real pre-packaged food products and asked a series of purchase-related questions about those products (see Appendix B). Unlike many studies related to food label information use, this study focused exclusively food label information users. To accomplish this, a Screening Tool was applied to the Phase 1 sample to identify those most likely to be frequent food label users, and who were asked to participate in Phase 2 (see Section 4.3). This ensured the rich collection of qualitative data by limiting Phase 2 of the study to those who described the frequent use of food label information in Phase 1, as well as a reliance on the list of ingredients.

This research project is grounded in the study of information science, drawing specifically from a sub-topic of user studies commonly known as information-seeking behaviour. As the acquisition of information is a fundamental component of the decision-making process, this is an appropriate conceptual foundation from which to conduct a study related to the use of nutrition information. As a theoretical contribution to the study of food label information use, this thesis has aimed to strengthen the link between the study of information behaviours and nutrition information use, relying heavily on Furst, Connors, Bisogni, Sobal, and Falk's (1996) Food Choice model to connect the two disciplines, incorporating this model into the theoretical framework (see Section 2.2), and using it to structure the thematic analysis of Phase 2 of the study (see Section 4.5).

By adopting a novel mixed-method approach grounded in a theoretical framework from the information sciences, this study on the use and understanding of ingredient information explores consumer understanding and use of the list of ingredients from a unique perspective. This research project will attempt to further the understanding of consumers' use of food label information by focusing on the nature and extent of ingredient information use in the food choice process.

1.4. THESIS OUTLINE

Chapter 2 presents the theoretical framework of this project. Chapter 3 consists of a literature review summarizing the knowledge related to food label information use. Chapter 4 describes the mixed-method approach employed in this study, the sampled population, and the tools used to collect and analyze data. Chapter 5 summarizes the findings and implications of Phase 1 and their implications, and Chapter 6 summarizes the findings and implications of Phase 2. Chapter 7 synthesizes the major findings of this study within the established body of knowledge related to food label information use. Chapter 8 concludes this thesis with a discussion of the theoretical and practical implications of these findings, before considering the limitations of the study, some concluding remarks, and recommendations for future research.

Chapter 2

THEORETICAL FRAMEWORK

2. OVERVIEW

The theoretical framework for this research project has drawn from works spanning several academic disciplines, but it is fundamentally grounded in the study of Information Science within a sub-genre of User Studies called Information-Seeking Behaviour (Wilson, 2006). Information science is a multi-disciplinary field with a scope so broad that transcends all aspects human behaviour. While this study will focus on specific aspects of human behaviour—namely consumer behaviour and nutrition-/diet-related behaviour—the underlying current of thought and theory will be tied to the seeking, understanding, and use of information in the making of food purchase decisions.

First, this section will ground this research project with foundational theories of information science, drawing primarily from fundamental theories of information-seeking behaviour from T. D. Wilson and R. Savolainen. Second, the connections between these fundamental theories of information behaviour and consumer behaviour, which focus on the seeking, understanding, and use of nutrition information, will be considered, particularly in relation to the decision-making process. Finally, a brief consideration of the implications of recent technological advances on the concepts incorporated into the theoretical framework, particularly in their relation to nutrition information behaviour, will be discussed.

2.1. INFORMATION SEEKING BEHAVIOUR

This research project is grounded in the long-standing effort to explore the nature of human behaviour in response to the need for information. The study of information behaviour concerns all aspects of human behaviour that involve the active and passive communication of information through any medium (Wilson, 2000). Information-seeking behaviour is a sub-genre of information behaviour, described as the dynamic and reactive process of information acquisition to satisfy an information need (Wilson, 2006). An

information need is actually a secondary need that results from a more essential primary need (Wilson, 1999). A primary need manifests upon the realization of a discrepancy between one's current and desired states of being (Lioutas, 2014). Primary needs are commonly broken up into one of three interrelated categories of need: physiological, emotional, or cognitive (Wilson, 2006). Information-seeking behaviour involves the finding, interpreting, and using information to satisfy an information need, which may arise from any single or combination of primary need(s); this satisfaction is not a quantifiable end that demands a set amount of information, but is instead dependent on the individual's perception of what information is needed and an evaluation of the discovered information using criteria like reliability, comprehensiveness, and usefulness (Lioutas, 2014). Wilson's (1997) comprehensive model of information behaviour presents information-seeking behaviour as part of a perpetual phenomenon that does not end with the use of information, but continues into the recognition of some new information need with a modified body of knowledge (Figure 1).

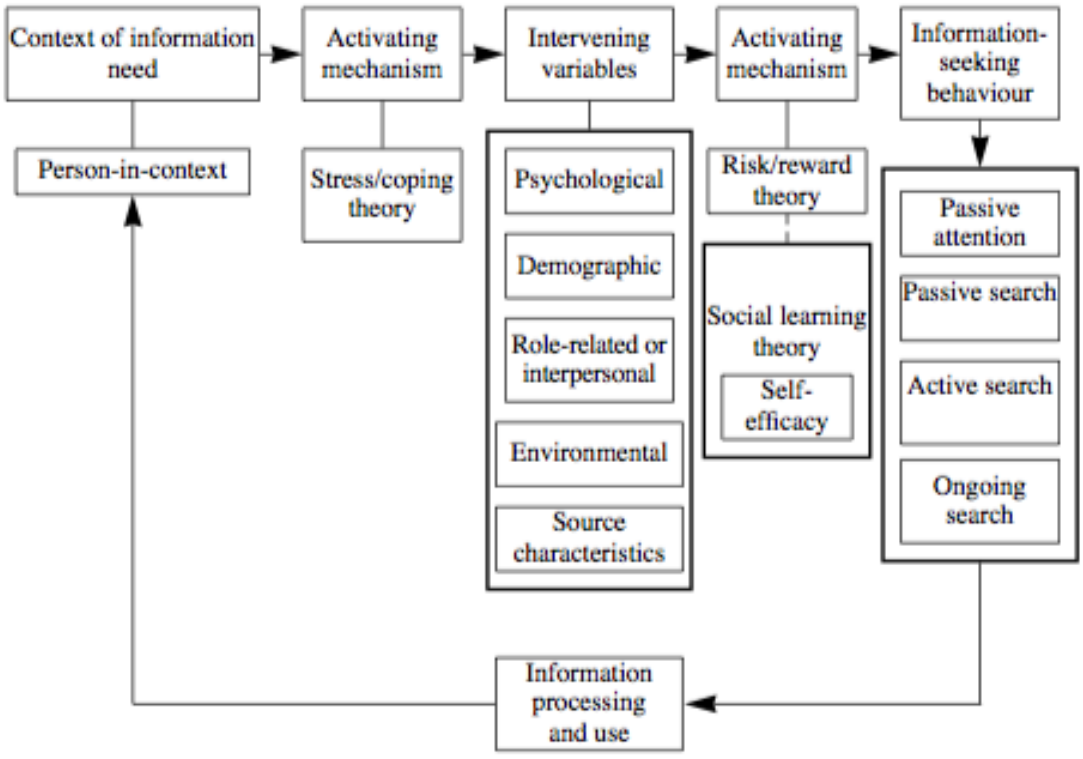


Figure 1. A revised general model of information behaviour (Wilson, 1997, p. 569)

The implication of this model is that information-seeking behaviour is not a finite, isolated occurrence with a beginning and an end, but a continuous life-long cycle through which personal knowledge is built and refined. While the term knowledge is absent from the model, the use of the term 'context' implies the (at least partial) conversion of the acquired information into knowledge, upon which the information need is then re-assessed and, if unsatisfied, the process continues. Wilson's (1999) definition of context is consistent with others that will be further elaborated upon below consisting of the physiological, emotional, and cognitive state of the individual within a social and environmental reality, with specific consideration for the various personal barriers that may impede the individual dependent on this context.

The cyclical nature of information-seeking behaviour means that, while a deliberate effort may result in failure, there is no 'end' – only a progressive development or refinement of the individual context (Wilson, 1999). The information need will persist and it may be any amount of time before, upon the discovery of necessary information, the need is satisfied, and there are surely many information needs that are never satisfied. Wilson's (1997) model suggests that there are the various aspects of information seeking, which includes both active and passive searching to various degrees of intensity; the nature of the information-seeking behaviour depends on the intensity of the primary need inspiring it, with higher stakes resulting in more a more elaborate and thorough process of information seeking (Visschers et al., 2010). If a need is not attributed enough significance, there may be no information seeking that occurs (Lioutas, 2014). The reality is that a constant cycle of primary needs is an inherent characteristic of everyday existence, while the satisfaction of corresponding information needs is critical for solving complex problems related these primary needs, as well as completing the simplest daily activities.

Savolainen (1995) proposed the concept of everyday life information seeking (ELIS) in an effort to account for the many instances of information seeking that are not conducted in professional or academic environments, where much of the prior research and consideration had been directed, but related to common activities characteristic of everyday life (Figure 2). Savolainen (1995) introduced two novel concepts that account for daily information-seeking behaviours: the first concerns the natural information-seeking

resulting from one's 'way of life' that enables the making of everyday life decisions (p. 262), while the second concept concerns the continual collection of orienting information related to the 'mastery of life' that result in the construction of a worldview and values that give meaning or purpose to life (p. 264). The framework for the individual's 'mastery of life' is derived from the culture and social class that is born into, but continues to develop and refine throughout life depending on the experiences of the individual (Savolainen, 1995). The model implies constant exchange between the two concepts with the results of one's 'way of life' decisions informing whether the order derived from one's 'mastery of life' is effective, determining whether or not it needs reconfiguring (Savolainen, 1995).

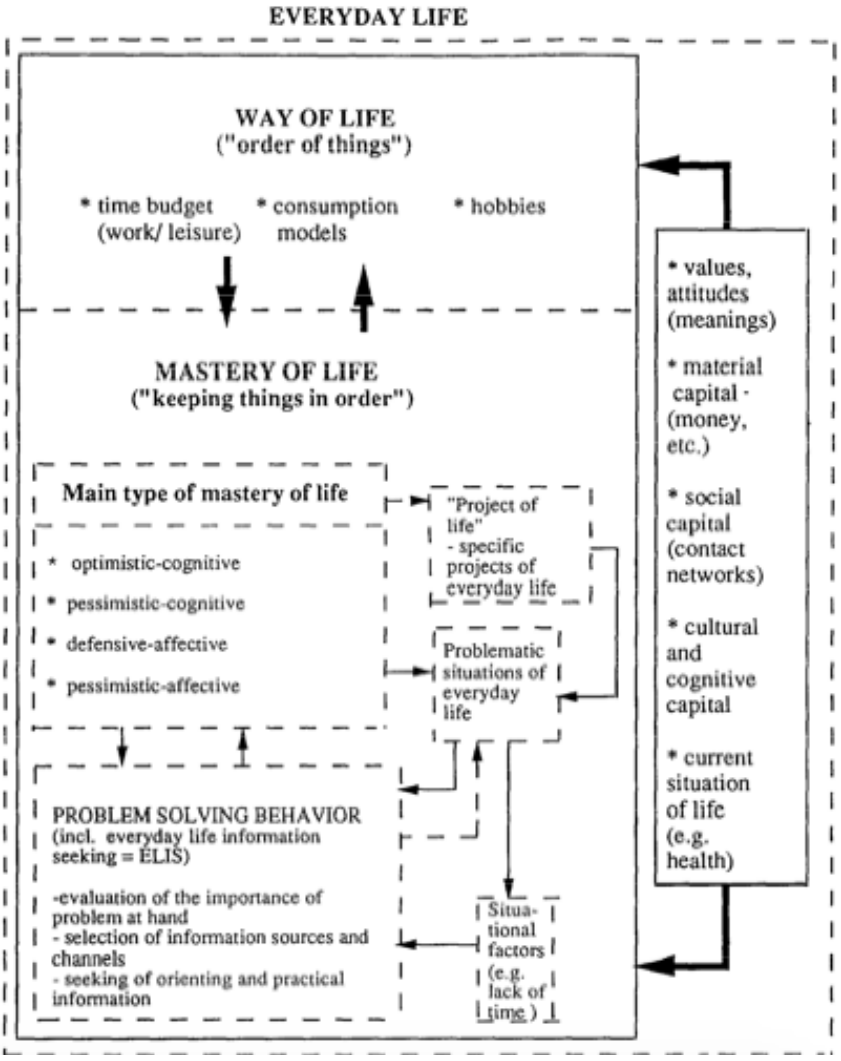


Figure 2: The Basic Components of the Study of ELIS in the context of Way of Life (Savolainen, 1995, p. 268)

The model accounts for a number of important considerations that affect daily information behaviour—such as situational factors and problematic situations—that are not constants but impact each circumstance differently (Savolainen, 1995). Also, central to this concept of the 'mastery of life' is a disposition toward problem-solving situations, which has been conceived by Savolainen as a balance between two dimensions; the first dimension concerns the role of reason in one's problem-solving tendencies, while the second dimension concerns one's confidence toward problem-solving (Savolainen, 1995). The result is a spectrum of problem-solving tendencies that affects how and if an individual attempts to solve problems in everyday life. While many instances of ELIS are conscious efforts to obtain problem-specific information (Savolainen, 2008), we must also consider another equally important aspect of information behaviour that concerns the passive acquisition of information.

Included in Wilson's (1997) model (see Figure 1) is the concept of passive attention. Wilson (1977) was the first to propose that useful information could be, and often was, encountered passively, suggesting that people naturally monitor the surrounding environment to collect relevant information from a variety of sources, such as other people or the media (Williamson, Qayyum, & Liu, 2012). Erdelez (1999) called this phenomenon *information encountering*, suggesting that either problem-related or interest-related information could be encountered. Problem-related information encountering occurs when information related to an information need that has already been recognized but has not yet been satisfied is encountered while performing some unrelated activity; on the other hand, interest-related information encountering occurs when useful information that is not related to an existing information need is encountered and recognized as valuable by the individual (Erdelez, 1999). Implied in this concept is the idea that the individual may not recognize an information need until new information is encountered (Williamson, 1998); in such circumstances, the individual is not aware of a gap in knowledge until having discovered this new information, which may prompt further information-seeking behaviours (Wimberley & McLean, 2012). Bates (2002) estimated that upwards of 80% of knowledge is the product of one's conscious and sentient presence within social and physical contexts. Realistically, we are constantly encountering information from any number of sources, as

experienced through the five senses, and humans have evolved to be experts at minding specific stimuli and ignoring the rest. Whether active or passive, conscious or subconscious, it is human nature to constantly collect and interpret information from the surrounding environment in order to effectively exist within it and to formulate a perception of reality.

The development of knowledge is, of course, a lifelong process. It is developed through the cyclical process of *information use*, as represented in Wilson's (1997) model, and defined by Wilson (2000) as "the physical and mental acts involved in incorporating the information found into the person's existing knowledge" (p. 50). When new information is discovered it is processed and contrasted against one's established body of knowledge, either reinforcing the established body of knowledge or becoming incorporated, to varying degrees, into the modified body of knowledge (Leathwood et al., 2007). This is a process of inference making – newly acquired information is interpreted by comparison with the established body of knowledge, and inferences are made about this new information based on what is already known, either forming new knowledge or reinforcing that which was already known (Grunert, Scholderer, & Rogeaux, 2011). However the ability to procure, understand, and use new information to form knowledge can vary tremendously depending on the individual.

One's capacity for understanding and using new information, as well as for recognizing useful information when not necessarily looking for it (Williamson et al., 2012), depends on the individual *context*. Broadly speaking, context consists of all external and internal factors affecting the individual, including one's genetics, mental and physical capacities, education, financial resources, personality, social network, interests, the surrounding physical environment and one's entire life experience (Courtright, 2007). When speaking of the context of the individual, considering the broadest possible definition is the most interesting – context is the reality of the individual as interpreted and experienced by that individual in a given moment (Courtright, 2007). Upon assuming this broad definition of context, it is apparent that all contexts are unique to the individual, as well as to a precise moment in time (Dervin, 1999). Therefore, given this temporal consideration, in addition to the progressive, lifelong development of knowledge, as well as

continual changes to the social and physical environment, the individual's context is itself always changing, however slight these changes may be. This makes the study of information behaviour both challenging and intriguing, as no two individuals—and further, no two situations—can have the exact same context, nor information experience.

The *information horizon* is an effective conceptual framework that can help understand the nature of the relationship between the individual, the environment, and the various sources of information that exist within that environment. First proposed by Sonnenwald (1999), the information horizon represents the various sources of information available to an individual upon the recognition of an information need. This concept invokes the image of a figurative horizon in which the information resources that are most likely to be used appear nearer in the horizon and those less likely sources appear further away (Sonnenwald, 1999). Savolainen & Kari (2004) adopted and modified this concept, proposing instead an *information source horizon* intended to measure information source preference in situations of active information seeking. Upon the recognition of an information need, the information source horizon considers the various information sources available to the individual, considering evaluative factors like accessibility or quality, and places them within the figurative horizon based on their significance to the individual information seeker (Savolainen & Kari, 2004). Savolainen & Kari (2004) proposed two different types of horizon: the first is a stable horizon that reflects consistent preference for certain sources of information regardless of the circumstance, while the second is a dynamic horizon that is problem-specific. Lioutas (2014) notes several factors that affect the selection of an information source, including convenience of and familiarity with the source, estimated benefit, perceived trustworthiness, availability, accessibility, and credibility. Another important consideration put forth by Savolainen & Kari (2004) is that the information horizon falls within the broader context of the "perceived information environment," meaning that an information source can only be situated within an information source horizon if the information seeker is aware of the source and recognizes it as a potential source of information when the information need is recognized (p. 418). The development and popularization of new technologies will inevitably have a profound impact on the nature of the information source horizon; for example, the growing

prominence of smartphone technology has tremendously affected the accessibility of information at any time, as the user now has the capacity to browse the web upon a whim using the pocketed smartphone, and is perhaps already the preferred (and most convenient) source of information.

2.2. FOOD-RELATED DECISION-MAKING

According to Wansink and Sobal (2007), people make an average of 221 food-related decisions per day. The motivations behind food-related decisions could be subjected to the same basic categorization scheme of primary needs—physiological, emotional, or cognitive (Wilson, 2006)—but others have attempted to further explore the food-related decisions specifically, identifying many factors that affect this specific type of decision-making. For example, Blaylock, Smallwood, Kassel, and Variyam (1999) proposed that food decisions are dependent on a complex combination of physiological, psychological, social, spiritual, and economic factors, while Steptoe, Pollard, and Wardle (1995) identified nine factors that can affect food choices – taste, healthiness, price, mood, convenience, natural content, weight control, familiarity, and ethics. Each of these attempts tends to overlap to some degree, but what can confidently be stated is that three factors—taste, price, and healthiness—tend to be consistently ranked the three most important factors affecting Canadians' food choices (Canadian Council of Food and Nutrition, 2008).

To consider food-related decision-making, Furst et al.'s (1996) Food Choice model fits well into this theoretical framework for several reasons. First, the Food Choice process as presented in this model begins with a combination of factors—*Life Course* and *Influences*—that combine to form the context, as discussed in the previous section (see Section 2.1). Essentially, the *Life Course* consists of all past social, cultural, and physical experiences that are key in the formation of the individual context (Furst et al., 1996). Throughout this *Life Course*, the individual develops and realizes ideals, personal factors (derived from physiological and psychological needs), resources (such as money, knowledge, and technology), as well as leads to a social framework and a food context (being the social and physical setting in which the food decision is made, which includes

the availability of food) – all of which combine to form the context that is unique to the individual and to each food choice that is made, all the while influencing the development of one another, reinforcing and competing depending on the concerns and initiatives of the individual consumer (Furst et al., 1996). Over time, each individual develops and refines a *Personal System* that is used to make Food Choices (see Figure 3).

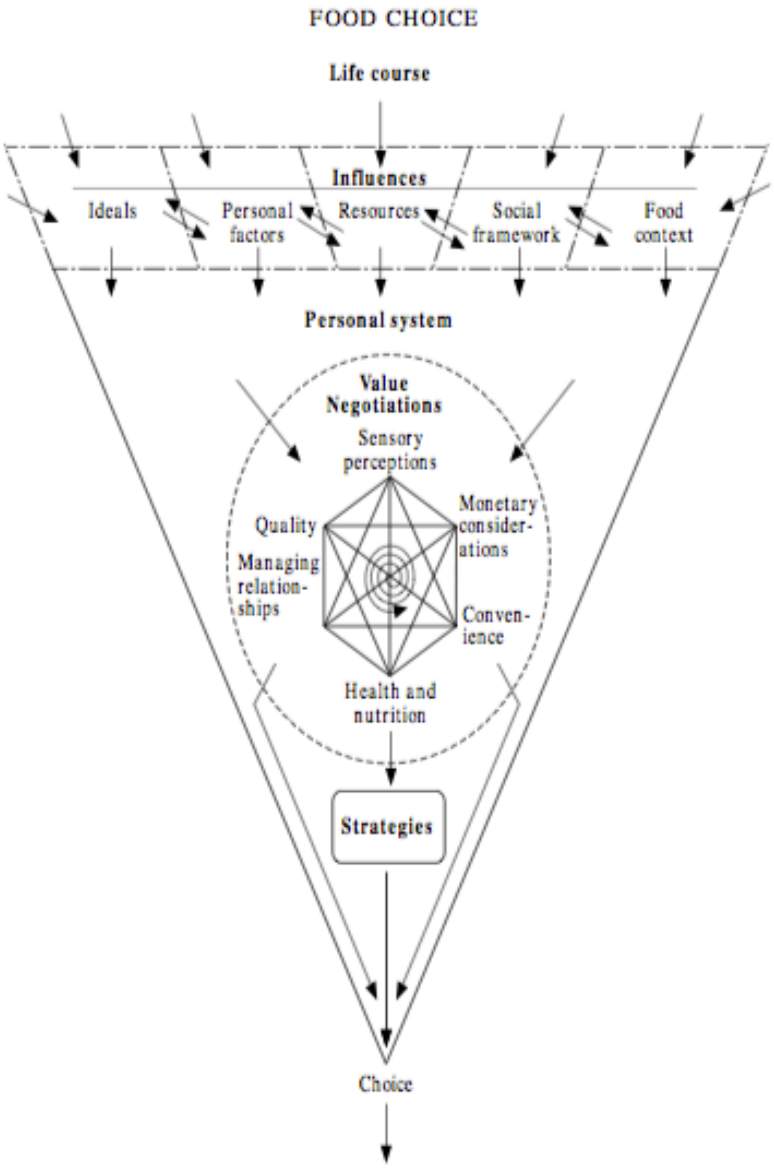


Figure 3: A conceptual model of the components in the food choice process (Furst et al., 1996, p. 251)

Arguably, Furst et al. (1996) describes a personal process of information seeking behaviours used to make Food Choices, as all *Value Negotiations* and *Strategies* are dependent on the acquisition of information. The *Personal System* consists of a combination of *Value Negotiations*, which reflect the concerns and initiatives of the consumer, and *Strategies* that develop over time to facilitate the decision-making process. *Value Negotiations* are an evaluation of some attribute of a food product, broken up by Furst et al. (1996) into six categories: sensory perceptions (taste), monetary considerations (cost), health and nutrition, convenience, quality, and managing relationships. The nature and importance of *Value Negotiations* depend on the individual's context—or *Life Course* and *Influences*—affecting not only what information is considered, but also how it is understood and used. The *Personal System* is an established protocol of information seeking behaviours related to making Food Choices, which reflects the primary needs of the individual. While many consumers are bound to monetary considerations or to hedonic satisfaction, others consider a variety of *Value Negotiations* when making food purchase decisions. Further, as the individual refines a *Personal System*, various *Strategies* may be implemented to help make these decisions, which often manifest as standardized rules or heuristic shortcuts that render the decision-making process more efficient (Furst et al., 1996). Instead of considering all possible factors, a growing number of studies have found that many depend on heuristic strategies of relying on a few important pieces of information to make food decisions (Scheibehenne, Miesler, & Todd, 2007). Given that Wansink and Sobal (2007) estimated that the standard Western consumer makes an average of over 200 food-related decisions every day, the incorporation of heuristic *Strategies* into one's *Personal System* can greatly increase the efficiency with which food-related decisions are made (Scheibehenne et al., 2007). However, noted by Cohen and Babey, (2012), an over-reliance on any one heuristic strategy can result in systematic errors or the selection of inferior products.

It is important to remember that a *Personal System* is a fluid process that can change over time, as well as between circumstances (Furst et al., 1996); for example, while one's *Personal System* may otherwise be quite rigid, a specific social circumstances surrounding a Food Choice may prompt the individual to break from protocol to participate fully in a

social or cultural experience, consuming a food that may otherwise be refused. Throughout life, every individual develops some form of a *Personal System* through the continual interplay between Savolainen's (1995) 'way of life' and 'mastery of life' concepts, as the knowledge and initiatives developed through 'mastery of life' processes influence 'way of life' decisions, while 'way of life' decisions may prompt the pursuit of 'master of life' initiatives. While some are most influenced by basic factors like taste and price, the reality is that many are subject, to varying degrees, to a complex combination of factors, dependent on the individuals' *Life Course* and corresponding *Influences*, and the specific circumstance in which the Food Choice is made, as presented in Furst et al.'s (1996) model (see Figure 3). Among these many factors and emerging as the central focus of this research project is the varying degree of importance attributed to the nutrition information provided on food labels in the making of food purchase decisions, focusing specifically on the list of ingredients.

2.3. NUTRITION INFORMATION BEHAVIOUR

As a secondary need, the seeking of nutrition information is heavily dependent on the significance of the primary need motivating the need for information. As indicated above, an intense physical need, such as the avoidance of an allergen that triggers a serious reaction, will be more likely to prompt an invested process of information-seeking (Barnett et al., 2011a), as the consequence of failure could be death; a less intense physical need, such as the desire to reduce carbohydrate intake with a goal of weight loss, will presumably prompt a less intense information search, which will vary depending on any additional primary needs of the individual (Visschers et al., 2010). That is not to say that an intense desire to lose weight via reduced carbohydrate intake cannot induce more intense information searching than a mild allergy – consider Savolainen's (1995) proposal that ELIS behaviour is dependent on the individual's disposition toward problem-solving. Not only is the intensity of the information-seeking behaviour affected by the nature of the primary need, but the type of the information sought is affected as well. The avoidance of a serious allergen may prompt an intense need for nutrition information, as can many other food-related factors, such as ethical considerations, religious practices, and healthiness

(Furst et al., 1996). Complicating the consideration of nutrition information needs is the individual's capacity for understanding information, which depends on the context from which the information is perceived (Furst et al., 1996; Courtright, 2007). One's ability to evaluate the reliability, comprehensiveness, and usefulness of information varies tremendously per individual (Lioutas, 2014). This variability in consumers' capacity for understanding nutrition information has been identified throughout the literature (Cowburn & Stockley, 2005; Drichoutis et al., 2006; Leathwood et al., 2007; Grunert & Wills, 2007; Campos et al., 2011). Though a need for nutrition information may exist, one's ability to satisfy that need may be limited by any number of contextual factors that affect the individual's capacity to understand information (Lioutas, 2014). The daily economics of food decisions—evaluating the availability, convenience, cost, healthiness, and prospective taste of a seemingly infinite number of food options—inevitably involves some degree of information-seeking behaviour (Blaylock et al., 1999), while the context from which these decisions are made is the product of a lifetime of ELIS behaviours.

While individual food decisions may demand specific information and a deliberate information seeking process similar to that conceptualized by Wilson (1997), there are other forms of information behaviour that can contribute toward the creation of nutrition-related knowledge. Information gathering describes a continual effort to collecting information related to a topic without any specific goal beyond learning more about that topic so as to develop knowledge and enable future decisions (Wimberley & McLean, 2012). Information gathering would fall within Savolainen's (1995) 'mastery of life' concept, as the knowledge developed through it could inform future 'way of life' decisions (Wimberley & McLean, 2012). Information gathering inevitably plays an important role in orienting the consumer in the modern world. The individual may be subjected to a variety of sources of information concerning the same topic, which are processed, contrasted, and distilled to form a perception; specifically regarding food, the manufacturer, distributors (supermarkets), media, and government should all be considered distinct sources of information that can deliver information with a bias to the consumer about a particular food-related topic (Wimberley & McLean, 2012). Consumers may also engage in berrypicking (Bates, 1989), a dynamic information-seeking process in which a query

evolves over time in reaction to each new piece of information that is uncovered, prompting new thoughts and further searching (Wimberley & McLean, 2012). Of course, the nature of these concerns and interests, as well as the corresponding information-seeking behaviour, depends on the nature of the individual, as discussed in relation to the models of Savolainen (1995) and Furst et al. (1996). It is through these various information behaviours that individuals develop nutrition knowledge throughout their lives, built through the cyclical process of information behaviour as presented in the model from Wilson (1997).

Consumers with greater interest in nutrition are inevitably more likely to gather and use nutrition information, developing and refining nutrition knowledge. Nutrition knowledge is important as it affects the conceptual and substantial understanding of nutrition information, which has a direct impact on the inferences made about a product based on that information (Grunert, Fernández-Celemín, Wills, Storcksdieck genannt Bonsmann, & Nureeva, 2010). Drichoutis, Lazaridis, Nayga, Kapsokefalou, & Chryssochoidis (2008) suggested that this relationship is reciprocal; on the one hand, nutrition knowledge prompts the seeking of nutrition information and use of the food label, while on the other hand, this seeking and use of nutrition information contributes toward the development of nutrition knowledge. This is not a surprising relationship, given the cyclical nature of Wilson's (1997) model of information-seeking behaviour. Nutrition knowledge is just one of the many factors that have been linked to food label information use throughout an extensive body of literature that spans a range of academic disciplines, which will be discussed in the ensuing chapter.

2.4. Summary of Theoretical Framework

The theoretical framework structuring this exploration of food label information use is grounded in the information sciences – specifically in the study of information seeking behaviours. It is rooted in the idea that, in order to use food label information effectively, there must be some motivation behind the retrieval, understanding, and use of this information – manifesting within the individual as information needs that are inspired by

primary needs. As a fundamental contribution toward the current understanding and conceptualization of information seeking behaviour, this framework begins by considering Wilson's (1997) model to show the cyclical, progressive nature of information seeking behaviour in the development of personal knowledge. It is important to recognize that these behaviours do not occur in a vacuum but within a specific context, with an established body of knowledge and capacity for understanding unique to each individual. This model also shows the various forms that information seeking behaviours can assume – a reminder that this is not necessarily deliberate process, but instead consists of any behaviours leading to the satisfaction of information need.

A second model of Everyday Life Information Seeking was introduced to show that information seeking behaviours are not limited to the satisfaction of recognized gaps in knowledge, but occur daily, even constantly, as we navigate the world around us (Savolainen, 1995). Food-related decisions qualify as 'way of life' decisions that are dictated by a 'way of life' worldview - when met with a gap in nutrition knowledge, the consumer's reaction depends on this 'mastery of life' worldview. On the one hand, Savolainen's (1995) model is an important reminder that everyday decisions demand some degree of information seeking, even when it's as simple as checking the price of a food product; on the other hand, Savolainen's (1995) model is also a reminder that not all individuals have the same capacity and motivation to seek information upon encountering a gap in knowledge. While some simply ignore the gap and make a decision, others are driven to satisfy that gap before a decision can be made.

Finally, Furst et al.'s (1996) Food Choice model is the bridge that connects this theoretical foundation, based in the information sciences, to the study of food-related decision-making. Furst et al.'s (1996) model appears linear in nature, with each food choice occurring independently – however, further consideration reveals that it is a cyclical process. Just as each instance of information seeking behaviour informs future contexts, each Food Choice contributes toward the development of a specialized food-related knowledge. Additionally, the continual interplay between one's *Personal System* and context can result in the development of *Strategies* that are used to make certain *Value Negotiations* related to essential information needs more efficient. Realistically, the

Personal System is a relatively stable set of information seeking behaviours used to make food decisions, as the locating of specific information is necessary to perform any *Value Negotiations* and *Strategies*.

Another important consideration is the role of nutrition knowledge on these processes, which must be developed and refined to some degree in order to make sense of food-related information – specifically for making *Value Negotiations* related to health and nutrition. In order to develop and refine nutrition knowledge, supplementary information seeking must be pursued. A notable shortcoming of Furst et al.'s (1996) model is that it does not account for any deliberate information seeking behaviours in response to gaps in nutrition knowledge, particularly those that are discovered when making *Value Negotiations* related to any primary needs that are important to the individual – for example, those related to the presence of allergens for allergic consumers. This supplementary information seeking could be considered a strategy, or perhaps warrants amendments to Furst et al.'s (1996) model. Considering that the development of smartphone technology has greatly increased the average consumers' capacity for in-store information seeking via mobile Internet browser immediately upon encountering a gap in nutrition knowledge, a development that has occurred since Furst et al.'s (1996) model was originally introduced, there has been a fundamental shift in the information horizon of the average consumer, which may have great implications toward the future of Food Choices in general.

Having developed this theoretical framework based in essential concepts from the study of information seeking behaviour, consumers' use of ingredient information to make food purchase decisions will henceforth be considered. The ensuing chapter will consider the most relevant research dedicated to understanding consumers' use of food label information in the making of food purchase decisions.

Chapter 3

LITERATURE REVIEW

3. OVERVIEW

This chapter is dedicated to summarizing the most relevant research and findings related to the study of food label and nutrition information use. To gather this information, a semi-structured search strategy was employed in a range of databases, including several dedicated to the information sciences, health sciences, food sciences, marketing and consumer behaviour, and sociology. The literature reviewed has largely been limited to work published since 1990, marking the modernization of the food label with the introduction of the Nutrition Facts table and the regulation of certain types of food claims with the passing of the NLEA in the USA, prompting a significant amount of research to gauge the effectiveness of these changes (Cowburn & Stockley, 2005). The majority of the literature reviewed described research that has been performed in North America and Europe, though some relevant geographic outliers have also been included. The labelling practices in these regions are all consistent with the Codex labelling standards (Rayner et al., 2013), making them relatively consistent in structure and content to the mandated components of Canadian food labels.

Upon reviewing the results of these searches, it became apparent that the scholarship related to the use and understanding of nutrition information is broad and diverse, transcending several academic disciplines – truly a multi-disciplinary topic. Among the many peer-reviewed research papers, a number of reviews have been uncovered; these reviews, to varying degrees of effectiveness, have synthesized some aspect of the literature, making them valuable discoveries. Also apparent in the subjects covered by these reviews is the diverse nature of the study of food labelling, with little overlap in each review. The most valuable of these reviews—Campos et al. (2011)—contained the most recent and most comprehensive literature review related to this research particular project. Two earlier attempts to summarize the research on consumers' use and understanding of food label information were also uncovered (Cowburn & Stockley, 2005; Drichoutis et al., 2006), as

well as another dedicated to European research on the subject (Grunert & Wills, 2007). Also, Leathwood et al. (2007) reviewed the literature dedicated to the study of nutrition and health claims, while Hieke and Taylor (2012) summarized the research related to the impact of label design and features on consumer behaviours, focusing mostly on claims and alternative labelling strategies. Finally, Fernqvist & Ekelund (2014) reviewed the research exploring the role of external cues on food selections.

Having examined these reviews alongside the results generated from the semi-structured search strategy, a gap in the research became apparent. Of the three legislated components of the food label in Canada, a vast majority of research within Canada and abroad has focused on the use and understanding of either the Nutrition Facts table or claims about food products, or has examined label use broadly. The research related to consumers' perceptions, understanding, and use of food label information has focused on four general aspects (Visschers, Hartmann, Leins-Hess, Dohle, & Siegrist 2013):

1. The various psychosocial, external, and socio-demographic factors that affect the consumer's use of food label information.
2. The impact of different label formats on consumer behaviours.
3. The relationship between food label usage and dietary behaviours.
4. And the visual attention directed toward specific components of the food label, measured using via eye-tracking technology.

However, little apparent effort has been directed toward understanding **how consumers use the list of ingredients when making food purchase decisions**, despite several instances where the list of ingredients has been identified as an important component of the food label affecting consumers' purchase decisions.

One of these instances emerged from a report that detailed the findings of a Canadian study on nutrition behaviour, entitled *Tracking Nutrition Trends* (*TNT*) *VII* (Canadian Council of Food and Nutrition, 2008). The first *TNT* initiative was conducted in 1989 by the National Institute of Nutrition with the goal of measuring perceptions of fat and fiber among Canadian consumers (Canadian Council of Food and Nutrition, 2009). Over the past twenty-five years, this survey has evolved to measure many aspects of nutrition behaviour,

including the self-reporting of nutrition knowledge and nutrition information use (Canadian Council of Food and Nutrition, 2009). In 2008, *TNT VII* reported that the list of ingredients was the most used component of the food label by Canadians when using food label information to make purchase decisions (with 80% of the sample selecting the list of ingredients), followed by the 'Best before' date and the Nutrition Facts table, selected by 74% and 71% of the sample respectively (Canadian Council of Food and Nutrition, 2008). Further, another question from this *TNT VII* survey elaborated on the nature of ingredient information use, asking participants to indicate the frequency that they had looked at a food label to *see whether the food contains a specific ingredient* – to which 32% of participants responded 'Often' and 37% responded 'Sometimes', totaling 69% of the sample whose responses indicated that they use ingredient information – at least sometimes. Similarly, a large-scale American survey reported that just over half of respondents indicated using the list of ingredients 'at least sometimes' when making food purchase decisions (Ollberding et al., 2011). Finally, *TNT 2013* most recently confirmed that over half of Canadians reported either 'usually' or 'always' considering ingredient information when making purchase decisions (Canadian Foundation for Dietetic Research, 2013). In spite of these findings that suggest the prevalent use of the list of ingredients among Canadian and American consumers, there have been no apparent efforts to focus on how this information is understood or used – with most studies focusing instead on consumers' use of the Nutrition Facts table and claims, or on food label usage in general.

Having considered many studies related to food label information use, this chapter has been dedicated to summarizing three basic trends in the research that have implications on the use of ingredient information, presented as three questions that have been answered to varying degrees of satisfaction. Section 3.1 will discuss <u>who</u> has been determined the most likely to use the nutrition information on food labels. Section 3.2 will discuss <u>when</u> food label information is most likely considered, as well as when it is not considered, by consumers. Finally, Section 3.3 will discuss <u>how</u> consumers might use food label information. Answering these questions should provide the reader with a relative idea of the most significant work related to this topic, comprising the collective knowledge related to consumers' use of food label information.

3.1. WHO USES FOOD LABELS INFORMATION?

In order to determine who is most likely to use food label information, many studies have focused on different factors in the effort to determine the best predictors of food label information use. Although the measures used to determine these factors have been diverse, five general trends have been identified. The first trend has consisted of an almost overwhelming effort to predict the likelihood of food label information use based on various socio-demographic factors, while a second much smaller and related trend has been to segment consumers based on nutrition information behaviours, before analyzing the segments socio-demographic consistencies. The third and fourth trends have been to measure relative levels of nutrition knowledge and health consciousness – two important variables that have long been connected to food label information use throughout the literature. Finally, the fifth trend supersedes all other considerations, identifying motivation as the key factor determining whether or not, and to what degree, food label information is used when making food purchase decisions.

3.1.1. SOCIO-DEMOGRAPHIC FACTORS

Much of the research related to food label information use has struggled to establish who is most likely to use food label information. As a result, many aspects of food label information use and non-use have been linked to various socio-demographic factors, with varying degrees of consistency. The most consistently reported finding, with very few exceptions, has been that women overwhelming tend to be more concerned with nutrition information, reporting more frequent and elaborate use of nutrition information than men (Cowburn & Stockley, 2005; Drichoutis et al., 2006; Grunert & Wills, 2007; Campos et al., 2011) – a finding consistent among Canadian consumers (Smith et al., 2000; Goodman, Hammond, Pillo-Blocka, Glanville, & Jenkins, 2011). Another finding reported consistently throughout the literature is the positive relationship between education and food label use – specifically, those with higher levels of education tend to use more food label information (Cowburn & Stockley, 2005; Drichoutis et al., 2006; Campos et al., 2011). Again, Goodman et al. (2011) confirmed that Canadians with more education tend to access nutrition information from a variety of sources, including food labels, more than

those with less education. Though many studies have attempted to establish a link between consumer age and food label information use, these findings have varied – while Campos et al. (2011) determined that younger and middle-aged consumers were more likely to use food labels than older consumers, they also noted several exceptions. Similar to age, income is another factor that has been linked to food label information use, but this relationship is not quite as clear or consistent as the others (Drichoutis et al., 2006; Campos et al., 2011). *TNT VII* study reported that Canadian participants with a higher income were more likely to use food label information, as well as to seek nutrition information in general (Canadian Council of Food and Nutrition, 2008). Based on the various socio-demographic findings that have been confirmed through Canadian research, Goodman et al. (2011) concluded that women with a higher income and more education are the most likely to use the nutrition information from food labels.

While these socio-demographic trends are interesting to consider and to some degree useful, they are also quite limited in the ability to predict the individual's behaviour, given that many exceptions have been found (Campos et al., 2011). Hess, Visschers, and Siegrist (2011) noted that these inconsistent findings related to socio-demographic variables could be attributed to the different sets of predictor variables used in each study, while Grunert, Wills, and Fernández-Celemín (2010) noted that these socio-demographic factors are generally not causal predictors, serving instead as proxies for something else; for example, income may be linked to healthier eating and higher nutrition knowledge, but this relationship may also be attributable to access to better grocery stores, which provide healthier options and better nutrition information. A recent study employing eye-tracking technology in a simulated shopping task experiment concluded that there was little difference in the food label information viewed between socio-demographic groups, including sex, race, age, marital status, income, and education (Graham & Jeffery, 2011). For example, while the research overwhelmingly suggests that women use food label information more often than men, there are certainly men who are high-level users of food label information and women who do not ever consult the nutrition information provided on food labels. This is merely a hypothetical example to demonstrate that, logically, exceptions like these likely prevail within the most overwhelming demographic trends.

While some socio-demographic factors may appear relatively effective predictors of nutrition-related behaviours, they are generally not the most reliable predictors of nutrition information behaviour (Hollywood, Armstrong, & Durkin, 2007). There are several alternative factors to consider that are more effective predictors of behaviour, which can either transcend or complement socio-demographic factors to predict behaviour.

3.1.2. CONSUMER SEGMENTATION

An alternative approach to predicting consumer behaviour that transcends socio-demographic factors is called segmentation, where participants are categorized into groups based on their expressed or demonstrated behaviours; after establishing segments based on the criteria of interest, segments can be analyzed based on socio-demographic factors, which reduces the limitations inherent in generalizing consumer behaviour based on socio-demographic factors (Hollywood et al., 2007). Of the few notable efforts at consumer segmentation, Souiden, Abdelaziz, and Fauconnier (2013) identified three clusters of Canadian consumers, highlighting the importance of the interplay between nutrition knowledge and health consciousness on the use and understanding of food label information. Considered the ideal cluster, the *Nutrition Savvy* segment consisted of the most health conscious and knowledgeable consumers, who reported high levels of food label information use – but reportedly consisted of approximately 70% of Souiden et al.'s (2013) sample. Alternatively, the *Skeptical and Less Committed* segment reported high health consciousness but a lower commitment to nutrition, unwilling to sacrifice taste or pay more for nutrition – while capable users of food label information, they demonstrated lower nutrition knowledge and skepticism toward food label information. A third *Nutritionally Perplexed* segment demonstrated the lowest levels of nutrition knowledge and an overall lower capacity for understanding and using food label information (Souiden et al., 2013). Having tied knowledge to motivation, Souiden et al. (2013) suggested that nutrition knowledge does not necessarily translate into higher food label use unless it is motivated by health consciousness.

In a similar effort, Visschers et al. (2013) considered nutrition information use more broadly, segmenting consumers into four different types of nutrition information user from

a large sample of Swiss citizens. Similar to Souiden et al.'s (2013) *Nutrition Savvy* segment, the *Official Information Users* segment consisted of those who were the most health conscious and the most interested in nutrition information, and who demonstrated the healthiest eating behaviours – however, Visschers et al. (2013) determined only about 14% of their sample could be included in this segment, comparatively smaller than that of Souiden et al. (2013). Additionally, Visschers et al. (2013) described a *Moderate Users* segment that consisted of about 35% of the sample and an *Uninterested* segment that consisted of approximately 28% of the sample. *Moderate Users* reported relatively low nutrition information use despite reporting relatively high levels of health consciousness and interest in nutrition information, which may be attributable to lower levels of nutrition knowledge, while the *Uninterested* reported low interest in health and nutrition, and the least healthy dietary behaviour (Visschers et al., 2013). The most interesting and relevant contribution from Visschers et al. (2013) from the perspective of this study is the fourth segment, the *Internet Users*, consisting of 21% of their sample. This segment was on average the youngest and most educated segment, and was characterized by a heavy reliance on Internet sources of nutrition information, but displayed only moderate levels of health consciousness and relatively liberal dietary preferences (Visschers et al., 2013). Understanding the nutrition information behaviour of this young, intelligent, Internet-dependent segment could be a vital step in promoting nutrition education and improving the dietary behaviour of the next generation of Canadian consumers.

3.1.3. NUTRITION-RELATED KNOWLEDGE

Beyond—but perhaps related to (Parmenter, Waller, & Wardle, 2000)—formal education, more knowledge of nutrition and diet-disease relationships has been consistently linked to the use of food label information throughout the literature (Drichoutis et al., 2005; Grunert, Wills, & Fernández-Celemín, 2010; Campos et al., 2011; Hess et al., 2011; Cooke & Papadaki, 2014) – and specifically to the use of ingredient information (Bornkessel, Bröring, Omta, & Van Trijp, 2014). While the positive link between nutrition knowledge and food label information use has long been established (Guthrie, Fox, Cleveland, & Welsh, 1995; Levy & Fein, 1998), few have suggested that it has no effect on food label information use (Nayga, 2000). Blaylock et al. (1999) proposed that two distinct types of

nutrition knowledge exist; a knowledge of principles, such as the amount of fiber one should consume, and a knowledge of the nutrient content of foods – such as that milk is a good source of calcium. Those with higher levels of nutrition knowledge have been found to be more likely to use food label information related to calories, ingredients, and fat (Drichoutis et al., 2005). Nutrition knowledge was also linked to understanding healthfulness, effectively using of nutrition information, and making healthier food decisions (Miller & Cassady, 2012). Drichoutis et al. (2006) proposed that those with higher nutrition knowledge are more likely to use food label information because this higher nutrition knowledge increases the efficiency with which the label information is decoded and utilized in the purchase decision. Without the capacity to understand food label information, using food labels to make purchase decisions is much more difficult – therefore, nutrition knowledge must play a critical role in the effective use of food label information (Grunert, Wills, & Fernández-Celemín, 2010). Generally speaking, higher nutrition knowledge has been consistently linked to increased food label information use.

In general, Canadians have appeared relatively confident in their nutrition knowledge. Since nutrition knowledge was first measured in 1997, the *Tracking Nutrition Trends* survey has measured Canadians' self-reported level of nutrition knowledge (Canadian Council of Food and Nutrition, 2009); in 2013, 82% of surveyed Canadians considered themselves to be either somewhat or very knowledgeable about nutrition (Canadian Foundation for Dietetic Research, 2013). These surveys have also included some basic nutrition-related questions to verify this knowledge, finding that most respondents have had a relatively good understanding of nutrition and diet-disease relationships (Canadian Foundation for Dietetic Research, 2013). The Canadian Council of Food and Nutrition (2009) noted that people do tend to overstate their level of nutrition knowledge, but that those who express themselves as knowledgeable about nutrition do tend to be somewhat knowledgeable. As a higher level of nutrition knowledge should increase one's capacity to understand food label information, it would be logical to assume that those who understand food labels are more likely to use them. A recent Canadian study on the comprehension of food label information, those with lower income and less education, as well as older participants, had more difficulty completing the assigned label-

related tasks, correlating with the various demographic trends identified earlier (Sinclair, Hammond, & Goodman, 2013). However, it is important to acknowledge that nutrition knowledge is not enough to affect food behaviour – the individual must also be motivated to use food label information (Blaylock et al., 1999).

3.1.4. HEALTH MOTIVATION

Inextricably linked to various contextual factors discussed in the Theoretical Framework (see Section 2.1), consumers motivated by health-related factors have generally been found more likely to use food label information than those motivated by other factors. Nutrition information can only affect eating behaviour to the degree that the consumer is motivated to use it when making a purchase decision (Grunert & Wills, 2007). Grunert, Wills, and Fernández-Celemín (2010) found that participants were much more likely to use food label information when motivated by healthiness. Grunert, Fernández-Celemín, Wills, Storcksdieck genannt Bonsmann, and Nureeva (2010) determined that most consumers are capable using basic information related to calories and key nutrients effectively, but that the key factor limiting food label information use is the motivation to use it. Guthrie et al. (1995) identified a strong relationship between individual interests in nutrition information and paying attention to food labels information, a relationship confirmed in a recent consumer segmentation study that found those who were most interested in nutrition information ate healthier than the other identified segments (Visschers et al., 2013). Motivation plays an essential role in the seeking of nutrition information, particularly when locating food label information that is more difficult to find (Visschers et al., 2010). Those motivated by healthiness were found to look significantly longer and more frequently at food label information than those motivated by taste (Visschers et al., 2010). Whether an individual is independently motivated to achieve healthiness or is prescribed a diet for health-related reasons, those who aspire toward healthier eating habits generally report greater use of food label information (Drichoutis et al., 2005; Ollberding et al., 2011; Campos et al., 2011; Graham & Laska, 2012). Further, health motivation has been identified as one of the most important determinants of ingredient awareness, as those with established dietary concerns are motivated to learn and retain nutrition information related food contents to appease whatever dietary concerns are most prominent (Bornkessel et al.,

2014). One may be inspired by any number of health motivations—for example, knowledge of diet-disease relationships—that have prompted the voluntarily adoption of certain dietary practices that warrant food label information use, while many others are afflicted by health concerns with immediate consequences, such as chronic illnesses or allergies (Campos et al., 2011).

Chronic illnesses are not expected to be a significant factor in this study, given its focus on young population of university students (see Section 4.2). However, those with allergies, intolerances, or sensitivities to certain types of foods and food contents can trigger physical reactions of discomfort or illness upon consuming a pre-packaged food that contains a trigger, which increases the stress associated with food choices and negatively affects their quality of life (Barnett et al., 2013). Consumers with allergies and hypersensitivities have been found to have higher levels of modern health-related worries, such as those related to additives in food, cross-contamination, and genetically modified ingredients (Lind et al., 2005; Devcich, Pedersen, & Petrie, 2007). Given this increased level stress, it is no wonder that Barnett et al. (2011a) found that allergic consumers engage in more intensive information-seeking behaviours related to food purchase decisions. Regardless of the health-related factors affecting the individual, all consumers are affected to some degree by a variable that has long been linked to food label information use – health consciousness.

3.1.5. Health Consciousness

Defined as "the awareness of the healthiness of one's diet and lifestyle" (Visschers et al., 2013), the health conscious consumer has generally been considered more likely to use food label information throughout the literature (Campos et al., 2011; Pohlmeier et al., 2012; Hess et al., 2011; Souiden et al., 2013; Visschers et al., 2013). More specifically, Visschers et al. (2013) found a strong correlation between health consciousness and interest in nutrition information, as those who are health conscious tend to be aware of the importance of diet in health. Whereas health motivation describes more so the drive to make diet-related choices based on health-related factors, health consciousness describes the recognition of a direct relationship between the individual's diet-related decisions and

personal health (Visschers et al., 2013). Mai & Hoffman (2012) found health conscious consumers were more likely to consider a number of health-related food properties during food purchase decisions, while those who are not health conscious relying on as little as a single attribute unrelated to health. Kraft and Goodell (1993) constructed an early measure of health consciousness called the Wellness Scale, defining wellness as a set of activities, interests, and opinions related to one's personal health. In this definition it is possible to see that both health motivation and nutrition knowledge both have a direct impact on the individual's conception of wellness, resulting in various degrees of health consciousness. Awareness of the healthiness of one's diet and lifestyle is dependent on one's knowledge of nutrition and its relationship with health, as well as the personal motivations driving the desire to be healthy.

3.2. WHEN DO CONSUMERS USE FOOD LABEL INFORMATION?

While a great deal of the research related to this topic has been focused on identifying who uses food label information, another trend in the research has been to determine when food label information is used. The reliance on retrospective, self-reported behaviours in the study of nutrition behaviour—discussed in the Review of Methodologies section of the next Chapter (see Section 4.1)—is generally thought to have resulted in some degree of over-reported food label use from consumers, as several studies that employed objective measures noted significantly lower food label use than most self-reported figures (Balasubramanian & Cole, 2002; Higginson et al., 2002; Grunert, Wills, & Fernández-Celemín, 2010; Graham & Jeffery, 2011). Therefore, it has become important to identify when the food label is used and equally important to consider when the food label is not used, as it has become clear, for many, that the likelihood of food label information use may also be dependent on several circumstantial factors. Higginson et al. (2002) identified three general circumstances in which food label information is most likely used: 1) when purchasing a new product for the first time, 2) when deciding between two similar products, and 3) when trying to determine the relative healthiness of a particular product. It should be noted that there is a significant degree of overlap between these three trends identified in the research; consider that one of these three circumstances identified by

Higginson et al. (2002) in which the use of food label information is most likely is also one of the most essential ways how food label information is used—considered in the next section of this chapter—while the third instance mentioned by Higginson et al. (2002) overlaps with several of the predictor variables identified in the previous section. Having reflected on this consideration of when food label information is considered, it has become apparent that food label information is either habitually not used, circumstantial, or constant – mandated by some health-related consideration, like an allergy. In all circumstances, when food label information is used depends on the many variables discussed throughout the Theoretical Framework presented in Chapter 2 (see Sections 2.2 & 2.3).

First, habitual non-use demands consideration. In addition to a lack of interest in healthy eating and nutrition information (Sharf, Sela, Zentner, Shoob, Shai, & Stein-Zamir, 2012), consumers may not use food label information because they may believe that they do not need any more information about food, they may not understand food label information or how to use it, or they may have priorities perceived to be more important than healthy eating (Gorton, Ni Mhurchu, Chen, & Dixon, 2009). Rasberry Chaney, Housman, Misra, and Miller (2007) reported that the three most common reasons given by college students for not using food label information were the desire to buy foods regardless of nutritional attributes, time constraints, and simply not caring enough. As the Nutrition Facts table utilizes numbers to express volume, mass, and percentages, while other components of the food label can utilize scientific language, lower numeracy and literacy skills may also negatively affect consumers' use food label information (Rothman et al., 2006). On the other end of the spectrum, Hess et al. (2011) proposed that some consumers with high levels of nutrition knowledge do not need to look at food label information because they already have a strong understanding of the content of the food, which may be particularly relevant for those who are health conscious to the extent that they do not buy any unhealthy products. Also, Rayner, Boaz, and Higginson (2001) suggested that habitual food purchasing could render the use of food label information redundant. There are many reasons not to look at nutrition information, but the remainder of this study will concern the actual use of food label information – which has been

measured using a variety of quantitative and qualitative methodologies. It is apparent that, for non-use to be habitual, there must be an extreme lack of motivation or knowledge – otherwise, food label use must be a circumstantial occurrence that depends on any number of circumstantial and contextual factors (see Section 2.2).

Another situational factor that can affect the extent that food label information will be used is the time available to shop – if the consumer is rushed, there may very well be no food label information use (Nayga, Lipinski, & Savur, 1998). According to Drichoutis et al. (2005) the most significant cost of using food label information consists of the time spent processing that information – depending on the lifestyle of the consumer or the contextual parameters of a single food choice, the perceived cost of spending any time considering food label information may trump any nutrition-related considerations, especially if the consumer is not particularly health conscious. Upon considering the increased time it could take a consumer with a lower level of nutrition knowledge to process food label information, especially if the benefit derived from that use is marginalized by a reduced understanding of the food label information, it is not surprising that those with lower levels of nutrition knowledge are less likely to use the food label (Drichoutis et al., 2005). In such circumstances, the application of Stigler's (1961) Economic Model of Information Search is particularly relevant. According to Furst et al.'s (1996) Food Choice model, time restrictions would be considered a contextual factor that impacts each food choice experience; depending on one's lifestyle, food choices could constantly be influenced by time restrictions, such as for parents with young children, or this affect could be more variable, dependent instead on the schedule of a given day.

Motivation is an important consideration that can vary depending on circumstance. When consumers are motivated by priorities other than healthiness, even if they are health conscious most of the time, they may very well abstain entirely from the use of food label information (Hess et al., 2011), confirmed through an eye-tracking study performed by Visschers et al. (2010), which demonstrated that participants motivated by taste took less time and considered less nutrition information than those motivated by healthiness. Further, Drichoutis et al. (2005) found that the importance attributed to price and taste has a negative relationship with the frequency of food label information use. Hess et al. (2011)

found that participants who perceived eating as a source of pleasure were less likely to use food label information, especially if this pleasure was derived from eating unhealthy foods – as considering the negative properties of this food could reduce the pleasure associated with its consumption. When motivated by hedonic satisfaction, consumers have been found less likely to consider food label information (Wahlich, Gardner, & McGowan, 2013); for example, a consumer may be willing to spend time determining which cereal option is healthier, but may not exert the same energy when deciding which cheesecake to purchase (Balasubramanian & Cole, 2002). Closely tied to motivation, the type of food under consideration may also affect the nature of food label information use in a given circumstance.

Several studies have suggested that the nature of food label information use may depend on the type of food under consideration, as well as if the food label is used at all (Higginson et al., 2002). For example, Graham and Jeffery (2012) found that consumers were more likely to look at food label information for complex foods like a pre-packaged soup or pizza; meanwhile, Grunert, Fernández-Celemín, Wills, Storcksdieck genannt Bonsmann, and Nureeva (2010) found that participants were most likely to look at nutrition information on breakfast cereals and yoghurts. According to Graham & Jeffery (2011), consumers are more likely to examine the food label information of ambiguous foods, where the level of healthiness is not clear, than foods that are obviously healthy or unhealthy, while Grunert, Wills, and Fernández-Celemín (2010) proposed that the food label information of healthy products is more likely to be considered than that of unhealthy products. Interestingly, Burton and Andrews (1996) noted that the modern food label is more useful for determining if a product is unhealthy rather than healthy, given the nature of the mandated information – implying that, even when considering two healthy products, it is easier to determine which of these options is less healthy.

Finally, some consumers are bound to certain contextual factors that motivate the use of nutrition information in all circumstances. These highly motivated individuals could either be bound by the physical consequences of a food choice, specifically an intense allergy or sensitivity, or by the emotional/moral consequences of a food choice, such as a devote vegan, religious, or health-conscious person. For an allergic individual, the effective

use of food label information is critical to avoid allergens, though the possibility of cross-contamination or accidental consumption can only be minimized through constant vigilance (Barnett et al., 2013). The labelling of food allergens in Canada has improved in recent years, yet allergic consumers are still faced with a labelling system that can fail to meet their information needs; labelling regulations still allow for certain ingredients to be identified collectively—for example, a spice mixture may not indicate that it contains soy or wheat—and the labelling of the possible cross-contamination is still only voluntary (Sheth et al., 2010). As such, accidental exposure to allergens can occur in several ways – the allergic consumer does not notice the allergen listed in the list of ingredients; the allergen is not listed in plain language; the allergen is listed, but the list of ingredients is illegible; the allergen is part of a collective ingredient, like a spice mixture; an error in translation leads to an allergen not being listed; or an allergen may be present via cross-contamination (Sheth et al., 2010).

Whereas situational factors can affect isolated food choices, contextual factors can systematically affect purchase decisions – consider the several situational and contextual factors identified by Furst et al. (1996), which reminded the reader that interplay between any of these may factors may occur for any given food choice. Some interesting situational factors identified by Furst et al. (1996) that may disrupt usual nutrition behaviours include the traditions inherent certain social and cultural events – think of the standard Canadian birthday party, or the Christmas holiday, in which sweets and treats are expected. Full participation in these occasions may include the pressure, whether externally or internally sourced, to consume food without adhering to one's *Personal System* (Furst et al., 1996) – however, Furst et al. (1996) does not allot much attention to these exceptions, which may warrant modifying their model. Having found evidence that confirms this sort of exception, Wahlich et al. (2013) reported that consumers who are determined to eat for pleasure are generally less concerned with nutrition information, at least in that instance.

3.3. HOW DO CONSUMERS USE FOOD LABEL INFORMATION?

As can be seen in the previous section, a great deal of effort has been directed toward identifying which consumers use food label information and with what frequency it is used – however, it is equally important to consider **how** food label information is used to help make food purchase decisions. In this latter form of use, consumers may self-impose regulations based on their comprehension of healthfulness, or they may be prescribed by a health professional for health-related concerns – such as to counter chronic illness or to avoid allergic reactions. Wahlich et al. (2013) identified six themes related to how, when, and why consumers use food label information, three of which concerned how the label can be used: the first, consumers can use food label information to simply understand some aspect of a food that they are considering; second, consumers may rely on food label information to serve as regulatory mechanism that dictates whether or not a food product can be consumed; and third, consumers weigh competing point-of-purchase influences.

Logically, a food label can be considered in three ways: 1) the information from a single label can be considered exclusively, 2) the information from several labels can be compared and contrasted, and 3) the information from a label can be ignored. However, the nature of the modern food label encourages comparison between products by consistently providing information related to the most essential food attributes, giving consumers the ability to efficiently evaluate these attributes at the point of purchase (Visschers et al., 2013). Miller and Cassady (2012) explored two types of food label information use, noncompensatory versus compensatory strategies. The first, noncompensatory strategies, consist of comparing single food attributes across several labels, such as comparing total sugar in product A versus product B; the second, compensatory strategies, consist of considering more than one attribute from a single food simultaneously, with one attribute compensating for another, and then comparing this combined estimation with either a single attribute of another food, or several (Johnson, 1990). Miller and Cassady (2012) found that those with specific dietary goals increased their use of noncompensatory strategies, often driven by the avoidance of negative attributes, and that noncompensatory strategies could increase decision-making efficiency. While Miller and Cassady (2012)

found that noncompensatory strategies were easier to implement than compensatory strategies, Misra (2007) reported that approximately one-third of her sample of university students had difficulty performing 'complex' label-related tasks, like comparisons between labels. Balasubramanian and Cole (2002) hypothesized that the nature of the modern label that features claims that often focus on the product containing less of an negative attribute and a Nutrition Facts table that lists nutrient content in a format that facilitates comparison, encouraging the consumer to focus on the minimization of negative food attributes.

While consumers' perceptions of a particular food attribute must depend on the context of the individual (see Section 2.1), certain attributes tend to be perceived either negatively or positively. According to reviews by Grunert and Wills (2007) and Campos et al. (2011), fat and calories have been consistently identified as the most commonly sought nutrient information from food labels, while other concerns included sugars, salt, and carbohydrates, as well as protein, vitamins, and calcium. Noting that the latter three nutrients are generally perceived to be positive, the rest are generally perceived to be negative nutrients that one should limit the intake of when possible. This tendency for consumers to focus on information related to the negative attributes of food over its positive attributes has been recognized in a number of studies (Worsley, 1996; Shine, O'Reilly, & O'Sullivan, 1997; Burton, Garretson, & Velliquette, 1999; Garretson & Burton, 2000; Balasubramanian & Cole, 2002; Mohr, Lichtenstein, & Janiszewski, 2012). While much of this research has tended to focus on the Nutrition Facts table, there have been several indications that this tendency extends to the list of ingredients. Grunert and Wills (2007) note that several studies have found that participants direct varying degrees of attention toward additives, 'artificial' ingredients, E-number ingredients, and sweeteners. Buchler, Smith, and Lawrence (2010) conducted a study on consumers' perceptions of various food risks, finding a general preference for foods without additives, artificial ingredients, pesticides and other chemicals, preservatives, artificial colouring, and hormones or antibiotics in meat.

Consumers might express the abstract preference to avoid these various food elements, but the ability to identify and avoid these elements demands the effective and accurate use of food label information, which requires a certain degree of nutrition

knowledge. Walters and Long (2012) focused on consumers' processing of intrinsic and extrinsic cues, where intrinsic cues consist of product-related attributes that cannot be altered without modifying the contents of the product, such as the ingredients or the nutrient content of the food, while extrinsic cues consist of the more subjective information that is other than, though related to, the physical properties of the food, such as nutrient content claims in which nutrition information is essentially interpreted for the consumer. Those with lower levels of nutrition knowledge tend to rely on extrinsic cues, which are easier to process but generally only highlight a single deliberate aspect of the product, whereas intrinsic cues require a certain level of nutrition knowledge to accurately interpret (Walters & Long, 2012). A review of the nature of nutritional marketing on Canadian food labels revealed that a significant proportion of the extrinsic cues had focused on a single aspect of the food such as fat, which could reduce consumers' attention to other negative aspects of the product that are equally negative, or more so (Schermel, Emrich, Arcand, Wong, & L'Abbé, 2013). Therefore, higher levels of nutrition knowledge could reduce the consumers' dependency on extrinsic cues and enable the use of intrinsic cues, which should result in an enhanced ability to make better food-related decisions.

Purchase intention may also affect the degree that food label information is considered. Graham and Jeffery (2011) originally hypothesized that consumers would consider information from the food labels of products that they determine to purchase more extensively than those they do not purchase, based on the logic that each purchase decision consists of the consideration of many factors, with each factor either meeting the demands of the consumer or warranting ruling out the purchase of the product; whereas a rejected product could be rejected at any point, a purchased product will have satisfied all the most essential demands of the consumer. While Graham and Jeffery (2011) did not mention Furst et al.'s (1996) model in their study, the hypothesis is consistent with the model and resonates with the theoretical framework of this project. However, though logically sound, Graham and Jeffery's (2011) hypothesis is difficult to measure because, unlike the theory, consumers' use of food label information is not bound by logic, nor is it always applied systematically. For Graham and Jeffery's (2011) hypothesis to be validated, consumers would have to consider whatever factors they are concerned with

from most important to least important, as some consumers only rely on a few select pieces of important information to make food decisions (Scheibehenne et al., 2007). In some cases, it may be a single qualifying factor that determines whether or not a food will be consumed, such as the presence of an allergen for allergic consumers, and depending on when the information concerning the qualifying factor is discovered, a corresponding amount of food label analysis may ensue (Scheibehenne et al., 2007). The hypothesis also assumes that food label information is used – all the while many justifications for not using food label information have been discovered.

3.4. Summary of Literature Review

Having reviewed a significant body of research related to food label information use, it has become clear that this subject that has been approached from a variety of academic perspectives that have employed a wide variety of measures and methodologies to explore this complex aspect of consumer behaviour. Given this variability in perspectives and measures, the current understanding of consumers' use of food label information is far from complete. Three broad trends in the research have been identified in the research: the first relates to who uses the food label, focused on the prediction of food label information use; the second relates to when the food label is used, as well as when it is not used; and the third relates to how food label information is used by consumers – which is apparently the least developed of the three.

Section 3.1 has discussed the various factors that have been considered predictors of food label use. From a socio-demographic standpoint, women with higher income and more education are generally considered to be most likely to use food label information (Campos et al., 2011; Goodman et al., 2011). However, given several exceptions to these findings, some have concluded that socio-demographic factors are not the most effective predictor of food label information use. To counter the weakness inherent in socio-demographic generalizations, a few efforts have been made to segment consumers based on behaviour and then analyze those segments for socio-demographic trends with some success (Souiden et al., 2013; Visschers et al., 2013). These efforts at segmentation are

interesting because they demonstrate that another set of predictors of food label information use—health consciousness and nutrition knowledge—can be used to strengthen the implications drawn from socio-demographic findings. While nutrition knowledge and health consciousness have been linked to food label information use throughout the literature, a high level of either factor may not result in food label information use unless the consumer is motivated to process the provided information. Health motivation is generally considered to be the most influential motivator that results in increased levels of food label information use.

Section 3.2 has considered when consumers use food label information, which began by identifying the reasons for not using food label information at all. The reality is that, for many, food label information use appears to be dependent on a complex combination of contextual and circumstantial factors. For some, food label information is never considered; for others, food label information must always be considered; for the rest, the consideration of food label information depends on any number of factors affecting the individual at a given moment – best represented conceptually by Furst et al. (1996) and discussed as part of the Theoretical Framework (see Section 2.2). For the most part, non-use appears to be attributable to a lack of capacity or motivation to process the information provided on the food label, with motivation being the essential factor determining whether or not food label information will be considered. Certain contextual factors, such as the prospect of an allergic reaction or an unwavering devotion to the maximization of healthiness, may mandate the use of nutrition information in all circumstances, although confidence through prior experience with a product may warrant non-use. Finally, for the average consumer, any number of circumstantial factors might affect an individual food choice, such as time limitations on a shopping session or the type of food under consideration.

Finally, Section 3.3 considers how consumers use food label information. Wahlich et al. (2013) identified three essential ways that the consumer can use food label information: the first, to understand some aspect of the food; second, to serve as a regulatory mechanism to determine whether or not a food should/can be consumed; and third, to weigh competing factors at the point of purchase. Logically, a food label can only be perceived by itself, in comparison with another, or not at all. In any case, consumers tend to focus on the negative

elements of food. This could be attributable to the nature of the modern food label, which encourages comparison through the standardized provision of certain types of information and tends to provide extrinsic cues that tend to highlight having lower amounts of negative attributes. How the food label is used also depends on the consumers' interpretation of information, which varies depending on the contextual factors (such as nutrition knowledge) informing the individual – however, most attributes are generally perceived as either positive or negative in nature by the average consumer.

The ensuing chapter will first consider the various methodologies that have been employed in the study of food label information use, considering their strengths and weaknesses, before justifying and describing the protocol employed in this particular study on the use of ingredient information in the food choice process.

Chapter 4

METHODOLOGY

4. OVERVIEW

As mentioned in the preceding chapter, the multi-disciplinary nature of this topic has prompted scholars from many academic disciplines to examine food label information use from a variety of perspectives, employing a wide variety of measures and methodologies in the process. This chapter will begin with a brief review of the various methodologies that have been used to study the use of food label information in the food choice process. The difficulties with studying this complex problem led to the design of a mixed-method approach. The targeted population and recruitment protocol will then be described. A description of the various instruments used to collect the quantitative and qualitative data informing this study will be followed by a thorough description of the protocol employed to collect this data. Finally, a description of the data analysis strategy has been provided, including the various measures that were incorporated to validate the applied methods and ensure their reliability.

4.1. REVIEW OF METHODOLOGIES

Throughout the research related to the topic, a wide variety of single- and mixed-method approaches have been developed to explore some aspect of the relationship between the consumer and the food label. A significant proportion of this research has focused on aspects of food label use that can be quantitatively measured, such as who uses the food label and when. Lioutas (2014) notes that the dominance of quantitative research has made it hard to explore how consumers understand and use food label information. Much of this quantitative research has consisted of population surveys (Campos et al., 2011), collecting retrospective, self-reported data related to past behaviours (Grunert, Wills, and Fernández-Celemín, 2010). These measures often utilize unquantified descriptors like ‘sometimes’ or ‘often’ that are left up to the interpretation of the participant

(Millen & Vernarelli, 2008), encouraging generalized estimations of past behaviour that, combined with the general tendency to remember oneself favourably, called social desirability bias (Cooke & Papadaki, 2014), is suspected to have led to some degree of over-reported usage of the food label. Many studies measuring self-reported use of the food label, including one of the studies that inspired this particular research project (Canadian Council of Food and Nutrition, 2008), have reported significantly higher use than several studies that have employed more objective quantitative measures, like in-store observation[1] and eye-tracking technologies (Balasubramanian & Cole, 2002; Grunert, Wills, & Fernández-Celemín, 2010; Graham & Jeffery, 2011). Grunert, Wills, and Fernández-Celemín (2010) estimated that self-reported food label use was over-reported by approximately 50% – implying that half of those who report using the food label 'often' may actually only use it 'sometimes'. Alternative quantitative measures have yielded interesting results and have potential to contribute toward the understanding of certain aspects of food label information use, such as who uses food label information and when it is used, they are all limited in the ability to measure the individual-level experience (Wahlich et al., 2013). As the use of food label information when making a food choice is an individual experience that relies heavily on the understanding of nutrition information (see Section 2.3), exploring how the consumer uses food label information requires access to that individual-level experience.

Therefore, to measure how consumers use ingredient information, the most effective strategy would be to implement a mixed-methods approach with complimentary quantitative and qualitative measurements so as to obtain a comprehensive measure of the consumer perspective (Stewart et al., 2008). This will allow for the sampled population to be contextualized within the greater body of quantitative findings, all the while exploring a currently under-researched aspect of food label information use. Pope and Mays (1995) noted that qualitative measures are essential in the exploration of under-researched phenomena, allowing the researcher to gain insight into individual experiences that can be

[1] In-store observation employed in the study of food label information use has tended to simply measure if a participant uses the food label and for how long it is examined, which would qualify as quantitative measures (Balasubramanian & Cole, 2002), which are sometimes combined with qualitative measures in mixed-method approaches (Grunert, Wills, & Fernández-Celemín, 2010).

quantified in larger populations through future research. Additionally, as the decision-making process is an internal, cognitive process that is not naturally vocalized (Variyam, 2008), it could not be measured without incorporating some sort of conversational aspect to allow for the participant to reveal not only what information is being considered, but why that information is being considered, how it is understood, and how this understanding effects the consumers' purchase decision.

Having established that some qualitative method was integral to the effective exploration of how consumers use the list of ingredients when making food choices, the next step was to determine which qualitative methodology would explore this phenomenon most effectively by considering the various qualitative methods that had been employed in the study of food label information use in the past. Given the nature of the phenomenon, which contains both the internal, cognitive aspects of the decision-making process and the behavioural aspects of the actual food choice, it was important to employ a methodology that could examine both aspects of the phenomenon. Of the four types of qualitative methodology that have been employed in the study of food label information use—interviews, focus groups, simulated shopping tasks, and accompanied shopping sessions—only the latter two methodologies could effectively measure both the internal cognitive aspects and the behavioural aspects of the food choice process simultaneously.

Perhaps the qualitative method with the potential to measure the most natural use of ingredient information within the food choice process is the accompanied shopping session, despite having only been incorporated into a few label-related studies (Rayner et al., 2001; Higginson et al., 2002; Barnett et al., 2013). This methodology, called verbal protocol analysis or 'think aloud' protocol, consists of a researcher accompanying participants on an actual shopping session in a supermarket where the participant has been instructed to verbalize all thoughts related to the experience and researcher prompts this verbalization upon lulls from the participant (Rayner et al., 2001; Higginson et al., 2002; Barnett et al., 2013). This methodology can be traced to the work of Ericsson and Simon (1980), who first proposed that verbal reports constitute data. These verbalized thoughts are audio recorded by the accompanying researcher and, upon lulls in verbalization, the researcher prompts the participant with simple, neutral questions to encourage the participant to reveal

the thoughts, considerations, and perceptions about the food label information, providing insight into the decision-making process with minimal influence (Rayner et al., 2001). The two earlier studies employing verbal protocol analysis had participants complete two separate shopping sessions; the first simply asked participants to shop as they would otherwise, while the second had participants shop for the healthiest product option of several pre-determined food categories (Rayner et al., 2001; Higginson et al., 2001). Prompting participants to select the healthiest product was intended to encourage food label use, as participants were unaware that the study concerned the use of food label information; in both instances participants used the food label more often during the second shopping session, reinforcing the importance of healthiness as a motivator behind food label use (see Section 3.1). Verbal protocol analysis appears to be the methodology with the most potential to provide insight into how the list of ingredients is used naturally in the decision-making process, despite only having been employed in a few label-related studies.

An alternative methodology with the potential to examine both the cognitive and behavioural aspects of the food choice process is the simulated shopping task, which has some similarities to the accompanied shopping task but offers more control over the shopping situation (Barnett et al., 2013). The simulated shopping task involves presenting participants with actual or simulated food labels, and asking them to complete certain tasks related to food choices (Burton et al., 1999; Balasubramanian & Cole, 2002; Mohr et al. 2012; Walters & Long, 2012; Barnett et al., 2013). One of the important advantages of this methodology is the possibility to utilize products that exhibit certain variables to measure the importance of those variables in the food choice process – for example, researchers examining the food label use of consumers with nut allergies were able to select several products that embodied various dilemmas for that type of consumer (Barnett et al., 2013). Some studies employing a simulated shopping task have relied on digital simulated labels in order to manipulate content (Walters & Long, 2012); however, presenting the food label in any form other than that which it would otherwise be encountered inevitably effects the consumers' interaction with the information, and therefore should be avoided if possible (Graham and Jeffery, 2011). Given that the simulated shopping task would be hosted in an environment other than that in which the food label would naturally be encountered—

which inevitably affects the consumers' experience with the information (Wahlich et al., 2013)—the experience should be rendered as natural as possible by using the food labels of real products.

Given the increased level of control over the shopping experience, the simulated shopping task has been incorporated into this particular research product. It has the potential to examine both the cognitive and behavioural aspects of the food choice process, which is the most important consideration. In addition to presenting participants with real food products, this method has also allowed the researcher to select food products exhibiting a variety of ingredient-related variables that have the potential to affect the food choice process (see Section 4.3.3). Given the nature of the protocol that was conceptualized to (see Section 4.4.3), organizing the various tasks into a funneling strategy intended to progressively encourage ingredient information use without directly referring to it, in an effort to measure its natural use (Burton et al., 1999), the level of control offered through the simulated shopping task was attractive in its potential to increase the efficiency of the study. As opposed to the accompanied shopping session studies that incorporated two separate shopping sessions in order to measure the difference between a normal session and one motivated by the selection of healthiest products, the simulated shopping task could render the process more efficient, incorporating multiple tasks within a single session. If a similar protocol were attempted through an accompanied shopping session, participants would have to be followed all throughout the supermarket as each product is revisited several times, complicating its execution.

In order to obtain a comprehensive perspective of the consumer experience, a mixed-method strategy employing complimentary quantitative and qualitative measures was designed (Stewart et al., 2008), manifesting as Phase 1 and Phase 2 of the study that will be described throughout the remainder of this chapter. Phase 1 consisted of a survey developed to quantitatively measure the self-reported use of food label and ingredient information (see Section 4.3.1), effectively contextualizing the sampled population within the established body of research, as well as exploring some general perceptions and uses of the list of ingredients among the sampled population. One benefit of first employing a quantitative method to measure self-reported behaviour was the prospect of identifying

participants who were most likely to exhibit specific behaviour—namely, frequent food label and ingredient information use—by applying a Screening Tool to the quantitative results of those who were interested in completing Phase 2 of the study (see Section 4.3.2). Finally, a qualitative method capable of examining both the cognitive and behavioural aspects of the food choice process was developed, which had the potential to provide rich insight into the understanding and use of ingredient information within the decision-making process (see Section 4.3.3). Given that the use of ingredient information in the food choice process is currently an under-researched aspect of food label information use, this qualitative method has the potential to provide insight into this use that can be confirmed through future research (Pope & Mays, 1995). In addition, the complementary nature of the two methodologies, connected through the application of the Screening Tool (see Appendix C), has enabled the researcher to validate the self-reported behaviour with the actual behaviour of Phase 2 participants, increasing the validity of the measures and findings. Through this mixed-method approach, the research questions laid out in Section 1.2 will be informed, furthering the general understanding of **how do consumers use ingredient information when making food purchase decisions?**

4.2. POPULATION & RECRUITMENT

Participants were recruited using a convenience sampling method that targeted students enrolled at Dalhousie University, a public research university located in Nova Scotia, Canada, with a student population of approximately 18,500 students spread across three campuses in the city of Halifax, as well as an Agricultural Campus located in Bible Hill, outside of Truro ("About Dal's communities," n.d.). Participation was limited to Dalhousie University students, establishing a cohort with relatively stable socio-economic parameters; with some degree variability, subjects in this population would be younger (< 30), with some level of post-secondary education, and at least enough income to afford this post-secondary education. Much of the research conducted on students have focused on the population of a single college or university (Smith et al., 2000; Davy, Benes, & Driskell, 2006; Rasberry et al., 2007; Driskell, Shake, & Detter, 2008; Pohlmeier et al., 2012), or limited to a small number of institutions within a finite geographic area (Graham & Laska,

2012; Misra, 2007), while some sampled much more geographically distributed populations (Cooke & Papadaki, 2014). Complementing the geographic practicality of focusing on Dalhousie University students, there were several additional factors motivated by past findings that have connected socio-demographic findings to food label information use, including higher levels of education and income (see Section 3.1.1).

Given the importance of these formative years of early adulthood on the development of lifelong habits and behaviours, experienced by many young adults through the perceptual lens of the university student experience, several studies have focused on the nutrition behaviours university student populations (Smith et al., 2000; Rasberry et al., 2007; Graham & Laska, 2012; Cooke & Papadaki, 2014). During these early formative years, many young adults progressively make the shift toward a more independent lifestyle (Smith et al., 2000) – of course, a broad spectrum of experience with living independently was expected, given that approximately one-third of the sample indicated being in the process of completing a graduate degree or higher. Of the approximately 18,500 students enrolled at Dalhousie University, 56% are from provinces other than Nova Scotia and 14% are international students, suggesting that at least 70% of the student population are living away from home ("Dal at a glance," n.d.), such as in university residences, shared housing accommodations, or rented apartments. For many students, this could be the first time that they are responsible for their own dietary behaviours (Graham & Laska, 2012; Cooke & Papadaki, 2014). As higher education has been linked to an increased likelihood of food label information use (Campos et al., 2011; Goodman et al., 2011), a post-secondary student population is a good place to draw a sample with subjects that will exhibit frequent food label information use. Based on the past research on students' seeking and use of food label information (Smith et al., 2000; Rasberry et al., 2007; Graham & Laska, 2012; Cooke & Papadaki, 2014), a segment of this sampled population was expected to consist of frequent label users who rely on the list of ingredients to help make food purchase decisions in the supermarket.

A convenience sample of 518 participants completed the Nutrition Information Use Survey over a two-week period, beginning on February 24, 2015, at 13:00 and ending on March 10, 2015, at 13:00. The survey was designed, created, and delivered using Opinio

software, desirable because it hosts the collected data on servers owned by Dalhousie University, located on campus. Several recruitment tools were implemented to recruit a large and broad sample from within the targeted population to complete Phase 1 of the study. An extensive list of contacts who were involved with Dalhousie student groups and societies was sent the Survey Recruitment E-mail Message (see Appendix D), which asked these contacts to forward a recruitment message that advertised the Nutrition Information Use Survey to any Dalhousie students in their communication networks. Also, a Facebook Recruitment Post was posted on the 'wall' of several popular Facebook groups used by various groups of Dalhousie students (see Appendix E), while a Bulletin Recruitment Poster was placed strategically on bulletin boards in areas of heavy traffic across Dalhousie's Halifax campuses (see Appendix F). The Bulletin Recruitment Poster incorporated detachable tabs with the full URL of the NIU Survey, which could be taken by passing Dalhousie students that were interested in completing the survey, but not at that moment. For an exhaustive list of these contacts, Facebook walls, and bulletin boards, see Appendix G – Recruitment Details.

All survey recruitment tools declared that participants who complete the Nutrition Information Use Survey could enter into an Incentive Prize Draw for one of two $100 gift cards to either Pete's Frootique or Atlantic Superstore. To enter the draw, those who completed the Nutrition Information Use Survey could click a hyperlink embedded within the *'Thank you'* message at the end of the survey (see Appendix A), which linked to a second and separate Opinio survey that was used to collect contact e-mails of all Phase 1 participants interested in entering the Incentive Prize Draw (see Appendix H). The Incentive Prize Draw survey incorporated a script that made it accessible only via hyperlink embedded in the *'Thank you'* message – rendering it impossible to access by directly by inputting its URL. Therefore, it was impossible for an individual to enter the prize draw without first completing the survey – or at least providing some response to each survey question. While there can be no guarantee that the survey was completed by Dalhousie students exclusively, the recruitment tools (see Appendix D, E, & F) and the introduction to the survey specified that this study was for Dalhousie students exclusively (see Appendix A), while the recruitment efforts were focused on resources that would most directly target

Dalhousie students. A total of 69 surveys was initiated by participants but remained incomplete at the end of the two-week period – these surveys are excluded from the data set and were not included in the aforementioned total of 518 completed surveys.

The Nutrition Information Use Survey also served to recruit participants for Phase 2 of the study. Those who completed the survey were given an opportunity at the end of the survey to express an interest in completing Phase 2 by providing a contact e-mail address that could be used to arrange the completion of Phase 2 (see Question 33 & 33a, Appendix A). Of the 518 participants that completed the survey, 197 expressed an interest in completing Phase 2. The survey responses of these 197 participants were subjected to the Screening Tool (see Appendix C), which was used to generate a maximum possible score of 96 points based on responses to 10 survey questions related to food label and ingredient information use. Of the 197 participants who expressed an interest in completing Phase 2, a total of 22 received Screening Tool scores of at least 88 points or higher and were sent the Phase 2 Confirmation of Interest E-mail to schedule a time to complete Phase 2 (see Appendix I) – half (11) confirmed their interest and scheduled a time to complete Phase 2. The Confirmation of Interest E-mail specified that Phase 2 participants would need a smartphone to complete the simulated shopping task, and none who responded to this e-mail indicated that they did not possess a smartphone. It was therefore assumed that all those who were scheduled to complete Phase 2 of the study possessed a smartphone. In case a Phase 2 participant forgot to bring a smartphone, the principal investigator possessed a smartphone that could have been used; however, this did not occur.

The principal investigator possessed a smartphone that could have been used by a Phase 2 participant if

All 11 participants were sent the Reminder E-mail the day prior to each scheduled session as a reminder of the scheduled time and to bring their smartphone (see Appendix J), and all 11 completed Phase 2. As a pilot study, this total of 11 participants who have completed Phase 2 has proved an acceptable sample, comparable to other projects of a similar nature (such as Higginson et al., 2002). Phase 2 participants' consent to participate was obtained before commencing the Simulated Shopping Task in written form.

4.3. INSTRUMENTS

This research project has relied on three interdependent instruments in an attempt to inform the Research Questions laid out in Section 1.2.

1. Phase 1 – Nutrition Information Use Survey
2. Screening Tool
3. Phase 2 – Simulated Shopping Task

This section will henceforth describe the development of these instruments and justify their use in this research project.

4.3.1. PHASE 1: NIU SURVEY

The NIU Survey was delivered online using Opinio software. It consisted of a total of 33 questions. The NIU survey consisted of multiple choices, scale-based questions that had participants to indicate their level of agreement with various statements (see Question 10-22, Appendix A), and ranking questions that had participants to assign relative levels of importance to various factors related to food behaviours (see Questions 9 & 24, Appendix A). Some questions incorporated opportunities to elaborate with open-ended response fields (see Questions 23, 28, & 31, Appendix A). Each question was presented singularly to participants, and questions were not numbered. To move forward through the survey, each question had to be answered before a participant could click the 'Next Question' button to continue on through the survey. Some questions concerning identifying information provided a 'prefer not to respond' option, which would allow participants to abstain from providing personal information that some might find intrusive and could help remove restrictive barriers related to socio-demographic categorization for those who do not identify with these traditional concepts, such as the gender dichotomy (see Questions 3, 4, 5, & 30, Appendix A). Participants could move back through survey questions to an earlier, answered question without losing progress if they wanted to reconsider or change a response. Participants could also save their progress at any point and finish the survey later by inputting an e-mail address, which would prompt Opinio to send an e-mail message

with a hyperlink to the partially completed survey. The survey was expected to take between 10-15 minutes to complete.

Part 1 of the NIU Survey was designed to collect basic descriptive data about the sample, including: age range, gender, level of education, and faculty of study (see Questions 1-9, Appendix A). Also, participants' housing situation, which would have some impact on shopping behaviours, was measured; presumably, an individual living independently would shop for groceries more often than a student living in university-owned housing with a dining services meal plan. Still, regardless of one's living situation, one could be responsible for procuring the majority of one's own food, so participants also confirmed whether or not they *shop for the majority (over 50%) of the food* they eat, and to indicate how often they *shop for groceries* (see Questions 7 & 8, Appendix A). Finally, Question 9 asked participants to rank a total of 10 factors from the 'Most Important (1)' to the 'Least Important (10)' in influence on their selection of foods. This ranking question was inspired by Question 9 of the *TNT Survey*, which asked participants to rank the importance of several factors that affect purchase behaviours—including taste, nutrition, convenience, and cost on food selection—using a scale from 'Not at all important' to 'Very important' (Canadian Council of Food and Nutrition, 2008). Ranking questions were utilized to prompt each participant to decide which factors were more important than other competing factors in perceived affect on the individual's food choices. This format made it impossible for two factors to be considered equal, prompting participants to select one factor over another in general importance instead of rating them separately with scale-based responses, which would allow for multiple factors to be attributed the same relative level of importance.

Part 2 of the NIU Survey consists of scale-based questions incorporated from several studies related to nutrition information behaviour (see Questions 10-22, Appendix A), many of which were incorporated into Pohlmeier et al.'s (2012) *Knowledge and Health Consciousness Scale* (NKHCS). The NKHCS tool utilized three subscales developed in previous studies to examine various aspects of nutrition behaviour, including Burton et al.'s (1999) study on nutrition information use, Moorman's (1990) study on nutrition knowledge, and Kraft and Goodell's (1993) study on health consciousness (Pohlmeier et

al., 2012). As several studies referenced in the Literature Review of Chapter 3 (see Section 3.1) have found positive relationships between food label information use and levels of health consciousness (Grunert, Wills, & Fernández-Celemín, 2010; Hess et al., 2011; Souiden et al., 2013; Visschers et al., 2013; Cooke & Papadaki, 2014) and nutrition knowledge (Drichoutis et al., 2006; Canadian Council of Food and Nutrition, 2008; Cooke & Papadaki, 2014), and a number of the measures incorporated into this tool had implications on ingredient information use, they were incorporated into the NIU Survey. As many of the statements incorporated into Pohlmeier et al.'s (2012) NKHCS tool consistently associated positive nutrition behaviours with the 'Strongly Agree (7)' response, it was suspected that it might be too easy for participants to rush through Part 2, misrepresenting actual behaviour by consistently agreeing to statements reflecting positive nutrition behaviours – by adding some negative and neutral toned statements, participants may be prompted to think more about their responses. In an effort to counter this potential for misrepresentation, one measure from the NKHCS tool was inversed (NIU Question 13), and several were added in order to neutralize the overall nature of Part 2 of the survey (NIU Questions 12, 16, 21, & 22). The added statement for NIU Question 16 was sourced from Moorman (1990), from which Pohlmeier et al. (2012) drew several measures originally, citing Moorman's (1990) tool as a validated measure of nutrition information use. The added statements comprising NIU Questions 12, 21, and 22 were all sourced from Roininen, Lähteenmäki, & Tuorila (1999), who created a survey to measure consumers' attitudes toward healthy and hedonic characteristics of foods. These statements from Roininen et al. (1999) were expected to serve a dual purpose; first, they would help accomplish the aforementioned goal of neutralizing the overall nature of Part 2, and second, they would provide an outlet for participants who were not necessarily health conscious individuals with high levels of nutrition knowledge to answer some questions positively, without becoming discouraged by constant disagreement. Ideally, this could help reduce misrepresentations attributable to social desirability bias by providing opportunities for those who are not particularly health conscious or knowledgeable about nutrition to select positive responses, and well as to encourage participants to think more

about their responses by interrupting the flow of reporting positive food label behaviours with the 'Strongly Agree (7)' response.

Part 3 of the NIU Survey was intended to verify the findings published in the *TNT VII* Survey (see Questions 23 & 24, Appendix A), which reported that the 'Ingredient List' was the most selected response to the statement: "when you are looking at the label which of the following do you look for?" (Canadian Council of Food and Nutrition, 2008). According to the report, 80% of participants stated that, when looking at the food label, they look for ingredient information (Canadian Council of Food and Nutrition, 2008). The original *TNT VII* Survey question was incorporated into the Nutrition Information Use Survey as Question 23 (see Appendix A). However, while this *TNT VII* Survey question has measured use versus non-use, it does not necessarily inform the relative importance of the list of ingredients compared to other food label components in consumers' food choices. In an effort to ensure that Phase 2 participants use ingredient information, participants were asked to rank the food label components in order of importance when *deciding whether or not to buy a food item in the supermarket* (see Question 24, Appendix A). Additionally, both these questions inform Research Question 1 (see Section 1.2). Responses to Question 23 confirm that participants likely use ingredient information in some capacity, while Question 24 indicates the relative importance of the list of ingredients compared to other components of the food label.

Part 4 of the NIU Survey addresses specific aspects of ingredient information use (see Questions 25-30, Appendix A), before concluding the survey with a few supplementary questions (see Questions 31-34, Appendix A). Some of these questions were designed to confirm a trend with implications toward ingredient information use that had been reported in several studies related to food label information use, such as the tendency for consumers to focus on negative food attributes instead of positive attributes (Worsley, 1996; Shine et al., 1997; Burton et al., 1999; Balasubramanian & Cole, 2002). Additionally, based on hypothetical reasoning, Savolainen and Kari's (2004) *Information Source Horizon* model (discussed in Chapter 2, Section 2.1) was used to conceptualize possible reactions to unknown ingredients on listed on food labels, which served as multiple-choice responses to Questions 28 and 29 of the NIU Survey. Many questions

incorporated into Part 4 of the NIU Survey inform Research Question 1, while Questions 28 and 29 inform Research Question 2 (see Section 1.2). Finally, Question 30 from Part 4 asked participants if a serious allergy forces that participant to *pay close attention to what is in your food* (see Appendix A) – which the reader will realize in the upcoming two chapters may be an important predictor of the likelihood and nature of ingredient information use.

At the end of the survey, participants were asked if they would be interested in being contacted to participate in Phase 2 of the study, offering an honourarium of $15 to any who completed the Simulated Shopping Task (see Appendix B). If interested, participants were asked to provide a personal contact e-mail address that could be used to schedule a session to complete Phase 2 (see Question 33 & 33a, Appendix A). Participants who did not provide a contact e-mail address were thanked for their participation, presented with a hyperlink to the Survey Incentive Prize Draw [Survey Thank You Screen] (see Appendix A). The incentive prizes were drawn after data collection for Phase 1 had ended by Dr. Sandra Toze, who proceeded to contact the winners of the incentive prize draw and deliver the prizes (see Appendix K). The principal investigator did not contact or meet with the winners of the incentive prize draw. The contact e-mail addresses collected for the Incentive Prize Draw had no connection with the data provided by participants, unless a participant used to same contact e-mail to express interest in completing Phase 2 – in which case the participant had already voluntarily associated their survey data with an e-mail address that has been kept confidential. Neither of the Phase 1 participants who were selected as winners of the incentive prize draw completed Phase 2 of the study.

4.3.2. SCREENING TOOL

The Screening Tool (see Appendix C) was used to determine which of the Phase 1 participants who volunteered to complete Phase 2 were the most likely to be frequent label users who utilize ingredient information during food purchase decisions. As the primary focus of this research project concerns how consumers use ingredient information, it made sense to focus attention on those individuals most likely to use this particular type of information. The Screening Tool was developed by the principal investigator to filter out

prospective Phase 2 participants that were most likely to use ingredient information. While reasons for not using ingredient information could prove interesting and worth measuring in future research, this study has been designed to focus on users of the ingredient information. The Screening Tool utilized NIU Survey questions that had either direct or indirect implications toward the use of ingredient information. Points were assigned for 10 questions in total from Part 2 and 3 of the NIU Survey, with a maximum possible score of 96 points. See Appendix C to for a summary of Screening Tool point allotment.

4.3.3. PHASE 2: SIMULATED SHOPPING TASK

The Simulated Shopping Task was designed to qualitatively confirm and explore the use of ingredient information in the food choice process. It consisted of several questions prompting participants to make food choice under a number of hypothetical conditions that were intended to prompt food label and ingredient information use (see Appendix B). These questions related to the hypothetical purchasing of 6 pre-packaged food products, including 2 pre-packaged products from each of 3 food categories that exemplified a several variables related to ingredient information. Specifically, 2 bottled spinach and cheese pasta sauces, 2 canned chicken noodle soups, and 2 multi-grain O-shaped cereals (see Appendix L). None of these products claimed to contain organic ingredients. These products were presumed by the principal investigator to be relatively common foodstuffs, selected because of their relative consistencies in Nutrition Facts table information and overall physical properties, while exemplifying various differences in lists of ingredients. Note that the food products used were consistent in type, using 2 'spinach & cheese' pasta sauces instead of a 'spinach & cheese' variety and a 'Portobello mushroom' variety; this level of consistency was intended to limit the likelihood of participants' making food choices based strictly on abstract preferences that could simply the food choice and render the label information null in the process, such as an aversion to mushrooms prompting the selection of the 'spinach & cheese' option without considering the food label information content. These products were therefore selected for both consistencies and differences among the products – for example, the 'spinach & cheese' pasta sauce products were selected because they were both 'spinach & cheese' pasta sauces

with several of consistencies, but the list of ingredients on one label was longer, harder to read, and contained several additional ingredients, rendering lists of ingredients of the pasta sauce products the most variable in features (see Category 1, Appendix L). The canned noodle chicken soups also had several differences in listed ingredients, as well as differences in Nutrition Facts table information, front-of-package claims, and branding (see Category 2, Appendix L). The multigrain O-shaped cereals were the most similar in ingredient information, with slight variations in Nutrition Facts table information and a distinct difference in branding (see Category 3, Appendix L). This consistency in product type ensured the Nutrition Facts panel information differed only slightly across products; ideally, this reduced the usefulness of the Nutrition Facts table, which could encourage ingredient information use. These products were not selected with the preferences or limitations of prospective participants in mind. Having participants choose between very similar products with distinct differences using specific, food purchase prompting questions was intended to have participants use food label and ingredient information in a natural way, without asking them directly to use it.

The Simulated Shopping Task incorporated a protocol similar to the 'think aloud' strategy employed by Higginson et al. (2002) and Barnett et al. (2013) in an attempt to gain insight into the use of nutrition information in the decision-making process. Participants were asked, at the beginning of the session, to verbalize any factors that were considered in the decision-making process, to gain insight into what nutrition information they used or considered when making these hypothetical food choices (see Appendix B). In addition to posing hypothetical food purchase questions, any relevant follow-up questions related to food label use were posed in response to participants' verbalized protocol; in other words, Phase 2 assumed the form of a simulated shopping task embedded within a semi-structured interview about food purchase behaviour in general. The nature of the semi-structured interview format allowed the principal investigator a relative degree of flexibility to pursue relevant topics that were raised by the participant, encouraging a more natural discourse about the participants' actual nutrition behaviours and food-related concerns.

It also helped to disguise the study's focus on the use of ingredient information, waiting for the participant to bring up ingredient information before directly referring to it.

When a participant referenced the list of ingredients, the principal investigator could ask follow-up questions in response to the participants' testimony, but abstained from focusing too heavily on it to avoid drawing any unnatural attention to ingredient information. The semi-structured interview format and pre-determined questions that constituted Phase 2 (see Appendix B) were modelled after the *funneling* strategy employed by Burton et al. (1999), used to disguise the actual focus of the study by starting with non-specific questions about the food products instead of immediately asking questions that were directly related to the list of ingredients (see Appendix B). The simulated shopping task consisted of 6 essential steps:

1. "Have you purchased any of these products before?"
2. "Which of these 6 products would you consider purchasing now?"
3. "Within each product type, which would purchase if you could only purchase one option?"
4. Within each product type, which option is healthier?
5. Is there any information on any of these labels that you are unsure about?
6. Here are 3 ingredients, could you please search them with your smartphone and tell me what they are?

The principal investigator abstained from inquiring about the use of ingredient information until the participant referenced it independently; after it was mentioned by the participant, the principal investigator would pose related follow-up questions but would not focus too much attention to the list of ingredients in an attempt to avoid encouraging unnatural use or inflated importance in the food choice process of each participant. As part of the funneling strategy (Burton et al., 1999), participants were first asked to indicate which product they would buy and to select between products within each food category, before asking them to select the healthier product within each food type before asking them to choose based on healthiness. This strategy was inspired by Higginson et al. (2002), where participants were accompanied to the supermarket on two separate occasions – the first, a normal shopping trip, the second, a shopping trip where they were charged with the selection of the healthiest option. By asking participants to choose the healthiest option, participants who had not yet used ingredient information may resort to it, or to whatever information they

might otherwise use to determine healthiness. While this approach may encourage unnatural food label information use, the funneling strategy allowed participants to demonstrate natural behaviour before asking them to make a food choice based on healthiness and therefore should not have an overly negative impact on the results. The measure was more so incorporated to give participants who had not used the list of ingredients up to this point in the Phase 2 protocol one final opportunity to use it naturally. Several participants based their earlier food choices on healthiness, beginning the protocol by trying to determine the healthier option.

A lab environment was selected to host Phase 2. Although a supermarket setting could provide the most natural environment for a food shopping experiment, as demonstrated by Higginson et al. (2002) and Barnett et al. (2013), it could also prove a more chaotic and inconsistent environment. First, consider the items selected for the study (see Appendix L), as well as the nature of the questioning; each product would have to be revisited several times in order to effectively apply the funneling strategy, which would have resulted in several laps of the supermarket and required the effective navigation of the aisles to relocate each individual product. The lab setting also removed the prospect of most distractions, as well as the impact of any onlookers on the participants' behaviour, as being followed by a researcher may draw attention, or the perception of the drawing of attention, that could have affected the participants' behaviour. The lab setting was determined to be the most efficient and consistent way to conduct Phase 2, given the nature of the protocol that has been described.

Finally, as Research Question 2 sought to discover the nature **of supplementary information seeking behaviours are prompted by the list of ingredients** (see Section 1.2), participants were asked to perform an information search via smartphone for supplementary information about 3 pre-selected ingredients from the food labels utilized in Phase 2 (see Appendix L). This task was performed at the end of the session, allowing participants many opportunities to use ingredient information naturally, as well as the opportunity to use their smartphone independently, before deliberately asking them to do so. Participants were reminded in both pre-Phase 2 correspondences to each bring their smartphone to complete of Phase 2 (see Appendices I & J). Participants were also reminded

during at the beginning of Phase 2 that they could use their smartphone at any point in any way that they might naturally do so while shopping in the supermarket to help make food choices (Appendix B). During the session, the principal investigator would sit to the immediate left of participants, so as to provide a good vantage point toward the smartphone screen, noting which Internet resources were accessed and how many were accessed. Participants were also asked to verbalize any perceptions of the nutrition information accessed via smartphone, how their interpretation of this information affected their perception of these ingredients, and if they would still be interested in consuming these ingredients after having performed this information search. Even if participants do not use their smartphones while shopping for groceries, the general nature of mobile Internet searching could be informed by participants' behaviour while completing Step 6 of the simulated shopping task (see Appendix B).

4.4. PROTOCOL

4.4.1. PHASE 1: NIU SURVEY

Upon launching the NIU Survey on February 24, 2015, at 13:00, the Survey Advertisement E-mail Message (see Appendix D) was e-mailed to every contact listed in Appendix G. That same afternoon, the Facebook Recruitment Post was posted to several Facebook 'walls' created for the use of Dalhousie University students (see Appendix E), while the Recruitment Bulletin Poster was posted on many bulletin boards across Dalhousie's three Halifax campuses (see Appendix F). For a complete summary of the distribution of recruitment tools, see Appendix G. After a week, 'comments' were made on each Facebook post related to the end date of the survey—March 10, 2015—so as to effectively return the post to the top of the groups' 'walls' and initiate a Facebook 'Notification' in the accounts of all members belonging to each Facebook group. Also, after the first week, a tour was made of all the bulletin boards with a Recruitment Bulletin Poster to ensure that the posters remained undamaged with plenty of tabs left, replacing posters when warranted. The survey remained open for exactly two weeks, and was closed on March 10, 2015, at 13:00.

Upon inputting the NIU Survey URL or clicking an NIU Survey hyperlink, participants were presented with the 'Survey Introduction – Please Read' screen that provided the essential details of the study (see Appendix A). Part of this introduction detailed the requirement to enter the Incentive Prize Draw: that the survey must be fully completed to enter and that a contact e-mail would be required in order to contact the prizewinners. The introduction also proposed the prospect of participating in Phase 2 of the study. Prospective participants reading the introduction were informed that they could withdraw from the NIU Survey at any point before completing the survey, but also that they would not be able to withdraw their data after submitting the survey. Finally, the Survey Introduction also served as a consent form, in that those who were not interested in continuing to complete the survey were instructed to *close this Internet browser tab*, while those who were interested in participating would consent to participate by completing the survey, clicking 'Start Survey' button to begin.

At the end of the survey, Phase 1 participants were asked if they would be interested in completing Phase 2 of the study (see Question 33 & 33a, Appendix A). Participants who were not interested simply answered 'No' to question 33, continuing to the 'Thank You – Completed' screen, while participants who were interested in completing Phase 2 answered 'Yes', prompting Question 33a (see Appendix A). Question 33a provided more details about participating in Phase 2 of the study. Those who, after reading these details, remained uninterested answered 'Not interested' for Question 33a and moved on to the 'Thank You – Completed' screen. Those who were interested in completing Phase 2 after reading Question 33a inputted a contact e-mail address that could be used to confirm their interest and schedule a time to complete the study (see Appendix A). By voluntarily providing a contact e-mail address, participants consented to receiving the Confirmation of Interest E-mail (see Appendix I). After inputting a contact e-mail address and clicking the 'Finish Survey' button, participants who were interested in completing Phase 2 continued to the 'Thank You – Completed' screen. Upon reaching the 'Thank You – Completed' screen, participants could proceed to the Incentive Prize Draw (see Appendix H) by selecting the button hyperlinked to the NIU survey (see Appendix A). Participants

who chose to enter the Incentive Prize Draw entered a contact e-mail address in order to enter the draw for 1 of the 2 gift cards, which was later drawn on April 13, 2015.

4.4.2. SCREENING TOOL

Immediately after closing the NIU Survey, the Screening Tool was applied to the survey responses of all participants that indicated being interested in completing Phase 2 (see Appendix C). The Screening Tool was systematically applied to the survey responses of 198 participants, calculating a total score out of a possible maximum of 96 points. The 22 participants that scored highest on the screening tool, with scores of 88 points or higher, were contacted with the Confirmation of Interest E-mail (see Appendix I). A total of 11 participants confirmed their interest and scheduled a time to complete Phase 2. The day before each of these scheduled sessions, the Reminder E-mail was sent to each Phase 2 participant.

4.4.3. PHASE 2: SIMULATED SHOPPING TASK

Participants were met at the main entrance of the Rowe Building on Dalhousie University's Studley Campus and escorted to the Usability Lab (Room #2030) in the Rowe Building of Dalhousie University's Studley Campus. Upon entering the lab, participants faced a desk with the products already laid out on it and were asked to sit in a chair to the right of where the principal investigator sat to complete the study. The principal investigator then proceeded to provide the essential information about the study, as summarized in the 'Pre-task Brief' of the Phase 2 Script (see Appendix B). The participant was then provided a consent form to read through and sign if the terms were deemed agreeable, as well as a copy to keep for themselves (see Appendix M). When consent was acquired, the audio recorder was turned on and Phase 2 began.

First, participants were asked to take as long as they liked to examine the Food Products (see Appendix L) laid out before them. In most circumstances, the principal investigator proceeded to follow a standardized protocol that varied slightly depending on the responses of the individual, summarized in Appendix B. Questions like *have you ever*

purchased any of these products before (see Step 1, Appendix B) could prompt some participants to discuss many aspects of food purchase or nutrition information behaviours, depending on the personality of the participant.

After each participant had finished the simulated shopping task, data recording concluded when the audio-recording device was turned off. Participants were offered the honourarium of $15 as an expression of gratitude for their completion of the study. Participants were also offered contact information so that they could later inquire about the findings of the study, or alternatively to voice a concern about the project to Dalhousie University's Research Ethics Board.

4.5. Data Analysis

4.5.1. Phase 1: Quantitative Analysis

The data collected via NIU Survey was stored on a university-owned server located on Dalhousie's campus. Upon closing the survey, the principal investigator exported the data to Microsoft Excel and the Screening Tool was immediately applied, so as to be able to initiate Phase 2 of the study as quickly as possible. Before the principal investigator began analyzing Phase 1 data, every incomplete NIU Survey was excluded from the data set. A total of 69 incomplete surveys were excluded. A small number of participants completed the survey in its entirety but did not click the 'Finish Survey' button (see Question 33a, Appendix A) – these surveys were considered complete and included in the final data set. Having excluded the incomplete surveys, the principal investigator calculated appropriate descriptive statistics to summarize the results from Phase 1. Excel was then used to generate pivot tables that compared responses for key questions in an effort to identify any relationships that may exist between questions.

4.5.2. Phase 2: Qualitative Analysis

Several opportunities to provide open-ended responses were incorporated into the NIU Survey. However, few participants engaged in these opportunities and, within the

responses of those who did, there were few instances in which any of these contributed much insight toward the goals of this study.

Having finished data collection for Phase 2 of the study, the principal investigator transcribed the audio-recorded using Microsoft Word to create transcripts. To facilitate the thematic analysis of the qualitative data collected, these transcripts were uploaded to NVivo. Before commencing the thematic analysis, the transcripts were reviewed so as to become familiar with the content before attempting any preliminary coding. A six-phase approach to thematic analysis proposed by Braun and Clarke (2006) was essential to the success of this analysis. The steps that were taken have been described in numbered steps:

1. The first attempt at coding focused on the application of semantic codes, systematically considering every statement related to food, nutrition, and nutrition information behaviours, as advised in Braun and Clarke (2006).
2. To ensure the iterative application of all codes, another round of semantic coding was performed to ensure that codes identified in later transcripts would be thoroughly applied throughout all eleven transcripts.
3. A peer Master of Library and Information Studies (MLIS) student performed an external audit to increase the validity of the coding of Phase 2 transcripts.
4. In the possession of an extensive list of semantic codes, Furst et al.'s (1996) Food Choice model (see Figure 3, Section 2.2, p. 16) was utilized as a conceptual framework to organize the codes.
5. All codes identified through semantic coding fit into this framework – the coding hierarchy can be observed as Appendix N – Coding Hierarchy.
6. Organizing the data in accordance with Furst et al.'s (1996) model was the first step in the development of themes, which began in accordance to the thematic coding protocol laid out Braun and Clarke (2006).
7. Given the study's focus on the use of ingredient information (see Section 1.2), a theoretical approach to thematic analysis was adopted (Braun & Clarke, 2006) – therefore, the majority of attention was directed toward identifying themes related to the use of ingredient information.
8. NVivo software was used to generate summaries of the applied codes for analysis.

9. Summaries of codes related to the use of ingredient information were focused on to identify the various themes discussed in Chapter 6.

Ultimately, given the nature of the semi-structured interview and the extent of semantic coding applied, the data contained many themes that are interesting and important in their own right, but remain beyond the scope of this research project as defined by the Research Questions articulated in Section 1.2. In order to effectively focus this study, a theoretical approach to thematic analysis was applied that focused primarily on themes related to the use of ingredient information in food purchase decisions. While this may have resulted in a description of Phase 2 data that is less rich overall, it has allowed for a more detailed analysis of the various uses of ingredient information (Braun & Clarke, 2006). A realist stance was adopted in order to effectively analyze these themes, focusing on the experiences and perceptions of participants (Braun & Clarke, 2006). This was most appropriate given the nature of the study, which focused on the individual process of making food related decisions.

Conceptually and practically, Furst et al.'s (1996) Food Choice model was essential in the development of the coding hierarchy, the identification of themes, and the eventual thematic analysis. There are several factors that justify this reliance on Furst et al.'s (1996) Food Choice model as a framework for thematic analysis. Most notably, Furst et al. (1996) incorporates multi-disciplinary elements that transcend the study of food-related behaviour and the study of information seeking behaviours, such as the importance of context on the individual experience (see Section 2.2). Furst et al. (1996) describes **a specific type of information seeking** behaviour, as the making of *Value Negotiations* is dependent on the interpretation of information, while the decision-making process in general inherently involves the seeking and interpreting of information. Further, as Furst et al. (1996) defined the essential components of their model, definitions that conveniently served as categories that facilitated the organization of the semantic codes. Most importantly, Furst et al. (1996) forced the consideration of <u>how</u> consumers use ingredient information by prompting the differentiation between *Value Negotiations* and *Strategies*, which has proved an important consideration related to the nature of this usage. Finally, utilizing Furst et al. (1996) as a conceptual framework for thematic analysis has tethered this qualitative analysis of

reported nutrition behaviours to the original theoretical framework grounded in the information sciences, helping to establish the importance of information seeking behaviours in the making of food choices.

4.6. VALIDITY & RELIABILITY

Several strategies have been incorporated into both phases of this mixed-method research project increase the validity and reliability of this mixed-methods approach. Peer consultation was critical throughout the development of the protocol, instruments, and data analysis strategies (Creswell, 2007).

To increase the reliability of the NIU Survey, it was presented in a standardized format to all participants (Leedy & Ormrod, 2013). Also, certain questions were asked in multiple ways throughout the NIU Survey, including several different questions that asked about the use of the list of ingredients (see Questions 15, 23, and 24), as well as back-to-back questions that concerned the supplementary seeking of information in-store via smartphone (see Questions 28 & 29).

A mixed-methods approach has increased the validity of the findings of this thesis, as the NIU Survey results of Phase 2 participants have been triangulated with the actual behaviour exhibited while completing the simulated shopping task, confirming that their self-reported behaviours were consistent with their actual behaviours (Creswell, 2007). The Screening Tool would have excluded this participant from Phase 2 (see Section 4.3), had this been reflected in the participant's response to Question 24 (see Appendix A). Additionally, several strategies have been incorporated into this project to increase the validity of Phase 2 of the study. Several of the scale-based questions that were incorporated into the survey had already been subject to internal validation in past research by Pohlmeier et al. (2012) using Cronbach's Alpha scores. It will become apparent throughout Chapter 6 that a thick, rich description of the qualitative findings has been provided, supported by quoted evidence of the identified trends to validate the reported findings for the benefit of the reader (Creswell, 2007). An iterative process of semantic coding benefitted greatly from NVivo software, which facilitated the systematic application of this process to strengthen

the reliability of the process (Creswell, 2007). Further, after having developed an extensive list of semantic codes and applied them throughout the Phase 2 transcripts, inter-rater reliability was increased with an external audit was performed by a peer MLIS student that served to validate the applied codes and to refine the coding strategy (Leedy & Ormrod, 2013).

4.7. SUMMARY OF METHODOLOGIES

Chapter 4 began by reviewing the various methodologies that have been used to study food label information use. In order to effectively study how consumers use ingredient information in the food choice process, a mixed-method strategy incorporating complementary quantitative and qualitative measures was selected to gain insight into the individual-level experience of the food choice process (Stewart et al., 2008). A survey was designed to collect quantitative data, contextualize the population, and recruit participants to complete the simulated shopping task, which was designed to qualitatively explore the use of ingredient information within the food choice process. The simulated shopping task was selected for its potential to examine both the cognitive and behavioural elements of the food choice process, as well as the level of control that it granted over the variability in ingredient information on product labels that were presented to the participant. This mixed-methods approach employed the Nutrition Information Use Survey (see Appendix A), alongside a hybrid qualitative methodology that combined the elements of a semi-structured interview and a simulated shopping task called the Simulated Shopping Task (see Appendix B).

Phase 1 participants were recruited using a convenience sampling method using a variety of recruitment tools (see Section 4.2). The NIU survey was delivered virtually using Opinio software and was active for a two-week period. While the NIU Survey was mainly employed to collect quantitative data related food label and ingredient information use (see Section 4.3.1), it was also used to recruit participants to complete Phase 2 of the study (see Section 4.3.2). A Screening Tool was used to identify which participants that completed Phase 1 and expressed an interest in completing Phase 2 were most likely to use the list of

ingredients while making food choices. Phase 2 took approximately 1 hour to complete. Participants were asked questions related to the hypothetical purchase of 6 actual pre-packaged products, so as to have participants interact with real food labels. A funneling strategy was used to disguise the project's focus on the use of ingredient information. This was intended to progressively encourage food label use without making any specific reference to the list of ingredients, with the goal of enabling participants to demonstrate their natural use of ingredient information. Participants were asked to search for 3 pre-determined ingredients via smartphone Internet browser to explore the nature of supplementary information seeking that could be performed while shopping for food.

The quantitative data were exported from Opinio into Excel, where 69 incomplete surveys were excluded before generating basic descriptive statistics. Given that Phase 1 participants were recruited to complete Phase 2, triangulation was incorporated to confirm that self-reported behaviours recorded in Phase 1 were consistent with actual behaviours demonstrated in Phase 2. The analysis of qualitative data collected during Phase 2 relied heavily on NVivo software and the guidance of Braun and Clarke (2006) to systematically apply a thematic analysis strategy. Semantic codes were developed, and then organized into a hierarchy using Furst et al.'s (1996) Food Choice model as a conceptual framework, effectively structuring all semantic codes into a Coding Hierarchy (see Appendix N). While many themes were identified throughout the Phase 2 data, a theoretical approach to thematic analysis was adopted so as to focus primarily on informing Research Question 1 (see Section 1.2): **how do consumers use ingredient information when making food purchase decisions?**

Chapter 5

NUTRITION INFORMATION USE SURVEY

5. OVERVIEW: PHASE 1

Chapter 5 is dedicated to Phase 1 of the study – the Nutrition Information Use (NIU) Survey (see Appendix A). The NIU Survey was employed to gather quantitative data about the nutrition information behaviour of a convenience sample of Dalhousie University students, enrolled during the winter semester that spanned from January 2015 to April 2015. Any reference to a number of participants this and later chapters will be preceded with *n*= for clarity. The NIU Survey was fully completed by a total of *n*=518 participants over a two-week period. An additional *n*=69 participants initiated the survey but did not complete it before the end of the two-week period; the data from the *n*=69 participants that did not complete the NIU has been disqualified from consideration in this study. This chapter will consider the quantitative data collected from the *n*=518 participants that completed the NIU survey completely, effectively participating in Phase 1 of the study.

Section 5.1 describes the participants recruited to complete Phase 1, detailing the demographic characteristics and food-related behaviours reported by survey respondents, including a ranking of the factors considered to be the most important influences affecting their food choices. Section 5.2 describes the various quantitative findings from the NIU Survey. Section 5.3 discusses these results in relation to the Research Questions articulated in Section 1.2. To clarify the formatting of this summary: *italics* were used to highlight the precise wording of questions from the NIU Survey, while single quotation marks were used to indicate a specific multiple-choice or scale-based 'response' to a question, and references to the total number of participants that correspond with a reported percentage have been enclosed in parentheses.

In Chapter 7, these quantitative findings will be synthesized into the greater body of established knowledge on the use of food label information to make food purchase decisions.

5.1. Description of Phase 1 Participants

Approximately 80% (*n*=417) of the participants recruited for Phase 1 were female, while just 18.5% (*n*=96) of participants were male. The majority of participants were under 25 years old, with 44% of participants being between 21-25 years old (*n*=227) and 31.5% of participants being between 18-21 years old (*n*=164). Only 18% of participants were between 25-30 years old (*n*=93), and 6.5% (*n*=34) indicated being over the age of 30. Most participants were undergraduates (*n*=347), while a third of participants were completing a graduate-level degree or PhD (*n*=166). Phase 1 participants were relatively distributed across faculties, with the most represented faculties being the Health Professions (23%), Management (17.6%), and Science (16.2%). Other faculties were under-represented despite recruitment efforts that targeted these faculties, such as 'Law' and 'Engineering'.

Only 16% of participants (*n*=83) indicated residing in residence and having subscribed to a meal plan with the University's dining halls. A great majority of participants indicated shopping *for the majority (over 50%) of the food* they ate (*n*=419), with over 54% of participants (*n*=281) indicating shopping for groceries 'At least once per week' and an additional *n*=39 participants indicating shopping 'Several times per week'. Approximately one-third of participants (*n*=169) indicated that they shop 'More than once per month but less than once per week'. Of the *n*=518 participants that completed the survey, 54.6% (*n*=283) indicated prescribing to no particular dietary practices – presumably assuming some balance of what might be considered the typical Western omnivorous diet. The second most popular dietary practice selected was the 'Flexitarian (semi-vegetarian)' with *n*=71 participants, while *n*=56 participants selected the 'Vegetarian' option. About 9% (*n*=54) of participants indicated having to 'Avoid allergens', while about a quarter of participants (*n*=146) indicated that either they or someone that they share food with has *serious allergies that force* [them] *to pay close attention to what is in* [their] *food*.

Early in the survey, participants were asked to rank ten factors that could affect food choices in order of importance. The factor ranked first by the largest number of participants was 'Taste', as 32% (*n*=166) of participants ranked it the 'Most Important (1)' factor, 27% of participants (*n*=141) ranked it the second most important factor, and 20% of participants

(*n*=104) ranked it the third most important factor. 'Price' was the second most important factor overall, ranked the 'Most Important (1)' factor by about 26% of participants (*n*=133), the second most important factor by 25% of participants (*n*=131), and 21.5% (*n*=111) ranked it the third most important factor. 'Healthiness' was ranked the third most important factor overall, as 22% of participants (*n*=115) ranking it the 'Most Important (1)' factor, 26.5% of participants (*n*=137) ranked it the second most important factor, and 24% of participants (*n*=126) ranked it third. Other notable factors included 'Convenience (easy/quick to prepare)', ranked the fourth most important factor by 23% of participants (*n*=118), and 'Availability (whatever is easiest to get)', which was ranked the fifth most important factor by 30% of participants (*n*=157).

5.2. Reported use of Food label Information

As the goal of this thesis was to explore consumers' use of ingredient information during food choices, it was important to confirm that Phase 1 participants actually used the list of ingredients when making food choices. Participants were asked to indicate which of as many as eight essential components of the food label that they *usually look at* when making food choices (see Question 23, Appendix A), summarized in Table 1.

Food Label Components Usually Looked at	No. of Participants	% of Participants
Nutrition Facts Table	425	82.1%
'Best before' Date	425	82.1%
Ingredient List	380	73.4%
Total Size (weight/volume)	274	52.9%
Serving Size	205	39.6%
Nutrient Content Claims	189	36.5%
Healthy Choice Logo or Symbol	82	15.8%
Health Claims	81	15.6%
None of these…	3	0.6%
Other	12	2.3%

Table 1: Food label components *usually looked at* by Phase 1 participants

A large percentage of Phase 1 participants indicated that they usually looked at the list of ingredients when examining the food label. Just over 73% of participants (*n*=380) selected the list of ingredients in response to this question, making it the third most selected response after the 'Nutrition Facts table' and the 'Best before' date, which were selected by 82% of participants (*n*=425) respectively. Other components of the food label that were usually looked at by Phase 1 participants included the 'Total Size (weight/volume)' of the product, selected by about 53% of participants (*n*=274), as well as 'Serving Size' and 'Nutrient Content Claims', selected by approximately 40% of participants (*n*=205) and 36.5% of participants (*n*=189) respectively.

These results provide some idea of the proportion of Phase 1 participants who may *usually look at* the list of ingredients, but they do not necessarily indicate the relative importance of the list of ingredients compared to other components of the food label. For example, the *n*=82 participants who *usually look at* a 'Healthy Choice Logo or Symbol' may also have selected the 'Ingredient List', but may consider the 'Healthy Choice Logo or Symbol' to be the most important component of the food label. Therefore, another NIU Survey Question 24 asked participants to rank these essential components of the food label by order of importance, from the 'Most Important (1)' to the 'Least Important (8)' when *deciding whether or not to buy a food item in the supermarket* (see Question 24, Appendix A). Table 2 summarizes the number of participants that assigned each possible rank of importance to the ingredient list.

RANK GIVEN	NO. OF PARTICIPANTS	PERCENTAGE OF PARTICIPANTS
Most Important (1)	156	30.1%
2	111	21.4%
3	78	15.1%
4	57	11.0%
5	48	9.3%
6	33	6.4%
7	19	3.7%
Least Important (8)	15	3%

Table 2: Ranks of importance attributed to the List of Ingredients

In total, approximately 30% of participants (*n*=156) identified the list of ingredients as the 'Most Important (1)' component of the food label affecting food choices, with an additional 21% (*n*=111) indicating that it was the second most important component and 15% (*n*=78) indicated that it was the third most important component. The Nutrition Facts table was the only component of the food label that received more 'Most Important (1)' ranks than the list of ingredients from Phase 1 participants, with 32% (*n*=166) indicating that it was the 'Most Important (1)' component, while 29% (*n*=149) determined that it was the second most important component and 15% (*n*=78) determined that it was the third most important component. Figure 4 has summarized the total number of 'Most Important (1)' ranks attributed to each component of the food label – indicating that the Nutrition Facts table, list of ingredients, and 'Best before' date were clearly considered the three most important components of the food label by Phase 1 participants.

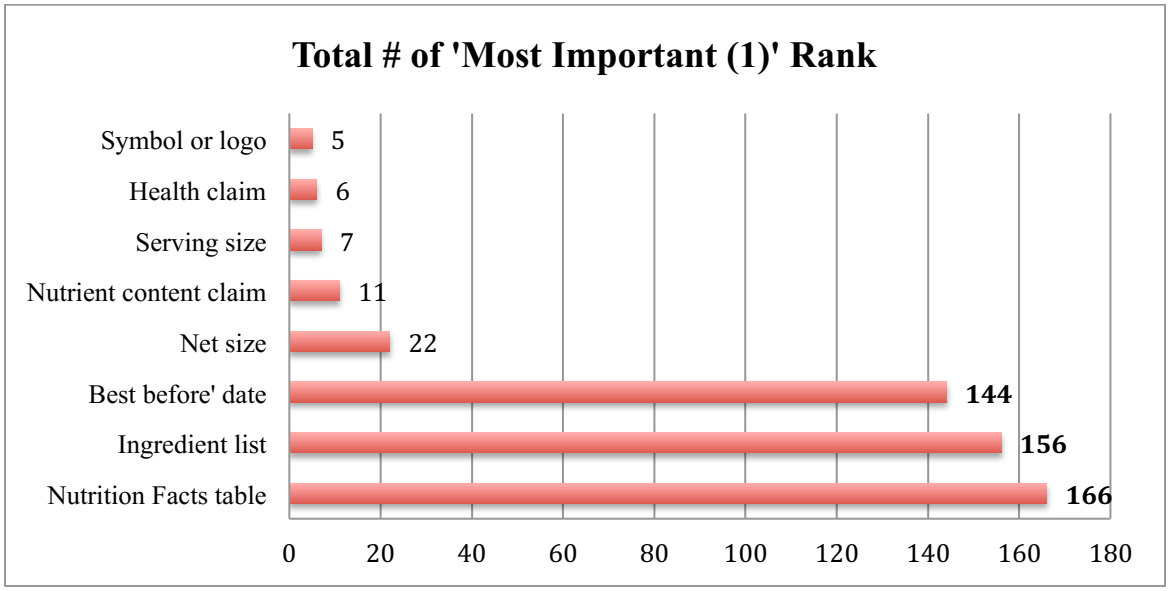


Figure 4: Total # of 'Most Important (1)' ranks assigned to components of the food label

However, upon calculating the average rank assigned to each component, it became apparent that the average rank assigned to the list of ingredients was actually the third highest overall, behind the Nutrition Facts table and the 'Best before' date, which has been summarized in Table 3. Note that the Nutrition Facts table, the 'Best before' date, and the list of ingredients were ranked significantly more important than the other components of

the food label, with a significant difference of 1.74 in average rank between the third and fourth highest ranked components.

Food Label Component	Average Rank
Nutrition Facts table	2.53
'Best before' date	2.91
Ingredient list	3.01
Net size	4.75
Serving size	5.25
Nutrient content claim	5.42
Health claim	5.98
Healthy choice logo/symbol	6.30

Table 3: Average rank of importance attributed to food label components

With an average rank of 3.01, the list of ingredients was, overall, the third most important factor, as the Nutrition Facts table received an average rank of 2.53 and the 'Best before' date received an average rank of 2.91. These 'Most Important (1)' components of the food label each received a similar number of high rankings, making their average ranks notably higher than the next most important factor, being Net size at an average rank of 4.75.

Part 2 of the NIU Survey addressed various aspects of food label use, using 7-point scale-based responses to indicate participants' agreement with statements related to nutrition information behaviour (see Appendix A). Of these statements, one in particular directly concerned the use of ingredient information: *I usually read the ingredient list on food labels* (see Question 15, Appendix A). The most popular response to this statement was 'Agree (6)', selected by 26.5% of participants (n=137), followed closely by 'Somewhat Agree (5)', which was selected by 25% of participants (n=131), while about 15% of participants selected 'Strongly Agree'. In total, over two-thirds were in at least partial agreement with the statement, while just n=11 participants indicated rarely reading the ingredient list by selecting 'Strongly Disagree (1)'. Several other questions from Part 2 of the NIU Survey had direct or indirect implications on the use of ingredient information when making food purchase decisions – responses to these questions have been summarized in Table 4.

Statement	Strongly Disagree			Neutral			Strongly Agree
	1	2	3	4	5	6	7
Q10. I am always interested in obtaining more information about... personal health.	2	1	18	40	106	196	155
Q11. I am confident that I know a lot about the topic of nutrition.	2	19	33	69	211	148	36
Q12. Generally, I eat what I like and try not to worry too much about what's in my food.	46	129	147	45	90	53	8
Q13. I rarely read nutrition labels at the grocery store.	83	140	104	42	62	60	27
Q14. I am concerned about my health all the time.	8	30	53	82	160	137	48
Q15. I usually read the ingredient list...	11	48	64	51	131	137	76
Q16. There are so many foods that are bad... I try not to worry about what I eat.	96	199	112	47	44	18	2
Q17. I read more health-related articles and webpages than I did 3 years ago.	8	52	31	65	107	178	77
Q18. I am interested in reading nutrition- or health-related information when shopping [for food].	10	40	55	90	143	132	48
Q19. I do not know very much about nutrition.	72	185	129	63	45	23	1
Q20. I always read the food label before purchasing a new food item.	19	58	75	43	132	110	81
Q21. I do not really avoid any particular food, even if... unhealthy ingredients.	63	154	106	64	81	44	6
Q22. I try to avoid foods that contain additives.	13	52	84	91	143	107	28

Table 4: Summary of responses to Part 2 of the NIU Survey

Some of these statements—such as, *I do not really avoid any particular food even if it contains unhealthy ingredients* (Question 21, Appendix A)—had direct implications on the use of ingredient information. In response to Question 21, 30% of participants (*n*=154) selected 'Disagree (2)', 12% of participants (*n*=63) selected 'Strongly Disagree (1)', while an additional 20% of participants (*n*=106) selected 'Somewhat Disagree (3)'. Additionally, several statements had potential implications on the use of ingredient information, such as *I*

always read the food label before purchasing a new food item – a statement with which *n*=81 participants 'Strongly Agree (7)' and *n*=110 'Agree (6)', while another *n*=132 'Somewhat Agree (5)' (see Q20, Table 2). Only *n*=19 completely opposed this statement, selecting 'Strongly Disagree (1)'. Further, *n*=132 participants selected 'Agree (6)' in response to being *always interested in obtaining nutrition- or health-information when shopping in the supermarket*, while *n*=48 'Strongly Agree (7)' with the statement (see Q18, Table 2). A total of *n*=140 participants 'Disagree (2)' and *n*=83 participants 'Strongly Disagree (1)' that [they] *rarely read nutrition labels at the grocery store* (see Q13, Table 2). *n*=199 'Disagree (2)' that, because *there are so many foods that are bad for you*… [they] *try not to worry about what* [they] *eat*, while a further *n*=96 'Strongly Disagree (1)' with that statement.

While some of these scale-based questions had implications on the use of ingredient information, the latter sections of the NIU Survey contained several questions that were crafted to explore specific aspects of ingredient information use. For example, Question 25 asked participants if they ever looked at a list of ingredients to make sure that a particular ingredient was contained in a product; approximately 55% of participants (*n*=286) indicated that they had. Question 26 asked participants if they had ever looked at a list of ingredients to make sure that a particular ingredient was not contained in a product, to which 86.5% of participants (*n*=448) indicated that they had. Slightly fewer participants (*n*=396) indicated that the position of an ingredient within a list of ingredients affects their food purchase decisions, totaling approximately 76.5% of the sample population (Question 27, Appendix A).

One of the more interesting aspects of ingredient information use concerns participants' reactions to unknown ingredients listed on the food label. Participants were asked to indicate any number of seven possible reactions to encountering an unknown ingredient listed on a food label in the past, with a field to provide an open-ended response to report any other reactions (see Question 28, Appendix A). Responses to this Question 28 have been summarized in Table 5. The most popular response was 'Bought it anyway – I trust government regulations make all ingredients safe to eat', which was selected by approximately 51% of participants (*n*=263). Alternatively, about a third of participants

(*n*=176) indicated that, upon encountering an unknown ingredient, they have 'Put it back on the shelf – if I can't pronounce it, I don't want to eat it' – the third most popular response.

POSSIBLE REACTIONS…	NO. OF RESPONSES	PERCENTAGE OF PARTICIPANTS
Bought it anyway – I trust government regulations make all ingredients safe to eat	263	50.8%
Asked a store clerk about the unknown ingredient	13	2.5%
Call friend/family member that knows a lot about food/nutrition	41	7.9%
Bought it, but looked up the ingredient online later	206	39.8%
Used my smartphone to look up the ingredient in the store	228	44%
Put it back on the shelf – if I can't pronounce, I don't want to eat it	176	34%
None of the above.	38	7.3%
Other…	8	1.5%

Table 5: Results for NIU Survey Question 28.

Only 1.5% of participants (*n*=8) selected the 'Other' option and, of the open-ended responses provided by participants, the majority were either reiterations or slight variations of the seven possible reactions. The only open-ended response that provided some insight into an alternative behaviour was "substituted for a similar product," which was not a preselected option – though it could arguably fall under the 'Put it back on the shelf…' behaviour. The second most popular response to this question was 'Used my smartphone to look up the ingredient in the store', which was selected by 44% of the sample (*n*=228). The following question asked about using a smartphone to look up information about an unknown ingredient while shopping in a supermarket, to which a slight majority of 54% of the sample (*n*=281) responded that they had, at some point, engaged in such behaviour in the past (see Question 29, Appendix A). This discrepancy is interesting and troublesome to explain. It may be that *n*=53 participants did not remember that they had engaged in such

behaviour when completing Question 28, but then remembered upon being prompted by Question 29 (see Appendix A). It may also be a case of the misreporting of a desirable behaviour, suggested in Chapter 3 (see Section 3.1) to be a factor to consider when collecting self-reported data concerning of nutrition- and health-related behaviours.

5.3. Discussion of Phase 1 Results

The quantitative results collected in the NIU Survey have informed the primary Research Questions articulated in Section 1.2. This final section of Chapter 5 will be dedicated to the discussion of these results in relation to this study's research questions.

Let us consider the most basic and broad research question motivating this project – **how do consumers use ingredient information when making food purchase decisions?** By posing this question first, it has been presumed that those participating use ingredient information – fortunately, over 73% of participants (*n*=380) selected the list of ingredients when asked *when you are looking at a food label, which sections do you usually look at?* Similarly, in response to NIU Survey Question 15, over two-thirds of the population were at least in partial agreement with the statement *I usually read the list of ingredients on food labels*. Participants' responses to these two questions suggest that the ingredient information has been used, to some degree, by upwards of two-thirds of the sample. However, these questions give little indication about the importance of the list of ingredients – particularly in comparison to other components of the food label. Therefore, in order to explore this relative level of importance, NIU Survey Question 24 prompted participants to rank the importance of the list of ingredients compared to other components of the food label when *deciding whether or not to buy a food item in the supermarket*. Just under a third of participants (*n*=156) indicated that the list of ingredients was the 'Most Important (1)' component of the food label that affects their purchase decisions – superseded only by the Nutrition Facts panel, which was determined to be the 'Most Important (1)' component by 32% of participants (*n*=166). Further, an additional 21% of participants (*n*=111) indicated that the list of ingredients was the second most important component and 15% of participants (*n*=78) indicated that it was the third most important

component. In total, approximately two-thirds of participants consider the list of ingredients to be one of the three most important components of the food label when making food purchase decisions. Additionally, Questions 12 and 16 of the NIU Survey presented statements that did not directly reference the use of ingredient information, but have implications for its use – responses to these questions demonstrate that a significant proportion of the sample care about the content of their food, and may very well use ingredient information to appease their alimentary concerns. Having established that Phase 1 participants reported using ingredient information, the nature of its use can be considered.

One of the more basic ways that the list of ingredients can be used resonates highly with me, as I was introduced to it by my mother in the early years of my childhood. When we would shop for pre-packaged breakfast cereals in the supermarket, my siblings and I would have to find a cereal that did not list sugar as one of the top 3 ingredients. As my first exposure to food label information use, this could be considered the first of many developments to my own *Personal System*, which has since evolved to such a degree that it has inspired this entire thesis project. Having sufficiently reminisced, Question 27 of the NIU Survey explored this type of behaviour by simply asking participants if the *position of an ingredient within the ingredient list ever* [matters]… when deciding whether or not to purchase a food product – which over three-quarters of participants (n=396) responded that it does. As this figure is slightly than that of NIU Survey Question 23, to which n=380 participants indicated *usually looking at* the list of ingredients, it would be reasonable to assume that the use of ingredient information to avoid negatives would be one of the more common uses of ingredient information that may even be performed occasionally by those who are not heavy users of food label information. This is another trend that has been explored more extensively in Phase 2 of the study, but this quantitative evidence gives weight to the potential prominence of this behaviour.

An important theme that has emerged from the data is that of avoidance – using ingredient information to identify what is perceived to be negative and that should be avoided. While this was most apparent in the qualitative data collected during Phase 2 (see Section 6.3), there were several preliminary indications of this trend collected in the NIU

Survey. Perhaps the most compelling evidence supporting this trend emerged in the responses to Questions 25 & 26, which asked participants if they had *looked at an ingredient list to make sure a particular ingredient was contained in a product* and if they had *looked at an ingredient list to make sure a particular ingredient was not* [contained] *in a product*. Significantly more participants, upwards of 86% of the participants (*n*=448) indicated that they had used ingredient information *to make sure a particular ingredient was not* [contained] *in a product*, while just over half of participants indicated having used the ingredient *to make sure a particular ingredient was* [contained] *in a product*. Additionally, a number of statements incorporated into Part 2 of the NIU Survey had implications on the use of ingredient information (see Appendix A). Question 21 had direct implications on the nature of ingredient information use, stating *I do not really avoid any particular food, even if it contains unhealthy ingredients* – again, almost two-thirds of participants indicated that they were in, at least partial, disagreement with the statement, implying that they try to avoid foods with ingredients that are perceived to be unhealthy.

Similarly, but to a lesser degree, around half of the participants were in agreement with the statement *I try to avoid foods that contain additives*. While this statement does not explicitly imply ingredient information use, the list of ingredients is one food label component that can be used to determine the presence or absence of additives – alternatively, so could a front-of-package claim related to additives. This last statement from Part 2 of the NIU Survey concerning the avoidance of additives suggests an interesting consideration in the use of ingredient information, as the term 'additive' is rather ambiguous and non-specific, but may automatically be presumed negative depending on the participant. This ambiguity around *additives* may be the reason for the clustering of responses on either side of 'Neutral (4)', with approximately 60% of respondents choosing responses between 'Somewhat Disagree (3)' and 'Somewhat Agree (5)' – for there may be positive additives as well as negative additives, depending on the perceptions of the individual consumer. As defined by Health Canada (2013), a food additive "…is any chemical substance that is added to food during preparation or storage…" that is "…used in food to maintain its nutritive quality, enhance its keeping quality, make it attractive or to aid in its processing, packaging or storage…" For example, salt is an additive that has

played an integral role in the modernization of food production and preservation – while one might want to limit its intake, it might also be difficult to label salt as entirely negative. Furthermore, given the complexity of modern food production practices, there may also be food additives that are entirely unknown to the consumer. This type of scenario prompted Research Question 1 (B) (see Section 1.2), **how do consumers react to foods with unknown or unfamiliar ingredients?**

While this is another research question that has been explored more elaborately in Phase 2 of the study, Question 28 from the NIU Survey has indicated how consumers react to unknown ingredients listed on food labels. Participants were able to select any number of the predetermined responses, as well as input any alternative behaviour that had not been included in the responses. While the most popular response to this question was 'Bought it anyway – I trust government regulations make all ingredients safe to eat', another popular response, selected by 34% of participants (n=176), reflected an interesting sentiment that reverberated in participants' testimonies collected during Phase 2, as a significant number of participants had 'Put [a product] back on the shelf – if I can't pronounce it, I don't want to eat it'. Such behaviour in reaction to unknown ingredients could certainly be an effective way to avoid negative unknown ingredients, but it could also cause the avoidance of positive unknown ingredients as well. This phenomenon is explored more extensively in Chapter 6 (see Section 6.3), as pronounceability has emerged as an important factor when considering the ingredients listed on a food label. However, the avoidance of unknown ingredients that are difficult to pronounce cannot be the most effective or accurate way to evaluate the content of a food product and avoid negative ingredients – though it may be an efficient strategy to achieve this end. The NIU Survey also measured the prevalence of other *Strategies* employed to determine the nature of unknown ingredients through various types of information seeking behaviours, conducted both within and beyond the supermarket environment.

Some of these responses related to Research Question 2, **what types of information seeking behaviour are prompted by the list of ingredients?** The second most popular answer, selected by 44% of the sample, was 'Used my smartphone to look up

the ingredient in store' – representing an active, deliberate effort to bridge a gap in nutrition knowledge upon encountering an unknown ingredient. In addition, Question 29 of the NIU Survey addressed this particular behaviour, as it was hypothesized that some consumers use their smartphones to determine the nature of unknown ingredients. When asked directly, an additional *n*=50 participants determined that they had indeed *used* [their smartphone] *to search an ingredient that* [they] *were uncertain about while shopping* for food. While it may be that any of these *n*=50 participants realized, after reading Question 29, that they had engaged in this behaviour in the past, this may also be a case of over-reporting positive nutrition behaviour (see Section 4.1). Nonetheless, it does appear, based on these responses, that supplementary nutrition information seeking via smartphone does occur in the supermarket – however, as will be revealed in the next chapter, the frequency with which this in-store smartphone information seeking may not necessarily be high, and it may only occur in certain circumstances under the right conditions. Another popular response to this question was 'Bought it, but looked up the ingredient online later' – selected by 40% of participants (*n*=206). This response implied another type of active, deliberate information seeking behaviour, but a type that occurs outside of the supermarket and after the product has been purchased. Occurring after the product has been purchased, these instances of supplementary information seeking may affect future food purchases, as well as whether or not the product is actually consumed. While there was no measure to determine the exact nature of this particular type of information seeking behaviour, it would likely be performed via Internet search using a personal computer, but could also be performed using a smartphone as well; further, those who conduct these searches at home, or in some alternative environment, may be less influenced by temporal factors when performing these supplementary information searches, being able to devote more time toward determining the nature of the unknown ingredient.

Two more responses to Question 28 described alternative types of supplementary information seeking behaviour that are dependent on the verbal exchange of nutrition information between two individuals. The first, 'Asked a store clerk about the unknown ingredient', was selected by just *n*=13 participants. The limited popularity of this response may be attributable to the nature of the modern supermarket, which generally contains

thousands of products and does not necessarily employ nutrition experts who are readily available to satisfy the information needs of consumers. The second, 'Call friend/family member that knows a lot about food/nutrition', was significantly more popular but was still only selected by 8% of participants (*n*=41). Of course, to engage in this second behaviour, one requires a relative or friend with a higher degree of nutrition knowledge, enough to warrant calling (or texting) that individual while shopping, who is reliable enough to respond before the shopping session has concluded.

Chapter 6

SIMULATED SHOPPING TASK

6. OVERVIEW: PHASE 2

The following chapter is devoted to Phase 2 of the study. As the protocol followed for the completion of Phase 2 was described earlier in Chapter 4 (see Section 4.4), this chapter will begin with a demographic description of the Phase 1 sub-sample that was selected using the Screening Tool to complete Phase 2 (see Appendix C), before briefly considering the self-reported behaviours of this sub-sample collected during Phase 1 in Section 6.2. The remainder of the chapter will be dedicated to the description and analysis of the various themes identified throughout the qualitative data collected during Phase 2, relying on Furst et al.'s (1996) Food Choice model as a framework for this thematic analysis (see Section 4.5.2). Letters have been used to represent individual participants (e.g. *Participant A=Participant #2627295*); Appendix O details which letters correspond with original participant numbers. This summary of trends will begin by considering the types of *Personal Systems* that rely on the use of ingredient information (Section 6.3.1), and then will consider in detail some of the consistencies in types of *Value Negotiations* and *Strategies* that were applied to ingredient information or described by Phase 2 participants (Sections 6.3.2 & 6.3.3), before concluding the section with a detailed analysis of the behaviours exhibited by three graduate-level students enrolled in the MLIS program at Dalhousie University in an effort to demonstrate the observed variety in the nature of supplementary nutrition information seeking behaviours via smartphone (Section 6.3.4). Finally, these themes will be discussed in relation to the Research Questions outlined earlier in Chapter 1 (see Section 1.2) in Section 6.4. Chapter 7 will consider the implications of these Phase 2 findings alongside those from Phase 1 in relation to the established research related to food label information use.

6.1. DEMOGRAPHIC DESCRIPTION

A Screening Tool was used to identify prospective participants that were frequent food label information users (see Appendix C). A total of n=22 prospective participants

were selected using the Screening Tool, and were all contacted with the Confirmation of Interest E-mail (see Appendix I). Of those *n*=22 prospective participants, *n*=11 confirmed their interest by answering the Confirmation of Interest E-mail and were scheduled to complete Phase 2. Similarly to Phase 1, the majority of Phase 2 participants were female (*n*=9), while just *n*=2 males agreed to participate of *n*=3 that were selected using the Screening Tool. All four age groups were represented: *n*=4 participants from both groups '18-21 (under 21)' and '25-30 (under 30)' completed Phase 2, while *n*=2 participants from group '21-25 (under 25)' and *n*=1 participant from group '30+' completed the phase. Participants were split evenly between degree levels, with *n*=5 participants completing undergraduate degrees and *n*=5 participants completing graduate level degrees, while *n*=1 participant was in the process of completing a PhD. The Management and Health Professions faculties were both well represented, with *n*=4 participants from each completing Phase 2; *n*=1 participant from each Science, Medicine, and Architecture & Planning faculties participated respectively.

While *n*=10 participants indicated shopping for food 'At least once per week' and *n*=9 of those participants also indicated shopping *for the majority (over 50%) of the food* that they eat, one participant indicated shopping 'Rarely (less than once per month)' and two subscribed to a *meal-plan at the university's meal-hall/cafeteria*. An array of dietary behaviours emerged from the sample, including flexitarian (occasional meat consumption), vegetarian (no meat consumption), pescetarian (consume fish, but no other meats), and paleolithic (a diet consistent of the foods that would have been available to humans in the Paleolithic era, before organized farming, such as meats, nuts, and fruit), with several indicating a desire to support local and regional food industries. A total of *n*=5 participants indicated that allergies affected their shopping behaviour, with either the participant or someone with whom the participant shares food having an allergy. Also, *n*= 3 participants indicated they are 'gluten-free' and *n*=2 participants are dairy-free.

6.2. NIU Survey Results of Phase 2 Participants

A brief consideration of the Phase 1 responses provided by Phase 2 participants increases the validity of the findings by triangulation, confirming the self-reported

behaviours collected during Phase 1 with actual demonstrated behaviours demonstrated during Phase 2 with triangulation.

All *n*=11 participants indicated *usually looking at* the 'Ingredient List' and all *n*=11 participants ranked the list of ingredient as the 'Most Important (1)' component of the food label affecting their food purchase decisions. While just *n*=6 of the participants indicated having *looked at an ingredient list to make sure a particular ingredient was contained in a product*, all participants (*n*=11) indicated having *looked at an ingredient list to make sure a particular ingredient was not in a product*. Also, all participants (*n*=11) indicated that the *position of an ingredient within the ingredient list* matters when purchasing of a food item. Based on these survey responses, it was hypothesized that these Phase 2 participants would be frequent food label users who utilized ingredient information to make purchase decisions. A majority of Phase 2 participants (*n*=7) 'Strongly Agree (7)' with the statement *I usually read the ingredient list on food labels*, while the other *n*=4 'Agree (6)' with the statement. Also, *n*=6 participants 'Strongly Agree (7)' and *n*=5 participants 'Agree (6)' with the statement *I always read the food label before purchasing a new food item*. In response to the statement that *there are so many things that are bad for you… I try not to worry about what I eat*, a majority of Phase 2 participants (*n*=9) selected 'Strongly Disagree (1)'. Similarly, *n*=5 participants 'Strongly Disagree (1)' with the statement *I eat what I like and try not to worry about what's in my food*, while the remainder of participants were split evenly between 'Disagree (2)' and 'Somewhat Disagree (3)', with *n*=3 participants selecting each response respectively. A total of *n*=6 Phase 2 participants 'Strongly Disagree (1)' with the statement *I do not really avoid any particular food, even if it contains unhealthy ingredients*, with the rest of participants either selecting 'Disagree (2)' (*n*=3) and 'Somewhat disagree (3)' (*n*=2). While just *n*=3 participants 'Strongly Agree (7)' with the statement *I try to avoid foods that contain additives*, another *n*=5 participants 'Agree (6)' and *n*=3 'Somewhat Agree (3)' with the statement.

Given that the primary goal of this thesis is to explore the nature of consumers' use of ingredient information, these NIU Survey results were a strong indication that Phase 2 would yield rich qualitative data that would help answer the research questions laid out in Section 2.1. The application of the Screening Tool was an effective strategy to ensure that

Phase 2 participants were highly likely to use ingredient information while completing the simulated shopping task. Compared to the rest of the Phase 1 sample, the sub-sample selected with the Screening Tool (see Section 4.3.2) appeared to be heavy users of ingredient information. Table 6 compares the responses to several NIU Survey questions that had direct implications on the use of ingredient information when making food choices.

NIU SURVEY RESULTS	Phase 1 Participants	Phase 2 Participants
Average rank of importance attributed to 'Healthiness' (Q9)	**2.82**	**1.64**
Average response to: *I usually read the ingredient list on food labels* (Q15)	**4.85 / 7**	**6.64 / 7**
Average response to: *I always read the food label before purchasing a new food item* (Q20)	**4.67 / 7**	**6.55 / 7**
Percentage of participants that indicated *…usually looking at the…* Ingredient List (Q23)	**73% (380)**	**100% (11)**
Percentage of participants that ranked the Ingredient List as the 'Most Important (1)' component of the food label (Q24)	**30% (156)**	**100% (11)**
Percentage of participants that have [made] *sure a particular ingredient was contained in a product…* (Q25)	**55% (286)**	**55% (6)**
Percentage of participants that have [made] *sure a particular ingredient was not contained in a product…* (Q26)	**86% (448)**	**100% (11)**
Percentage of participants who indicated that the *position of an ingredient* matters when choosing a food (Q27)	**76% (396)**	**100%**
Percentage of participants who looked up an unknown ingredient in-store with their smartphone (Q28)	**54% (281)**	**72% (8)**
Percentage of participants who looked up an unknown ingredient at home after purchasing a product (Q28)	**40% (206)**	**45% (5)**

Table 6: NIU Survey results of Phase 1 participants versus Phase 2 participants.

Another goal of this thesis is to explore what types of information seeking behaviour are prompted by the list of ingredients, particularly in reaction to unknown or unrecognized ingredients. A total of *n*=8 participants who completed Phase 2 indicated having *used* [their] *smartphone to search an ingredient that* [they] *were uncertain about while shopping* for groceries (see Question 28, Appendix B), while *n*=7 indicated having not purchased an item because it contained an unknown ingredient and *n*=5 indicated having bought a product with an unknown ingredient with the intention of looking up the unknown ingredient later.

6.3. Ingredient Information Use in Food Choices

As described in the Data Analysis section of Chapter 4 (see Section 4.5.2), the main components of Furst et al.'s (1996) Food Choice model (Figure 3) were used as the conceptual framework to develop a coding hierarchy to organize the analysis of the qualitative data collected during Phase 2 (see Appendix N). While this process yielded a body of rich data, a theoretical approach to thematic analysis has been adopted to focus on the essential Research Questions driving the study (see Section 1.2) – namely Research Question 1: **how do consumers use ingredient information when making food purchase decisions?** Using Furst et al.'s (1996) model as a framework for this discussion, the remainder of this chapter will describe the various ways that participants used ingredient information while completing Phase 2 of the study.

A brief reminder of the structure of Furst et al.'s (1996) model will benefit the reader and clarify the upcoming qualitative analysis, but it may prove beneficial to review the model in the Theoretical Framework of Chapter 2 (see Figure 3, Section 2.2). At the core of this model is the *Personal System* – the individual's personal process for making food purchase and consumption decisions. *Personal Systems* consist of a combination of *Value Negotiations* and *Strategies* that are implemented when determining whether or not to purchase or acquire a food (see Chapter 2, Section 2.2). A *Personal System* develops over years of personal experience, represented in the model as the *Life Course* and *Influences*, a combination of concepts that combine to form the context (Courtright, 2007).

While contextual factors are essential in the development and functioning of a *Personal System*, as well as to enable the understanding and use of nutrition information, they were not the focus of this project. Contextual factors would be difficult to measure in any comprehensive manner but could warrant focused attention in future research, as they are many, variable, and subject to the perceptions of the individual consumer. Instead, this project focuses on how ingredient information is used when making food choices, revealed in the *Value Negotiations* and the *Strategies* used by consumers when making food choices. As the model has focused on the decision-making process related to food purchases, it has provided an ideal framework within which to consider the understanding and use of ingredient information.

This theoretical approach to thematic analysis has focused on *Value Negotiations* and *Strategies* recorded during Phase 2 that utilized ingredient information when making of food choices. Two general types of *Personal Systems* were identified. The first type is motivated by the immediate physical consequences of allergies, intolerances, and sensitivities that are beyond the control of the consumer. The second is motivated by the moral or emotional consequences of compromising food-related ideals that are voluntarily adopted by consumers, such as healthiness, vegetarianism, or those related to religious practice. The nature of an individual's *Personal System* depends on the contextual factors motivating it and a *Personal System* could incorporate any number of considerations (see Figure 3). The extent that food label information is used in a given *Personal System* is limited by the individuals' capacity to understand and use nutrition information from the food label. The intensity of food label information use in both types of *Personal System* appears to be tied to motivation and related to the individual's perceptions of these consequences; one employing either type of *Personal Systems* could be equally motivated to use food label information, depending on the perceived consequences of compromising one's *Personal System*. The ensuing analysis of Phase 2 data will explore how consumers use ingredient information by focusing on the *Value Negotiations* and *Strategies* employed by participants that relied on ingredient information to make food choices, utilizing Furst et al. (1996) as a conceptual framework.

6.3.1. PERSONAL SYSTEMS

Upon completing data collection for Phase 2, it was clear that the list of ingredients was an important component of the food label that was used by participants to help make food choices. Interestingly, both types of *Personal Systems* were centered on avoidance.

That is not to say that consumers do not also look to the list of ingredients for positive ingredients, but there was a general tendency to focus on negative factors and to weigh these negative factors more heavily than positive factors. Variance between these *Personal Systems* emerge in the different information needs, knowledge, perceptions, and understanding unique to each individual, reinforcing the importance of context in the food choice process. While both types of system involved participants' looking for either the presence or absence of specific ingredients, and types of ingredients, several interesting differences emerged in the information that was sought and how it was used. Those concerned with the immediate physical consequences related to allergies, intolerances, and sensitivities were focused primarily with the avoidance of ingredients that could trigger a reaction—and, in some cases, only with the avoidance of allergens—using a consistent process to determine the presence or absence of these triggers. As this first type of *Personal Systems* is focused on avoiding illness brought on by triggers of their allergies, intolerances, and sensitivities, they will be referred to as trigger-focused *Personal Systems*. These trigger-focused consumers may also incorporate *Value Negotiations* and *Strategies* to address other food-related concerns, but the satisfaction of this primary objective was the most important concern of these consumers. Alternatively, ideal-focused *Personal Systems* appear more variable, focused on the achievement of food-related ideals by avoiding ingredients that would compromise this achievement.

6.3.2. VALUE NEGOTIATIONS

According to Furst et al. (1996), *Value Negotiations* are a central component of a *Personal System* that involve the weighing and accommodation of values that are relevant to the individual. It is in these *Value Negotiations* that the influence of contextual factors on food choices became apparent, as contextual factors influence not only the information that

is considered but also how this information is understood. While many types of *Value Negotiations* were identified in the Phase 2 data, this section will focus on those reliant on ingredient information. *Value Negotiations* are dependent on the individual's perceptions, which are informed by accumulated nutrition knowledge and other contextual factors motivating food choices. *Value Negotiations* that were made using ingredient information during Phase 2 can be broadly categorized into two separate groups – those related to specific ingredients or types of ingredients contained within the product, and those related to the physical nature of the list of ingredients, from which implications are drawn about the contents of that product. For an exhaustive list of the *Value Negotiations* identified in Phase 2, see Section 3 of the Coding Hierarchy (Appendix N). The most common and interesting trends within the identified *Value Negotiations* that were reliant on ingredient information will be discussed in the remainder of this section.

It is important to remember that the individual's understanding of ingredient information depends on the established body of nutrition knowledge at the point of purchase. This knowledge can change from day to day, depending on the individual's information seeking behaviours outside and during the food shopping experience. Perhaps inherent in all *Value Negotiations*, participants usually evaluated factors on a scale from negative to positive; generally, a given factor was consistently weighted negatively or positively, ranging from neutral to either pole depending on the value under consideration. A 'negative' factor tended to range from neutral to extremely negative among all participants that completed Phase 2; no factor was considered to be extremely negative by one participant and extremely positive by another. However, exceptions did exist; while some participants considered fats to be negative, others recognized the difference between positive and negative fats. As this particular type of *Value Negotiation* tends to be made using Nutrition Facts table information, it does not have direct implications on the ingredient list. Alternatively, all participants considered sugar to be varying degrees of negative. Sugar content could be evaluated using both the Nutrition Facts table and the ingredient list. Sugar is an interesting example, as there are several types of sugar that could be added to prepackaged food products, but sugar commonly listed simply as 'Sugar' in the Nutrition Facts table. While all participants considered added sugar to be varying degrees

of negative, various types of sugar were perceived to be different degrees of negative; for example, organic cane sugar may be considered less negative than sugar, and both may be considered less negative than corn syrup.

Although trigger-focused participants also considered *Value Negotiations* concerning many other food-related attributes, the avoidance of triggers appeared paramount to these participants when completing Phase 2. Trigger-focused *Personal Systems* are designed to identify the presence of triggers, incorporating several measures to accomplish this goal using information from various components of the food label and relying heavily on ingredient information. While the primary objective of trigger-focused participants was the identification and avoidance of specific triggers, these participants were also be concerned with ingredients that they considered potential triggers. For example, Participant A—a 'gluten-free' participant diagnosed with Celiac disease—stated that she tends "*to stay away from is anything that's modified – so modified corn starch for example, that means that they've augmented it in some way and usually it's with the inclusion of flour. Anything that's dried or powdered, I also am wary of.*" Several times throughout her completion of Phase 2, this participant also expressed a lack of trust in labelling practices, specifically with regard to the listed ingredients; she later stated, "*I know that they are not necessarily required to list allergy warnings, I am also skeptical of what preservatives might be in it that are not honestly labelled.*" She was not the only trigger-focused participant that expressed concern over the provision of warning 'Contains [trigger]' statements, as demonstrated in the self-described protocol of Participant B, who stated that when she reads "*a list of contains items, and wheat or gluten isn't one of them, I still do a quick read back through just to make sure that they didn't, they like, they pulled out all the other ones, but happened to not pull out [the trigger] and highlight it…*" Both participants also expressed a lack of trust in front-of-package 'Gluten-free' claims. As stated by Participant B:

> …A product can be gluten-free and it says it boldly on the front, but I've learned to check the label because I've gotten things home [and after eating a couple pieces, think] why don't I feel so good? And then you go back and you look at the label and it says, "may c… made in a facility where wheat products are processed," or like,

> "may contain wheat" – but you've said on the front that it's gluten-free, so you just really need to watch it.

Likely attributable to past experiences with the mislabelling of triggers, these participants did not appear to trust food-labelling practices, compensating for this lack of trust with various *Value Negotiations* and, as will be discussed later, *Strategies* developed to avoid triggers. This ever-present concern with the avoidance of triggers also had implications for their *Value Negotiations* related to unknown ingredients listed on food labels, as the consumption of an unknown ingredient would be to risk triggering a negative physical reaction. To counter this risk, two of the three participants who indicated being 'gluten-free' described using their smartphones to determine whether an unknown ingredient was related to a trigger or not; the third 'gluten-free' participant had not engaged in this type of behaviour, but stated this was because she did not have a cellular plan that included data. Instead, this third participant described an alternative practice of entirely avoiding any product with a food label. Though it turned out that she meant *most* prepackaged products with a food label, this might be considered an extreme measure to avoid negative ingredients. In short, all participants that described trigger-focused *Personal Systems* were most concerned with the same essential *Value Negotiation*: does this product contain a trigger? Alternatively, participants who described ideal-focused *Personal Systems* concerned, to varying degrees, with a variety of *Value Negotiations* that relied on the use of ingredient information.

Throughout Phase 2, though focused primarily on negative food attributes, participants expressed a preference for positive ingredients over negative ingredients – logically, a preference for 'positive' attributes might be expected. What is interesting about these *Value Negotiations* is that they are dependent on the perceived nature of the ingredient(s) under consideration. For example, descriptors like *natural*, *whole*, *organic*, *real*, and *simple* were valued positively in nearly all circumstances. Alternatively, references to *additives*, *artificial*, *processed*, *modified*, and *genetic modification* were almost exclusively considered negative, while references to *preservatives* were slightly less negative but certainly more negative than positive. In certain cases, participants would identify specific ingredients as either positive or negative, but there were few consistent

trends within these references beyond those related to the nature of ingredients. Some participants, when speaking of their food behaviour in general, referenced positive or negative ingredients outside of those presented on the lists of ingredients on the food labels of the products used for Phase 2. The 'gluten-free' Participant A, for example, indicated that she would not likely purchase any of the products used for Phase 2 because of her gluten sensitivity, but described a hypothetical food choice scenario regarding gluten-free pasta, stating that she "*would probably try to avoid a pasta that was based in corn flour and try to go for something like brown rice or quinoa because it's a whole grain… whereas corn is not as nutritious*." Statements similar to this are found throughout the data, but there exist few notable trends in the specific ingredients referenced.

What is notable was the general tendency to focus much more on the avoidance of negatives than the pursuit of positives. Consider this last quote from Participant A – though she prefers a brown rice or quinoa base, she began by stating her preference to <u>avoid</u> corn. As suggested earlier, those employing trigger-focused *Personal systems* were primarily concerned with the avoidance of triggers but could also incorporate additional considerations unrelated to triggers, as demonstrated by Participant A. There was one product type in particular that prompted interesting and insightful *Value Negotiations* related to ingredient information – more so than any other product type utilized in Phase 2. The pasta sauce category presented two lists of ingredients with perhaps the starkest difference in ingredients, and it was in this food category in which the *Value Negotiations* related to ingredient information appeared to have the greatest impact on food choices (see Category 1: Bottled Spinach & Cheese Pasta Sauces – Appendix L). As Participant C observed, "*I think what stood out with the PC Pasta Sauce, was the fact that there doesn't seem to be a lot of artificial ingredients*." Alternatively, Participant A determined "that there are some preservatives in the Classico one whereas the Presidents' Choice just seems to have whole foods in it." Several participants made comments related to the 'whole' nature of the ingredients in the PC Pasta sauce. Participant D stated that "…*I think that this one was a really good example in that every product that was in the no-name brand was like, a whole ingredient, with the exception of citric acid, whereas this one there's ingredients in it that aren't naturally derived products*." Another, Participant E, while

comparing the information from these two lists of ingredients, stated "…*I like products that I know, and more whole products – so again, I would pick this one because I recognize, other than the citric acid, I don't really know what that is too much, I recognize more products in this one than I do in this one*." This last example highlights another consideration dependent on ingredient information: that consumer perceptions of unknown ingredients can have an interesting effect on food choices.

Unknown ingredients were perceived by participants to be either negative or neutral. Consistent with this last statement from Participant E, a general preference for known ingredients emerged throughout the data. *Value Negotiations* related to unknown ingredients assumed a variety of forms throughout Phase 2, one of which appears in this same statement – a preference for familiar ingredients. Participant E expressed this *Value Negotiation* very early on in the session by stating, "*I just always read the first few lines [of the list of ingredients] and that usually gives me a pretty good idea of what I think is in it – if I see a bunch of words I don't understand, I don't like that so much usually*." Unknown and mysterious ingredients were generally observed warily and the tendency to assume the unknown to be negative was quite common. Participant F expressed a similar opinion of unknown ingredients, indicating that she used "*the ingredient list to see how many, I guess, words I didn't know… and whatever had the ones like, the ones I didn't recognize I wouldn't probably buy…"* determining to select a product because "*it has more veg[etables] in it, and less things that I don't know what they are*." Participant E demonstrated another type of *Value Negotiation* related to unknown ingredients, indicating that the position of an unknown ingredient within the list of ingredients can also affect the evaluation of the importance of that unknown ingredient, stating "…*this one has stuff higher up that I don't know what it is, so… and this one the first ingredient is water, so I'll take this one*," selecting the Primo brand soup over the alternative option. Furthermore, the number of unknown ingredients in a food product also appears to play a role in food purchase decisions. Participant B indicated that "…*if it has other ingredients that I am not sure of, like if it has a lot of ingredients, then I normally just put it back on the shelf, like I don't really need that, and I go for something else*." Later in the session, when describing hypothetical shopping behaviour, Participant B reaffirmed that the number of unknown

ingredients affected her purchase decisions, stating that "*if it was the only questionable ingredient in something, and if I really wanted the product, I would have taken it… if there was more than one, I would have put it back on the shelf, without even looking it up*." Apparent in these statements is a general tendency to associate unknown ingredients with negativity.

Similar to the unknown or unfamiliar ingredients, the pronounceability of ingredients is another factor that affects their food purchase decisions, as several participants cited an aversion to ingredients that are difficult to pronounce. Participant F stated that when foods "…*have things in them that I can't pronounce and I don't know what they mean, or can't spell it or you know, speak it, then I won't buy it*." In this case, difficult pronounceability has been associated with the unknown, and both have been associated with negativity. This trend persisted in the testimonies of several Phase 2 participants. Similarly, Participant B confirmed that she likes "…*to choose products that I can actually read the ingredients, and I'm not a very… my first language is English, and I only know English, but I'm not… if I can't pronounce it, then I don't like to buy it*." Participant B also demonstrates how pronounceability can be used as a *Value Negotiation*, stating, "…*most of [the ingredients] are fairly pronounceable… Um… there's nothing really there that, the one at the end, beta-carotene, kind of concerns me*." Participant D made a similar-natured assessment, half-heartedly stating "*I can pronounce almost all the ingredients on here so that's pretty decent*." In such cases, it appears that the acceptability of some foods is determined through the phonetic complexity of the listed ingredients, which is interesting because often some of the more phonetically complex ingredients are added vitamins and nutrients – attributes which are likely evaluated positively in the Nutrition Facts table. This tendency to hastily judge ingredients by the complexity of their presented name without any additional information searching was well articulated by Participant G, who declared that "…*there's some kind of sketchy sounding ingredients in both though, I don't know if they're bad, but they're very… oh ok, they're vitamins… they just have horrible names*." Just like unknown and unfamiliar ingredients, those that were considered to be more difficult to pronounce also tended to be perceived negatively by participants.

Perhaps related to pronounceability, 'chemical' or 'chemical-sounding' ingredients we also perceived by several participants to be negative in nature and something to avoid. Again, within these statements, participants referred to these 'chemical' ingredients as if their exact nature was unknown. For example, Participant C stated that "…*most of the time I can identify what the different ingredients are – if there's a lot more ingredients in one that look a bit more chemical, I guess, then I'd tend to lean away from that*." Similarly, Participant H stated, "…*if it begins with a whole bunch of like glucose, or a lot of sodium and such, or just chemicals you can't even – like, you don't know what they are then it's probably not something that you want in your body*." In total, 4 participants identified 'chemical' ingredients, with various degrees of conviction in their judgments. However, in order to realize the implications of these judgments of "chemical" ingredients, consider Participant I's testimony:

> Participant I: Ok. Well I am going to look at the ingredients' list. There's sugar *and beta-carotene… I don't know what that is… it sounds like a chemical,* but they're close… fairly close to the same… and this one… um, there's only one ingredient that I don't know… inulin… but other than that, I think these ingredients are a little bit more… I know none of these are organic but I think these are a little more… natural.
>
> Principal investigator: That's important to you?
>
> Participant I: Well *I don't want to eat something with a lot of chemicals in it…*
>
> **Emphasis added by researcher.*

As demonstrated by Participant I, judging an unknown ingredient as a "chemical" that should be avoided could lead to the avoidance of naturally occurring ingredients and that are part of a normal, healthy diet – as *beta-carotene* is a plant-produced pigment abundant in the yellow, orange, and red coloured plants, such as carrots (Higdon, 2004). This phenomenon of perceiving certain unknown ingredients as 'chemical' and therefore negative is interesting. Negative evaluations of 'chemical' ingredients may be attributable to the presumed purpose of these ingredients in food. Participant G provided insight into the assumptions related to "chemical-sounding" ingredients stating, "*...a lot of times when I read these sort of chemical-sounding names, I think that it's probably like a preservative type thing*." Alternatively, there are likely many cases in which a 'chemical' ingredient is a preservative, making an effective strategy to avoid preservatives but one that may also

result in the inadvertent avoidance of other types of ingredients. The avoidance of ingredients based on these assumptions would fit into the *Strategies* component of Furst et al.'s (1996) model, which will be discussed in more detail in the next section.

Thus far, the focus has been on *Value Negotiations* related to the specific ingredients listed in a list of ingredients, but there were also *Value Negotiations* related to the physical nature of the list of ingredients. Several participants who completed Phase 2 expressed a general preference for products that contained fewer ingredients, or a shorter list of ingredients, over a longer list of ingredients with a greater number of ingredients. Participant I evaluated the PC Pasta Sauce as preferable for this reason and stated, "*I like this one better because the ingredients list has less stuff*." Similarly, Participant D preferred the Multigrain Cheerios for the same reason stating, "*I would probably go for the Cheerios, because it had a shorter ingredient list*." This evaluation was interesting because the ingredient information listed on both cereal food labels was very similar in content and size, but the Cheerios label presented the ingredient information differently, segregating the 'Vitamins' from the rest of the list of ingredients. This gave it the appearance of being shorter, while effectively highlighting vitamins and minerals that may otherwise be judged negatively as difficult-to-pronounce or unknown. When deciding between pasta sauces, Participant J determined that the list of ingredients on the Classico food label was "*much longer than this one*" and that she could "*say every single word*" in the PC list of ingredients, making it more desirable. In this case, the physical length of the list of ingredients was evaluated alongside other factors like pronounceability, suggesting that, in such cases, several related *Value Negotiations* can combine to make a purchase decision between two products. Such factors may be taken into consideration and influence purchase decisions, but may not necessarily be the most influential factor. A similar combination of *Value Negotiations* can also been observed in the testimony from Participant G, who stated:

> …One of the things that defines what I purchase is kind of the length of the ingredients list, and the longer the ingredient list oftentimes, you know, it has more unpronounceable things in it… um, and so, I recognize all of the ingredients in the Presidents' Choice pasta, and this other one is, it has, it looks like it has more preservatives…

This testimony from Participant G presents an interesting assumption that a longer list of ingredients is more likely to contain unknown or difficult-to-pronounce ingredients, which is an example of a heuristic strategy used to make food purchase decisions. These heuristic *Strategies* will be discussed in much more detail in the next section, but there is another common type of *Value Negotiations* related to the physical nature of the list of ingredients that must be considered before moving on to the next section, namely the position of a particular ingredient within the list of ingredients.

Participants who completed Phase 2 considered this type of *Value Negotiation* in two general ways. Participants either considered specifically the order of ingredients, or considered the primary ingredients as a relevant *Value Negotiation* to consider. In both cases, participants were generally concerned with the position of a 'negative' within the list of ingredients. Several participants indicated being most concerned with the first few ingredients listed in the list of ingredients, referred to in this thesis as the 'primary ingredients' of a product. As ingredients are listed by order of largest mass (Canada Food Inspection Agency, 2014), the first few ingredients presumably comprise the largest proportion of the product. Therefore, some participants focused on the primary ingredients to understand food content and ensure that a negative ingredient did not comprise a significant proportion of the product. Participant E stated "*I always look at ingredients first, and I usually don't like… check out the first three, four big time, and then kind of scroll through and see if I understand what's in it*." She later elaborated, speaking hypothetically about choosing a cereal, "*say this one was a dollar cheaper – I'd probably immediately reach for it, but then if I saw sugar was the first ingredient, and not the fifth or whatever it is, then I would switch and get the more expensive one*." In this hypothetical instance, the position of a single 'negative' ingredient within the list of ingredients may prove the deciding factor in a point-of-purchase decision. Similarly, Participant K stated, "*if I see like, high fructose corn syrup, or like, sugar is the first couple ingredients, I'm probably going to go for the option that doesn't have that as the first couple ingredients*." Scanning for a single and specific 'negative' within the list of ingredients is a heuristic strategy that can be used to streamline the decision-making process, which will be elaborated upon in the next section. Participant H articulated why these primary ingredients are more of a

concern than those ingredients listed lower in the list of ingredients, stating, "*they typically list them in order of how much there is right, so… yeah if they have a few weird things at the bottom it's… I dunno… it's not a huge deal to me*." This particular *Value Negotiation* demonstrates an important consideration affecting the nature of either type of *Personal Systems*: the nature of a *Personal System* depends on the motivation behind employing it. Those with less intense motivations may be less invested in food choices, employing *Personal Systems* with more basic *Value Negotiations* that reflect these motivations.

This section has described several types of *Value Negotiation*, many of which may prove the deciding factor in a food purchase decision, depending on the individual, the shopping context, and the food product under consideration. However, Furst et al.'s (1996) Food Choice model is not necessarily meant to focus on these factors individually, but instead to consider the holistic process of food-related decision-making. Many participants described *Strategies* used to make food purchase decisions, in which specific *Value Negotiations* are considered systematically in an effort to increase the efficiency of the food choice process.

6.3.3. STRATEGIES

According to Furst et al. (1996), *Strategies* develop over time as consumers refine their *Personal Systems*, forming heuristic processes that become routine components of the food choice process. Whereas *Value Negotiations* are one-time evaluations of food-related factors, *Strategies* manifest as short-cuts where specific pre-determined information is used to make a quick decision – for example, a single instance in which the sugar content of a food is evaluated would be a *Value Negotiation*, but systematically choosing products based on sugar content would qualify as a strategy. The various *Strategies* that utilize ingredient information identified in this study were motivated by the avoidance or limiting of negative food content, which was achieved by scanning or comparing, and in some cases was complemented by supplementary information seeking behaviour, to satisfy information needs that are important to the individual. The consumer can rely on a few essential criteria that are related to the most important information needs instead of considering every possible quality of a product under consideration, making the food choice process more

efficient. One of the more difficult aspects of reporting about *Strategies* in this study lies in the methodologies implemented for Phase 2, in that the semi-structured interview and Simulated Shopping Task could not measure the frequency with which any reported behaviour would occur outside of the simulated shopping task. This made it occasionally difficult to distinguish a *Value Negotiation* from *Strategies*, and vice versa. The remainder of this section will describe the various *Strategies* dependent on the use of ingredient information that were reported by Phase 2 participants.

Many participants described *Strategies* used to help make food purchase decisions, some of which involved the general avoidance of entire types of food products and manufacturing processes. Some participants began with statements like that of Participant D, who stated, "*right off the bat, I would not purchase any of these items if I was going grocery shopping*." In such circumstances, these participants had, for various reasons, determined in the past that either canned soups, bottled pasta sauce, or breakfast cereals should be avoided entirely. Participant F went so far as to suggest that she tried to "*avoid anything with a label*," though admitted several exceptions to this professed strategy throughout her completion of Phase 2. Others could tell immediately, due to the nature of the products presented in Phase 2, that they would most likely contain triggers and therefore be inconsumable, such as Participant A. Such testimonies were not for naught, as these participants were able to describe their food label information use hypothetically, as well as were prompted to make a purchase decisions as if for another and not themselves, as described in Section 4.3.3. Participant G mentioned avoiding the aisles of the grocery store in general, stating, "*I basically shop the edges of the grocery store right, and so, I am looking for protein, and I am looking for fruits and vegetables*." While these *Strategies* do not depend directly on ingredient information, they may be motivated by the desire to avoid those 'negative' ingredients that can be found in many pre-packaged foods. There were several other strategies observed during Phase 2 that did rely directly on ingredient information to help make food choices.

Participants utilizing trigger-focused *Personal Systems* relied on very similar sets of *Strategies* to make purchase decisions, which were heavily dependent on the use of ingredient information. Several of these *Strategies* were heuristic in nature, used as

shortcuts to help make the food choice process easier. Participant A—an individual who had been diagnosed with Celiac Disease—began by looking for the presence of the *Canadian Celiac Association* logo on a product label, which would automatically indicate that a product was acceptable to consume, or alternatively a logo or claim indicating the presence of a trigger. If no relevant logo could be located, this participant utilized another heuristic strategy, checking the 'Contains…' or 'May contain…' statements usually found right below the list of ingredients to see if the manufacturer had indicated the presence of a trigger in the product. While a 'Contains [trigger]' statement could disqualify a product from consideration, the absence of such a statement would still prompt the participant to confirm the absence of triggers by reading back through the list of ingredients. As Participant A described, "*looking at this one I did look for the allergy warnings first, and saw that it didn't have any, so then I went to the ingredients' list*." When describing her confidence in labelling practices, she stated, "*I'm always a little bit hesitant just because I don't always trust the ingredients list to tell me… like, a lot of products are doing a better job of saying that they contain wheat*… [But for other types of products]… *I'm always a little bit hesitant, so I'd rather make it myself*." Participant B—another who had been diagnosed with Celiac Disease—demonstrated a similar *Personal System*, although she admitted to not relying much on the *Canadian Celiac Association* logo. A third participant who was allergic to wheat, but not gluten-free, did not exhibit a *Personal System* consistent with the other two trigger-focused participants – remember, she was the participant who declared that she tried to avoid products with food labels altogether.

Other participants who were not bound to the avoidance of triggers also described *Personal Systems* that relied on the consistent application of *Strategies* to make food purchase decisions. Several participants exhibited ideal-focused *Personal Systems* that focused on healthiness, describing similar types of *Strategies* used to make food purchase decisions. These *Strategies* were dependent on *Value Negotiations* that were described in the previous section. For example, Participant D stated, after determining that she would not purchase any of the presented items, "*the main deciding factors that I look to when I do need to purchase an item would be the ingredient list, how many ingredients there are, what the order listing of them is, what ingredients are contained in the product… I don't*

usually look at the nutrition facts." When describing a similar strategy, Participant J stated, "*I'm just looking to see which is more whole foods, if you know what I mean, like more like… vegetables, and stuff like that… and to see the order that they come in, and then how many ingredients, and if there's something that I really don't know what it is*." These pre-determined *Strategies* are convenient and interesting to consider, but most participants did not offer such comprehensive descriptions of their nutrition information behaviour. Other participants revealed various *Strategies* that utilize ingredient information in a much less organized fashion, throughout their completion of Phase 2. The remainder of this section will be devoted to considering these strategies and their implications.

One of the most common *Strategies* used by participants was the comparison of two lists of ingredients of competing products. Due to the nature of this study, which provided two comparable options for each type of food, almost all participants who completed Phase 2 performed comparisons of the food labels. Again, avoidance appears to play a significant role in the *Strategies* implemented to help make purchase decisions. For example, Participant F compared the lists of ingredients on the pasta sauce labels, determining that she would prefer the PC pasta sauce, because the Classico contained "*soybean oil… I would go with the PC choice… and this has soybean oil, which I am not a huge fan of soy, it has calcium chloride, potassium phosphate, lactic acid, like… butter... Yeah… and this, the PC choice, doesn't have any of those in them*." As many examples of the *Value Negotiations* made when conducting this type of comparative strategy have already been discussed in the previous section, a brief mention of them should suffice before moving on to consider other *Strategies*. When comparing lists of ingredients, most participants tended to focus on contrasting the 'negative' elements in products. These negatives generally consisted of specific ingredients consistently deemed negative, such as sugar, or types of ingredients that are generally perceived to be negative, such as additives, 'chemical sounding', difficult-to-pronounce, or unknown ingredients. Often, the outcome of this type of strategy is the selection of whatever product is determined to have fewer negatives. If both products are similar in their negative ingredients, participants either reverted to some other information on the food label, or determined that they would not realistically purchase either product.

Another of the *Strategies* that utilizes ingredient information but differs from the basic comparison of two lists involves the scanning of ingredient information on a single food label. Again, some variability exists within this type of strategy. Some participants, including the trigger-focused participants, scanned the whole list of ingredients looking to avoid negative ingredients. Others were mainly concerned with the primary ingredients, scanning only the first few ingredients to ensure that the most significant components of the food are not negative in nature. For example, Participant H mentioned her mother's influence on her nutrition information behaviour, stating:

> I kind of learned this from my mom… the first couple ingredients, if they're you know like real things, then you're on the right track, and if it's like, if it begins with a whole bunch of like glucose, or a lot of sodium and such, or just chemicals you can't even – like, you don't know what they are then it's probably not something that you want in your body.

Several other participants indicated that they prescribe to similar *Strategies*, suggesting that scanning the primary ingredients is a relatively common practice. Another heuristic strategy, scanning the primary ingredients could be a quick way to determine if a product is acceptable by ensuring that no overly negative ingredients comprise a significant proportion of the product. The consequence of such *Strategies* is that, though more efficient, they may result in the purchasing of a food that does not meet the *Value Negotiations* that are otherwise held by the individual, as articulated by Participant G, who stated, "*I'll end up buying something, and because I've only looked at maybe the first few ingredient list… and then I get further down, and then I feel really ripped off*." In her case, the increased efficiency in the food purchase process is not necessarily worth the consequence of purchasing products deemed later to be inferior or unacceptable. Alternatively, Participant K, who demonstrated the lowest degree of nutrition information use of all participants that completed Phase 2, revealed an interesting reason that some might only consider the primary ingredients, stating "*I don't really read the ingredients list. I read probably the first like, three or four… and then kind of… because like, when you get down here, I don't know what any of that stuff is… any of the big long names*." This testimony is interesting because it provides for an alternative outlook on nutrition to the majority of participants who completed this study; Participant K was to some degree health

conscious, enough to pass through the Screening Tool (see Appendix C),[2] but demonstrated relatively low usage of food label information. She admitted that her focus on the primary ingredients was because of her limited level of nutrition knowledge, which may be closer aligned with the food label use of a greater proportion of Canadian consumers.

These were the most common types of *Strategies* that relied on ingredient information to make food purchase decisions that were professed by Phase 2 participants. Before moving to the last identified type of strategy, the supplementary seeking of nutrition information, it is important to consider the role of another phenomenon which is arguably not properly accounted for in Furst et al.'s (1996) Food Choice model, namely the role of exceptions in food purchase behaviours. Participant D, for example, declared immediately upon commencing Phase 2 that she would not purchase any of the presented products and that her principal concerns revolved around the ingredient information and several *Value Negotiations* associated with it. However, almost immediately after making that statement, she revealed an exception within her *Personal System*, demonstrated in the following exchange:

> Participant D: I don't do canned soup… not even being on sale, or being free at the food bank would entice me…
>
> Principal investigator: No? What about a nice squash soup? Or is it the fact that it's canned that you don't like?
>
> Participant D: Yeah, but squash soup is so easy to make… an onion and a squash, and bouillon…
>
> Principal investigator: A bouillon cube?
>
> Participant D: A bouillon cube…
>
> Principal investigator: And you're ok with those?
>
> Participant D: Yeah, which is kind of ironic because they are like this [the canned soups], but in a cube [laughs]… if I had more money, I would probably go for a broth, like one of the packaged broths…

Participant D indicated that she would not even consider the consumption of these pre-packaged soups under any circumstances—likely because of, as indicated only a few

[2] Participant K indicated in the NIU survey that she was a consistent user of food label information, ranking the 'Ingredient List' as the most important factor affecting her food purchase decisions, and then revealing that she did not use the ingredient list when completing Phase 2. This participant was the only one with a discrepancy between the self-reported behaviour via survey and the measured behaviour collected during Phase 2.

sentences earlier, the ingredients contained in such products—but then admits to using an alternative product that is likely similar in nature and content, openly acknowledging the irony of this exception. As this study has relied primarily on the self-reporting of behaviours, it would be impossible to gauge the extent and frequency of exceptions from Phase 2 data; however, acknowledging their existence and considering their implications is important. Later on in the discussion, another notable exception was revealed:

> Principal investigator: I don't think I asked this, are there any ingredients in particular that you just avoid entirely? That you can think of…
>
> Participant D: You did kind of ask that… Yeah, just anything that I wouldn't add myself I guess.
>
> Principal investigator: Ok, so then you're probably not drinking pop, you're probably not getting aspartame… you're not…
>
> Participant D: I drink pop when I need mix… [laughs]… Yeah.
>
> Principal investigator: Oh I see… fair enough.
>
> Participant D: And at that case it really doesn't matter what's in it…

This confession may be something that many individuals might sympathize with, demonstrating an important consideration for nutrition information behaviour – the importance of circumstance in food choices, prompting exceptions where some or all of the individual's *Personal System* is circumvented. Another exception admitted by Participant G who, with a health-conscious attitude and an admirable *Personal System* motivated by healthiness, described her mindset when purchasing a pre-packaged, frozen pizza, revealed that, "…*it's like, packaged pizza… right, looks good. I don't read the ingredient list, because I don't want to know*." In these cases, participants have nullified, or at least modified, their *Personal Systems* in order to appease their food-related desires in a given circumstance. Furst et al. (1996) does account for these circumstances to some degree in their description of the contextual factor called *Food Context*, which represents the individual circumstance in which a food decision is made. However, their model does not adequately account for the potential to abstain from aspects of the *Personal System* when the consumer is determined to make an exception. Those without trigger-focused considerations have the luxury of forgoing any concern over unknown ingredients at any point in time, a sentiment described elegantly by Participant G, who stated "…*when I am buying stuff that's like, processed, I'm already kind of low [laughs]… it's like, you know, I*

just need to eat something… and so I'm not really in the mood to look up ingredients right?" These exceptions are a luxury that may not be afforded to those employing trigger-focused *Personal Systems*, especially if the trigger prompts a reaction of sickness or discomfort that outweighs the potential satisfaction from making an exception. Also, those dedicated to an ideal-focused *Personal System* may also be unwilling to compromise their *Personal Systems* with exceptions. Willingness to make exceptions likely depends on the devotion of the consumer and the perceived consequences of making the exception.

The last of the *Strategies* that will be introduced in this section is the seeking of supplementary nutrition information, particularly related to unknown or unfamiliar ingredients encountered on the food label. As reported in the previous chapter, when asked about past behaviours in reaction to having *noticed an unknown ingredient on a food label*, approximately 40% of participants who completed the NIU survey indicated that they had *bought* [the product], *but looked up the ingredient online later*, while upwards of 54% indicated that they had, at some point, *used* [their] *smartphone to look up the ingredient in the store*. Throughout their completion of Phase 2, several participants discussed having engaged in these sorts of behaviours in the past. As mentioned earlier, both participants with Celiac Disease indicated having used their smartphones to avoid triggers in the past. A third participant that was allergic to wheat indicated that she had a limited amount of smartphone data and rarely used the Internet on her smartphone. She had never searched for information about unknown ingredients while shopping for food. Early in her completion of Phase 2, Participant A stated that she had searched for supplementary nutrition information with her smartphone in the store, as well as at home, citing one specific resource in particular – the Celiac.org website. When later asked specifically if she had ever used her smartphone to search in-store, she stated "*yeah – usually for preservatives or for things that I can't pronounce or don't recognize*." She elaborated, indicating that much of her supplementary nutrition information searching has been conducted outside of the grocery store, but stated, "…*If I was right in the grocery store, I would probably stick with the Google Summary… because it's quick, and I see that it's related to a vitamin so… I am easily swayed by that*." Furthermore, Participant B described

having engaged in three distinct forms of supplementary nutrition information seeking related to unknown ingredients in the past, stating:

> Sometimes I look it up – like, on my smartphone, just go to Google **(1)**. Um, other times I'll kind of put the product back on the shelf, and say listen, I don't really need this this time, maybe I'll go home and do some research on it **(2)**, and next time I am back in the grocery store and I think I want this, then I might get it. If my research proves, when I go home and Google and see what I can find, um… I haven't – there was one instance when I first went gluten-free that I wasn't sure if Buckwheat was gluten-free, so I ended up calling my mom in the grocery store **(3)**, and I was like, can I eat this? And then she ended up Googling it – but yeah um, so I normally Google.
>
> N.B. *Numbers added by principal investigator to indicate distinct forms of seeking*.

She elaborated, specifying that this behaviour depended on supplementary factors like the number of unknown ingredients, stating "*if there was more than one [unknown ingredient] I would have put it back on the shelf, without even looking that up*." Another participant with no trigger-related concerns, Participant D, reiterated this sentiment, stating, "*I wouldn't even bother looking up and seeing what it is, because it's a list of 9 other ingredients that I have no idea what it is… but if it's maybe something like this, and I didn't know what calcium chloride was exactly, then I might be inclined to look it up*…" Ideal-focused participants described variable histories of supplementary information seeking both in-store via smartphone and at home.

Participant D indicated that while she had engaged in this sort of behaviour before, but that it was not of common occurrence. Other ideal-focused participants indicated having engaged in several types of supplementary information seeking in relation to unknown ingredients in the past. For example, Participant J indicated she had used her smartphone to search before, but that she was more likely to contact her "*friend who is very educated in nutrition, I'd probably text her first*." Similar to one of the participants diagnosed with Celiac Disease who would occasionally contact her mother, Participant J preferred to contact a friend whom she considered an authority on nutrition. This participant also indicated that she reads a number of nutrition-related blogs and watches nutrition-related YouTube videos, and has dedicated school projects to the topic. Similarly, Participant G referenced several online blogs and sources used to acquire

supplementary nutrition information – she was one of just two participants who actually engaged in supplementary information searching with her smartphone upon encountering an unknown ingredient without being prompted; a third, Participant B, searched independently for 'Durum Semolina', but only after having completed the Mobile Internet Search Task component of Phase 2 (see Chapter 4, Section 4.3.3). It is difficult to determine the effect that knowingly participating in a study on nutrition information use had on the behaviour of Participant G, as she admitted to performing such an act "*not so much, unless… yeah sometimes. More in like, sugar kind of stuff. Or if I'm concerned about, I have looked up preservatives, things that I think are preservatives, just to see if that is what I think it is*." Participant G used her mobile Internet browser to search for *Caramel colour*, *Yeast Extract*, and *Sodium Phosphate*, using the Google search engine for both searches. Interestingly, Participant G was the only one to have actively sought specific websites in her Google results that she considered trustworthy. Otherwise, all other participants generally, with some variability, utilized common Internet sources like Google and Wikipedia, or selected random Internet sources from the Google results.

Some of the most interesting findings of this study relate to these trends in information-seeking behaviours of participants when prompted to search for a number of pre-determined ingredients from the food labels used for Phase 2 (see Section 4.3.3). Among these trends, the most common was the use of Google to search the Internet – while Google was the deliberate choice of several participants, it was the default search engine for all who typed their searches into the address bar at the top of the mobile Internet browsers. Consequently, all participants conducted every single Phase 2 searches using the Google search engine and were returned the same 'top ten' search results in identical order. Most participants consulted at least one of these top three results, and many relied on one of these top results to form their perception. Several participants consulted just the Google-provided definition for *Tocopherols* before determining that it was an acceptable, 'natural' ingredient that was not overly negative. Every participant used the Canadian Broadcasting Corporation (CBC) result, and all but one consulted only the CBC result before making a decision about *Hydrolyzed corn protein*, with the majority determining quickly from that source was something that ought to be avoided.

Table 9 summarizes the top three results for each Google search.

TERMS SEARCHED	Result #1	Result #2	Result #3
Tocopherols	Google-definition[3]	Wikipedia	Organictech.com
Calcium Chloride	Wikipedia	Drugs.com	*Google-provided Chemistry[4]
Hydrolyzed Corn Protein	CBC.ca	Wikipedia	blog.fooducate.com

Table 9: Top three Google results for ingredients searched by participants during Phase 2 of the study.

Other participants used several sources to determine the nature of these ingredients, selecting a common source like Wikipedia before scrolling through the results to find something more scientific or academic. Some intentionally avoided Wikipedia, selecting an alternative result. As the majority of participants searched for the exact ingredient name as presented to them by the principal investigator (see Section 4.4), Google returned the same list of top 10 results to every participant, exposing them all to the same sources of information. No participant consulted a second page of results. Consequently, many participants consulted the same sources of information to inform their perception of unknown ingredients searched to complete Phase 2. Several participants formed their perceptions of unknown ingredients from the information provided by a single Internet source without comparing it with a second source, though other participants did compare information from several sources to form their perceptions. In all circumstances, the essential goal of both trigger-focused and ideal-focused participants remained the same: avoid negative ingredients.

Before discussing the results of Phase 2 in relation to the original Research Questions articulated in Section 1.2, it will prove interesting to consider the information-seeking behaviours of a specific demographic that was overly represented in the Phase 2 sample. Three health-conscious master-level students who were enrolled the MLIS

[3] Google-provided definition referenced Result #3 as a source.

[4] Google-provided chemistry details, without reference to food-related usage.

program at Dalhousie University completed Phase 2 of the study. Given the similarities among these participants, they might be expected to exhibit similar information-seeking behaviours.

6.3.4. Detailed Analysis of the Information Seeking Behaviours of 3 MLIS Students

Instead of discussing the smartphone use of every single participant, we might instead consider the nutrition information behaviour of 3 graduate level Management students who completed Phase 2 of the study. All three participants completed Phase 1 of the study, volunteered for Phase 2, and were determined to be frequent food label users that utilized ingredient information to help make food purchase decisions using the Screening Tool (see Section 4.3.2). These three participants were in the process of completing the MLIS program at Dalhousie University, studying many aspects of the information sciences and possessing relatively similar academic backgrounds. A detailed analysis of the information seeking behaviours via smartphone Internet browser of these MLIS students should prove interesting given their similar perspectives as students in the field of information management.

Some of the most interesting insights came from Participant E, a participant who grew up in a vegetarian household, prefers organic produce and ethically raised meat from the farmers' market, and even cooks food for her dog because of her concerns with the possible contents of mass-produce dog food. This participant demonstrated information seeking behaviours that were relatively simple, consisting of a Google search for the exact term. For *Tocopherols*, she only consulted the Google-provided definition. For *Calcium Chloride*, she first consulted the Wikipedia page, before conducting a second Google search for *Calcium Chloride food* after having difficulty finding the desired information. Having added that third keyword, Google provided a definition that she used to make her decision. When asked about the reliability of the sources she consulted, she stated:

> …For these kind of purchases I consider it to be reliable enough… like, if we were talking about something that I know would impact me – like we're not talking about

> something like, if I have a choice of medications I am going to take to help with sort of symptom I'm having, I would spend the time because I consider that decision to be more… to affect my health and to affect me more, than the soup I'm going to choose…

She elaborated, "*it's a convenience thing, is what it comes down to… if I'm at the grocery store and if I am going to take out the extra time to look at my phone, I'm going to look at the first few things I see*…" For this individual, this sort of decision would more so qualify as 'way of life' information seeking behaviour, as she might only search for nutrition information via smartphone once in a while, in the right circumstance, when an unknown ingredient is encountered. Her information seeking behaviours were intended to obtain a basic understanding of the nature of the unknown ingredients to ensure that they appeased her food-related concerns. To obtain this basic understanding, distilled sources like the Google definitions were considered acceptable enough to satisfy her low-level information needs. As she is generally concerned with healthy eating, her shopping behaviours, concentrated on organic products and ethically raised meats from the farmers' market, may limit her exposure to unknown ingredients. Attributable perhaps to the nature of her information needs, her exhibited information seeking behaviour via smartphone was relatively brief and low investment.

Alternatively, Participant A had much more intense information needs. As one of two Phase 2 participants who had been diagnosed with Celiac Disease, she was primarily concerned with avoidance of related triggers; to achieve this, she cooks a lot of her own meals and maintains a relatively static *Personal System* that does not allow for much variability. She generally avoids dairy products, as her partner is lactose intolerant. As she considers her partner while shopping and is herself a relatively health conscious consumer, she employs a trigger-focused *Personal System* incorporating several ideal-focused measures. Depending on the product, she could still purchase it for her partner even if it contained a trigger, she would simply not consume that product herself. Attributed to past experiences with cross-contamination and mislabelling, she expressed distrust for food labelling practices in general. She described a heavy reliance on Celiac.org for nutrition information, mentioning early in her completion of Phase 2 that she had used her smartphone to access this website upon encountering an unknown ingredient in the past;

she attempted to demonstrate its use while completing Phase 2 with some success, but the website was not particularly mobile-friendly. When asked to search for information about *Tocopherols*, she consulted the Google-provided summary before intentionally skipping Wikipedia to select a free academic paper by a PhD candidate from Oregon State University. When asked if she would really conduct that much searching in-store, she admitted that her in-store search would likely have been based on the Google-provided definition. This is interesting because Participant A and Participant E demonstrated the same style of information seeking behaviour, though with slightly different motivations. Whereas Participant E checked to ensure that the unknown ingredients conformed to her standards for healthiness, Participant A needed to ensure that the unknown ingredients were not triggers. When performing her second search for *Calcium Chloride*, Participant A determined to first consult "*Wikipedia, to get the quick facts*," concluding from the Wikipedia page that it was not something she wanted to consume. Finally, when searching for information about *Hydrolyzed Corn Protein*, Participant A consulted the CBC article and noticed immediately that the article made some reference to the ingredient's safety, which made her wary of the product. She performed a secondary Google search, stating that she had noticed a Google-provided 'I'm Feeling Lucky' option for *hydrolyzed corn protein gluten free* while conducting the initial search; she selected that advised search, and scrolled down to find a trusted source – Celiac.com. Interestingly, while its pseudonym *Hydrolyzed Plant Protein* was listed on the page, she decided that *Hydrolyzed Corn Protein* was not an acceptable ingredient for her because that exact term was not listed on Celiac.org, stating the justification that "Celiac research generally tends to treat corn as a grain rather than as a vegetable." Perhaps her conditioned skepticism and distrust prompts such strictness in *Value Negotiations*.

The third MLIS student, Participant G, was a particular active individual who follows a paleolithic diet. Her primary motivation was healthiness, and she demonstrated a high level of ingredient information use during her completion of Phase 2. As stated earlier, she used her smartphone to seek additional information about three unknown ingredients—*Caramel colour, Yeast Extract*, and *Sodium Phosphate*—without being prompted. She searched for *Caramel colour*, perceiving it as a vague "*ambiguous sort of catch-all term*…"

that was an "…*unknown*" ingredient, selecting the Consumerreports.org website because it seemed like "*a bit more of a trustworthy source*." She searched *Yeast Extract* several minutes later, briefly consulting the Wikipedia page on the ingredient before continuing with Phase 2. Before being prompted to search for the pre-determined ingredients she performed a third Google search for *Sodium Phosphate*, citing Livestrong.com as a website that she has consulted in the past, before choosing the MedlinePlus website (U.S. National Library of Medicine – nlm.gov) and reading "*Sodium Phosphate can cause serious kidney damage and possible death*…" When searching for *Hydrolyzed Corn Protein*, she was the only participant to choose a source other than the CBC article, instead consulting a website called Truthinlabeling.org, which she had used in the past, as well as Livestrong.com, before determining that she would have to do more research on the topic. When searching for information on *Calcium Chloride*, she consulted the fourth result, cheesemaking.com. Finally, conducting her sixth and final search, she consulted a result from the Environmental Working Group's Skin Deep® Cosmetics Database – another resource she had used in the past. Participant G exhibited the most variety in information sources consulted. However, when asked if she would be inclined to conduct this much information seeking in a supermarket setting, she responded, "*probably not. I mean, I do occasionally, but it's pretty rare*." However, given her paleolithic dietary practices and her "shop the edges" strategies to avoid the processed foods in aisles, she may not encounter unknown ingredients as often as other consumers. Her professed familiarity with these websites may instead be attributable to her general interest in health and nutrition, as expressed in her following of food blogs.

These MLIS students exhibited three different styles of information seeking behaviours via smartphone Internet browser. The first performed brief, low investment information seeking using the first information encountered to obtain a basic idea of each unknown ingredient, ensuring that these ingredients conformed to her food related concerns. The second performed more invested information seeking, having information needs related to an important primary need, and was therefore more thorough in her seeking and skeptical of her sources. The third performed the most supplementary information seeking of any participant, having conducted three searches independently, and

was much more selective of her information sources than the first participant, searching for sources that she recognized and trusted to form her perceptions. All three participants discussed having engaged in supplementary information seeking via smartphone while shopping in the past, though they also admitted that it was not a behaviour that happened all the time. This may be partially attributable to the fact that, as health conscious consumers with a relatively high degree of nutrition knowledge, they engage in healthier shopping and food consumption behaviour than the average consumer. Perhaps the most likely to engage in this behaviour frequently would be the second participant, due to her Celiac disease. Having all studied the information sciences, we might have expected to observe more consistency in the information seeking practices of these participants; instead, it is apparent that these supplementary nutrition information seeking behaviours may be more complicated and, just like food choices, dependent on a combination of several contextual and situational factors.

6.4. Discussion of Phase 2 Results

Having relied on a small sample size, this research was exploratory in nature. The nutrition information behaviour described throughout this chapter is not necessarily representative of the average consumer, but instead a health-conscious sub-sample of the original Phase 1 sample with a relatively high level of nutrition knowledge. The most significant trends in nutrition information behaviours demonstrated by this sub-sample have been described in the previous sections of this chapter, relying heavily on Furst et al. (1996) as a conceptual framework for the thematic coding and analysis of the qualitative data collected during Phase 2. The remainder of this section will be devoted to the consideration of the Phase 2 findings in relation to the original research questions that inspired this project (see Research Questions, Section 1.2).

Much of this chapter has already been dedicated to answering the primary research question: **how do consumers use ingredient information when making food purchase decisions?** From the data collected from Phase 2 participants, an array of nutrition information behaviours that rely on ingredient information have been observed. Two

general types of *Personal Systems* dependent on ingredient information were identified: a) trigger-focused *Personal Systems* that are designed to avoid of specific triggers of allergens, intolerances, and sensitivities, and b) ideal-focused *Personal Systems* that focus on achieving some food-related ideals by avoiding negative food attributes. Within these two types of *Personal Systems*, several *Value Negotiations* that used ingredient information were observed, broadly categorized into two groups: a) those related to the specific ingredients contained in a product, and b) those related to the physical nature of a list of ingredients. Both types of *Value Negotiations* were used to make inferences about the food product to determine whether or not it should be purchased and consumed. In addition to these *Value Negotiations*, participants also used a variety of established *Strategies* that were used to quickly evaluate a product without considering all the information on a food label. Interestingly, there was a great deal of consistency between the trigger-focused *Personal Systems* of the two participants who had been diagnosed with Celiac disease, while those with ideal-focused *Personal Systems* displayed much more variability, but generally focused on the avoidance of negatives in the effort to achieve their food-related ideals. While those who employ trigger-focused *Personal Systems* may also incorporate ideal-focused measures, the avoidance of triggers appeared to take precedence over any other consideration for the trigger-focused participants. Certain ideal-focused *Personal Systems* may also have food-related considerations that takes precedence over any other; for example, a vegan consumer may be equally dedicated to the absolute avoidance of any foods with animal-based ingredients. While there were no vegan participants completed Phase 2 of this study, future research could elaborate on the findings of this study by examining other types of consumer that were not included in this sample.

An interesting complication that also warrants future research is the role exceptions to the *Personal System*. While several ideal-focused participants admitted to making exceptions to their *Personal Systems*, trigger-focused consumers appeared to be less willing to take unnecessary risks and did not mention exceptions. While one might reason that trigger-focused consumers could make exceptions to the ideal-focused considerations of their *Personal Systems*, they did not appear willing to compromise trigger-focused considerations. However, depending on the disposition of the individual and the perceived

consequence of consuming a trigger, trigger-focused consumers with mild allergies or intolerances may be willing to make exceptions to their *Personal Systems* – just as committed ideal-focused consumers might be absolutely unwilling to make exceptions to their ideal-focused *Personal Systems*. Arguably, while the trigger-focused consumer is bound to a trigger-focused *Personal System* by the physical consequences of the trigger, the ideal-focused *Personal System* could be compromised without physical consequence. Therefore, the likelihood of compromising the *Personal System* with an exception may depend on the perception of these consequences.

Apparent throughout Phase 2 data, regardless of the type of *Personal System* applied, was the theme of avoidance, informing a sub-question of Research Question 1 (A) (see Section 1.2): **do** [consumers] **look for the presence or the absence of certain ingredients?** While there were instances in which participants sought positive ingredients, participants frequently used ingredient information to identify and avoid ingredients that they perceived to be negative. Some of the most interesting and valuable findings of this study relate to this perception of negativity and how consumers evaluate the negativity of ingredients. Due to the complexity of modern food production practices and the sheer number of possible ingredients within the average Canadian supermarket (Dixon, 2007), it is unrealistic to expect the average consumer to commit to memory the nature of all possible ingredients. To compensate, Phase 2 participants tended to evaluate ingredients on the fly, often making assumptions about the nature of those ingredients based on perceptions of the listed name of the ingredient. Participants consistently referred to ingredients that were perceived as *natural*, *common*, *whole*, *organic*, *real*, and *simple* positively, and referred to those perceived to be *additives*, *artificial*, *processed*, *modified*, *genetic modification*, and *preservatives* negatively. Some participants avoid ingredients, types of ingredients, or types of food entirely, which may greatly increase efficiency, but can also limit food-shopping options and participation in certain contextual circumstances, like social gatherings with those who do not share the same dietary practices. There appeared to be many cases where the exact nature of an ingredient was, to varying degrees, unknown and described by participants as such, as chemical sounding, or as difficult-to-pronounce. Some participants automatically perceived these unknown ingredients as

negative, relying on heuristic *Strategies* of avoidance to simply eliminate the risk of consuming a negative ingredient by adopting a general practice of abstaining from the consumption of unknown, difficult-to-pronounce, or 'chemical-sounding' ingredients. An alternative to the absolute avoidance of unknown ingredients, several participants described supplementary information-seeking behaviours used to determine the nature of the unknown.

Multiple forms of supplementary information-seeking behaviours in reaction to unknown ingredients were reported by Phase 2 participants, informing Research Question 2 (see Section 1.2) – **what types of information seeking behaviour are prompted by the list of ingredients?** Several participants reported searching for nutrition information regularly at home, both actively and passively. Those who are generally interested about nutrition may simple read recreationally, or subscribe to YouTube channels and Internet blogs. Others described active searches for nutrition information related to an unknown ingredient while at home after having purchased a product with an unknown ingredient. Unlike searching for information while shopping in a supermarket, searching for information at home is comparatively free from time restrictions and the observation of other shoppers, perhaps making it more desirable under certain circumstances.

Another reported type of information-seeking behaviour prompted by the list of ingredients was reliant on a personal contact—either a family member or a friend—considered to be an authoritative source of nutrition information. Several participants indicated having a contact that they had contacted via smartphone upon encountering an unknown ingredient when shopping in the supermarket. Presumably, this sort of behaviour would depend both on having such a contact and being comfortable enough to engage the contact in such a manner, as well as being invested enough in the decision to warrant seeking consultation. Those who described having engaged in this behaviour did not indicate that it occurred regularly; rather, it may occur once in a while, depending on the circumstance and the relationship.

Contacting a personal relation is one way to use smartphone technology to determine the nature of an unknown ingredient while shopping in the supermarket. This

reported behaviour partially informed a sub-question of Research Question 2 (see Section 1.2), concerning the nature of ingredient information use: **do** [consumers] **conduct any form of supplementary information seeking behaviour in the supermarket to determine the nature of an unknown ingredient?** Another way to use smartphone technology when making food choices is to use the mobile Internet browser to search for information about an unknown ingredient. This supplementary nutrition information seeking via mobile device was hypothesized to be an increasingly prevalent behaviour given the proliferation of smartphone technology, which has increased the individual's capability to satisfy an information need upon encountering a gap in knowledge. As reported through the NIU Survey, 8 of the 11 Phase 2 participants indicated having previously engaged in this supplementary information seeking via smartphone, though it was revealed in Phase 2 that several of these participants had only performed this behaviour once or twice. Alternatively, several others indicated having engaged in this behaviour more frequently – both those employing trigger-focused and ideal-focused *Personal Systems*. However, it has become apparent that these instances of supplementary nutrition information seeking could be dependent on various contextual factors, the time available, and one's investment in the decision. For trigger-focused consumers this supplementary information seeking may occur more frequently out of necessity, though no measure of frequency was incorporated into this study. It was apparent that while Phase 2 participants employing trigger-focused *Personal Systems* had to either determine the nature of the unknown ingredient, return the product to the aisle shelf upon identifying an unknown ingredient, or risk illness from consuming the unknown ingredient, while those with ideal-focused *Personal Systems* had the freedom to choose their level of investment and to abstain from searching for supplementary nutrition information with no direct physical risk. The decision to engage in supplementary information seeking can also depend on the number of unknown ingredients and on the type of food product, as well as on temporal and environmental factors. Interestingly, regardless of the motivation behind this supplementary information seeking behaviour, when asked to complete the Mobile Internet Search Task component of the Simulated Shopping Task, participants demonstrated both

types of *Personal Systems* engaged in information-seeking behaviours via smartphone with several consistencies.

In conclusion, the supplementary information-seeking behaviours prompted by unknown ingredients were often brief, relying on one or two sources to form a basic perception of the unknown ingredient in relation to the individual's food-related concerns, without committing too much time or energy. When a participant formed this perception, the previously unknown ingredient was then evaluated as a *Value Negotiation* along with any others in that *Personal System*, allowing the individual to make a purchase decision about the product. Those with trigger-focused *Personal Systems* might be more likely to invest time into this supplementary information seeking than those with ideal-focused *Personal Systems*, as the potential risk for the former group is physical illness; alternatively, the latter group risks compromising their food-related ideals, but would not suffer direct physical consequences from the experience. As the goal is simply to determine the nature of the unknown ingredient and to consider it within the established *Personal System*, consumers' investment in the process appears to be relatively low, and a quick assessment of information from one or two online information sources could be enough to form a perception of the unknown ingredient in order to consider it among the most important *Value Negotiations* of the individual's *Personal System*. As there are several alternative *Strategies* that could be implemented upon encountering an unknown ingredient, such as refusing to buy a product that contains any unknown ingredients, it became apparent that in-store supplementary information seeking might only occur in certain circumstances under specific conditions, which could be dependent on the information seeking tendencies of the individual, as described by Savolainen (1995) and presented in his model of ELIS (see Section 2.2).

Chapter 7

SYNTHESIS OF FINDINGS

7. OVERVIEW

This chapter provides a synthesis of the findings this thesis in relation to the research questions laid out in Section 2.1 and the established body of research related to the use of food label information. Section 7.1 considers the findings related to Research Question 1, beginning by confirming an important assumption: that consumers actually use ingredient information when making food choices (see Section 7.1.1). The remainder of Section 7.1 considers the findings related to how ingredient information is used compared to the findings of research related to how the food label in general is used by consumers (see Section 7.1.2). Section 7.2 considers the findings of this study in relation to what is known about the supplementary searching for information while shopping, and specifically that performed using mobile technologies. Section 7.3 concludes the chapter with a summary of this synthesis.

7.1. RESEARCH QUESTION 1

How do consumers use ingredient information when making food purchase decisions?

(A) Do they look for the presence or the absence of certain ingredients?

(B) How do consumers react to foods with unknown or unfamiliar ingredients?

7.1.1. CONFIRMING THE USE OF INGREDIENT INFORMATION

In pursuing this research project, one fundamental assumption was made about consumers' use of food label information: *that consumers use ingredient list information when making food purchase decisions.* However, this assumption was not made without evidence. For one, the principal investigator is an avid food label information user who relies heavily on ingredient information to make food choices. More importantly, several large-scale quantitative studies have found that consumers have reported that the list of

ingredients is one of the most important components of the food label (Canadian Council of Food and Nutrition, 2008; Ollberding et al., 2011). Despite these findings, there has been little research dedicated toward exploring the various ways that consumers use ingredient information when making food purchase decisions.

One of the primary objectives of the NIU Survey was to establish that those who completed Phase 1 of the study actually used ingredient information. To accomplish this, the same measure used by the Canadian Council of Food and Nutrition (2008) in the *TNT VII* survey was incorporated as Question 23 of the NIU Survey. According to the findings published in *TNT VII*, upwards of 80% of the Canadian participants, when looking at food labels, look for ingredient information on food labels – more than any other component of the food label (Canadian Council of Food and Nutrition, 2008). The NIU Survey results suggest that many consumers *usually look at* the list of ingredients with 73% of participants (n=380) having confirmed that they do usually look at the list of ingredients, though both the Nutrition Facts table and the 'Best before' date were selected by 82% of participants (n=415). According to the *TNT VII* report, fewer participants indicated usually looking at both the 'Best before' date and the Nutrition Facts table, selected by 74% and 71% of participants respectively. Alternatively, a large-scale American study reported that a notably lower proportion of a large sample of 5,502 consumers used these essential food label components, reporting that around 52% of participants indicated using the list of ingredients "at least sometimes" during food purchase decisions, while around 62% of participants indicated using the Nutrition Facts table (Ollberding et al., 2011). Although these figures from Ollberding et al. (2011) are comparatively lower than the Canadian studies, they should all perhaps be considered with a degree of skepticism as a number of qualitative studies have proposed that actual food label information use may actually be much lower than most self-reported figures suggest (Higginson et al., 2002; Balasubramanian & Cole, 2002; Grunert, Wills, & Fernández-Celemín, 2010; Graham & Jeffery, 2011). One of the problems with relying on surveys to measure the self-reported past behaviours of participants is the potential for misrepresentation, both accidental and intentional, from participants (Graham, Orquin, & Visschers, 2012). It has long been noted that social desirability bias can affect the self-reporting of an individuals' past nutrition-

related behaviours (Smith, Taylor, & Stevens, 2000) – and is perhaps characteristic of the self-reporting of health-related behaviours in general (Sutton, 2004). Therefore, while up to 73% of Phase 1 participants may use ingredient information to varying degrees, Question 23 of the NIU Survey can do no more than extend this quantitative, though perhaps over-reported, trend in food label information use.

A factor contributing to this over-reporting could be the vagueness of the questions that have been used to measure the prevalence of ingredient information use. For example, the *TNT VII* survey asked participants, "When you are looking at the label which of the following do you look for," prompting the respondent with a comprehensive list of the essential components of the food label (Canadian Council of Food and Nutrition, 2008). Perhaps slightly more direct as it was quantified with *usually*, the NIU Survey asked participants: *when you are looking at a food label, which sections do you usually look at?* Even more effective, Ollberding et al. (2011) quantified the frequency of these nutrition information behaviours with options like 'at least sometimes'– a relatively subjective measure, but perhaps more representative of actual behaviour than the TNT surveys. Regardless, none of these major quantitative studies have prompted participants to indicate the relative importance of the list of ingredients compared to the other essential components of the food label. A follow-up question to Question 23 of the NIU Survey had participants rank the importance of the list of ingredients compared to 7 other components of the food label (see Question 24, Appendix A). The results of this question proved interesting and are perhaps more reflective of the actual likelihood ingredient information use. The n=156 participants who considered the list of ingredients to be the 'Most Important (1)' component of the food label affecting their purchase decisions are perhaps more likely to actually use it than those who ranked it the second most important factor (n=111). Those who, in turn, ranked the list of ingredients as the second most important factor are perhaps more likely to use it than those who ranked it the third most important factor, and so forth. Based on the average rank attributed to the list of ingredients, the third highest overall, it is apparent that the list of ingredients was considered to be one of the three most important components of the food label to Phase 1 participants. As the top three ranked components received significantly higher average ranks of importance than the five

lesser-ranked components, we might also assume that they are the three most used components of the food label as well – though the actual nature and frequency of this use has yet to be determined, and likely varies per individual consumer.

7.1.2. How do consumers use ingredient information?

Having determined that the list of ingredients is used, to varying degrees, by some segment of the Phase 1 population, the primary Research Question motivating this project can now be addressed: **how do consumers use ingredient information when making food purchase decisions?** The NIU Survey results, reinforced by qualitative findings derived from the Phase 2 data, have informed this question by confirming the extension of past findings related to food label use to ingredient information, all the while exploring new aspects of food label use by focusing on the use of ingredient information. To address this research question in relation to the established body of research, let us consider the two types of *Personal Systems* reliant on ingredient information that were identified in the data collected during Phase 2 (see Section 6.3.1): 1) trigger-focused *Personal Systems* and 2) ideal-focused *Personal Systems*.

These two distinct types of *Personal Systems* can vary in focus and intensity, though trigger-focused participants appeared to be more constant, and ideal-focused participants were more variable in their exhibited behaviours. Given the immediate physical consequence of illness, the stress and stakes associated with food choices are higher for those with trigger-focused concerns like allergies, prompting a greater need for nutrition information (Cummings, Knibb, King, & Lucas, 2010; Barnett et al., 2013). Apparent in their Phase 2 testimonies, the information needs of trigger-focused consumers were motivated by an intense physical need to avoid illness or discomfort, prompting a systematic and vigilant use of food label information, which is consistent with Visschers et al.'s (2010) proposition that a greater health motivation inspires more intense food label use. In order to ensure the absence of triggers, trigger-focused participants demonstrated *Personal Systems* that incorporated similar systematic *Strategies* that relied on ingredient information to make food choices (see Section 6.3.3). Trigger-focused participants would

first check the 'Contains…' statement for a trigger and, when no triggers were mentioned in the 'Contains…' statement, they would read back through the list of ingredients to check for the presence of triggers. This behaviour is consistent with that observed by Barnett et al. (2011b), who found that while trigger-focused consumers used the 'Contains…' or 'May contain…' statements, they did not consider this information trustworthy, and supplemented this usage with additional strategies. The *Strategies* of trigger-focused *Personal Systems* that depended on ingredient information were combined with other *Strategies*, either dependent on some other aspect of the labelling, such as front-of-package Celiac Association logos (or, alternatively, a wheat-related logo), or unrelated to food labelling, such as habitual purchasing of products based on past experiences. The use of these types of strategies confirms Graham and Jeffery's (2011) hypothesis that consumers consider more information on products that they ultimately purchase than those they do not – especially if when a trigger-focused *Personal System* that follows a very rigid protocol is employed, as each step in the process must confirm the absence of the trigger in order to move on to the next step, and only when all steps have confirmed the absence of the trigger can the food choice be made. These findings are complementary to Barnett et al. (2013), who identified several food choice strategies used by trigger-focused participants that were independent of food label information, several of which were cited by Phase 2 participants, including the habitual purchasing of products and brand preference based on past experiences. While trigger-focused participants mentioned a variety of *Strategies* used to avoid triggers, their dependence on ingredient information was apparent throughout their completion of the simulated shopping task.

Despite these systematic *Strategies*, trigger-focused participants still expressed a lack of trust in food label information that results in the preference for home cooking and habitual purchasing, stating that past experience has led to this lack of trust. While remarking that the labelling of triggers has improved in recent years, trigger-focused participants were skeptical of ingredient information, citing mislabelling and cross-contamination as reasons behind this skepticism. The identification of triggers in food products is difficult enough using food label information, though the plight of the trigger-focused consumer is rendered even more complicated by the reality that some triggers may

be unavoidable (Cummings et al., 2010). Regardless of this lack of trust in food labelling, trigger-focused consumers have no choice but to rely on ingredient information or abstain from purchasing pre-packaged food products altogether. This is perhaps the most interesting difference between the trigger-focused and ideal-focused *Personal Systems*, as those employing trigger-focused *Personal Systems* cannot make exceptions to these systematic protocol without risking the physical consequence of consuming the trigger, whereas those utilizing ideal-focused *Personal Systems* have more freedom to make exceptions and abstain from using food label information whenever desirable, such as upon the decision to pursue hedonic satisfaction through the consumption of a product that might otherwise be refused by the individual's ideal-focused *Personal Systems*.

While trigger-focused participants engaged in specific, standardized preliminary *Strategies* in order to determine whether or not a food contained any triggers, they also described utilizing additional *Strategies* that were not associated with triggers, but concerned other food-related factors (see Section 6.3.2 & 6.3.3). As opposed to the trigger-focused *Strategies*, these other *Value Negotiations* and *Strategies* are voluntarily incorporated into the individuals' *Personal Systems* (see Section 6.3.3). Consistent within both types of *Personal System* was the theme of avoidance – both trigger-focused and ideal-focused consumers tended to use ingredient information to avoid negatives, instead of identify positives. This tendency to focus on the negative attributes of food has been confirmed repeatedly (Worsley, 1996; Burton et al., 1999; Balasubramanian & Cole, 2002; Miller & Cassady, 2012). The findings of this study confirm the extension of this behaviour to the use of ingredient information, as this had not yet been confirmed in past research. The *TNT VII* survey reported that a *common* use of food label information was to check *whether the food contains a specific ingredient* – with 69% of Canadian participants responding either 'Often' or 'Sometimes', with 32% having selected 'Often' (Canadian Council of Food and Nutrition, 2008). Similar findings emerged in the Phase 1 data; however, the nature of the inquiry differed. Question 25 of the NIU Survey asked participants if they had *ever looked at an ingredient list to make sure a particular ingredient was contained in a product you were considering purchasing* – approximately 55% of the population indicated that they had. Question 26 of the NIU Survey asked the

opposite, if participants had ever *looked to make sure a particular ingredient was not contained in a product* – to which 86.5% of participants indicated that they had. While self-reported food label use is generally considered to be over-reported, the notable difference in participants' responses to these two questions suggests that consumers do focus more attention to negatives than positives when processing ingredient information. This tendency was also reflected in Phase 2, as participants consistently focused more on negative attributes than positive, with far fewer references to positive ingredients. While this focus on the negative is quite interesting, perhaps one of the most relevant contributions of this study to the understanding of food label information use relates to consumers' perceptions of negativity, as well as how they determine negativity on the fly while shopping for foods.

As described in Chapter 6 (see Section 6.3), Phase 2 participants were constantly engaged in *Value Negotiations* related to the content of the foods that they were asked to consider purchasing – and in most circumstances these participants focused on the negative elements of these products, examining both the Nutrition Facts table and the list of ingredients to identify negative elements. Interestingly, it was not necessarily specific ingredients with which participants were concerned, but abstract categories related to the nature of these ingredients. Several participants expressed a general preference for *natural*, *whole*, *organic*, *real*, and *simple* ingredients, and expressed a general aversion to *additives*, *artificial*, *processed*, *modified*, and *genetically modified*, preferring to avoid these negative types of ingredients (see Section 6.3.2). This is consistent with Buchler et al.'s (2010) study on consumer perceptions of food risks, which found that consumers are generally more concerned with modern food risks like additives and government regulations than traditional risks like contamination.

Food additives were of particular interest because of the relative ambiguity of the term. As mentioned earlier in Chapter 5 (see Section 5.4), a food additive is literally any chemical substance used in food to "…maintain its nutritive quality, enhance its keeping quality, make it attractive or to aid in its processing, packaging or storage" (Health Canada, 2013). In addition, additives are essential to modern food production; without additives, the global food production system and modern supermarket would be drastically different than that which Canadians currently rely upon (Bearth, Cousin, & Siegrist, 2014). Despite this

necessity, food additives were generally perceived to be negative in nature by Phase 1 and Phase 2 participants. Similar to the aforementioned tendency to focus on the negative components of food, Bearth et al. (2014) found that consumers also focused on the potential risks of food additives over the benefits they provide. Responses to Question 22 of the NIU Survey suggest that many participants were hesitant to wholly dismiss food additives as negative – reflected in the cluster surrounding 'Neutral (4)', as approximately 61% of respondents selecting responses within the range of 'Somewhat Disagree (3)' to 'Somewhat Agree (5)'. However, an overall tendency to avoid food additives was expressed by Phase 1 participants, as approximately 54% of the sample agreed with the statement *I try to avoid foods that contain additives*. While the relative degree of neutrality shown in participants' responses may be attributable to the wide range of positive to negative additives that could be contained in a pre-packaged food product, the contrasting dismissal may be attributable to a lack of understanding regarding the nature and purpose of specific additives. This is consistent with Buchler et al. (2010), who found a general tendency for consumers to automatically perceive additives as negative with little understanding of their nature or purpose. Several studies have found evidence to suggest that while natural foods are generally perceived to be healthy, processed foods are often associated with health risks (Evans, de Challemaison, & Cox, 2010; Hauser, Jonas, Riemann, 2011; Rozin, Fischler, & Shields-Argeles, 2012). Consumers' tendency to avoid additives may be attributable to this general aversion to processed foods, as Varela and Fiszman (2013) found that negative perceptions of food additives often had to do with the assumption that these additives were artificial. Evans et al. (2010) found that even a small amount of food additive has a significant effect on consumer perceptions of naturalness. However, Bearth et al. (2014) notes that consumers are not necessarily equipped with the knowledge or resources to properly gauge these risks, employing appraisal strategies that differ from those used by experts. One of the more interesting findings of this study relates to the various heuristic *Strategies* that were employed by participants to quickly evaluate products based on perceptions of ingredients like additives and preservatives, as well as the criteria used to make these evaluations.

Several *Strategies* that relied on ingredient information were employed to avoid negative food-related attributes during Phase 2 of the study. Comparison was one of the most commonly observed *Strategies* used to avoid a negative ingredients – which is logical given that the nature of the modern food label encourages comparison by consistently providing the same fields of information in a standardized format (Balasubramanian & Cole, 2002; Visschers et al., 2013). One of these *Strategies* consisted of scanning the "first few" or primary ingredients listed in the list of ingredients instead of considering the entire list, in order to ensure that no overly negative ingredient comprised a significant proportion of the food. This was consistent with the findings of a recent study that utilized eye-tracking technology to determine what components of the food label were used to inform the food choices of Uruguayan participants in two simulated shopping tasks (Ares, Giménez, Bruzzone, Vidal, Antúnez, & Maiche, 2013). Ares et al. (2013) found that consumers general scan labels for specific information, and focusing primarily on these select pieces of information; they also found that the list of ingredients was, on average, the third component of the food label to be examined, after brand and the image of the label, and that it was examined for longer than any other component of the label. Whether just the first few ingredients are scanned or the whole list, participants consistently looked for negatives in the list of ingredients.

Some participants compared ingredient information looking for the product that contained fewer negative ingredients, which would be considered a compensatory strategy in which several factors from a given label are considered simultaneously (Miller & Cassady, 2012). Both compensatory and noncompensatory strategies were used to compare ingredient information, which was consistent with Miller and Cassady's (2012) conclusion about the strategies used to evaluate the Nutrition Facts table. Some Phase 2 participants considered the position of a particular ingredient in either label; other participants compared the first ingredient listed in several food label, followed by the second ingredient in each label, etc. Both of these forms of comparison would be considered noncompensatory strategies. Phase 2 participants seemed to consider several ingredients from a single list of ingredients simultaneously, focusing mostly on negative ingredients (see Section 6.3.2), which would qualify as a compensatory strategy (Miller & Cassady,

2012). A similar strategy that was also used by some participants related to the length of the list of ingredients or the number of ingredients, with the assumption that more ingredients equates to negativity, which could also be argued a compensatory strategy. As consumers tend to focus on the negative attributes of products, compensatory strategies can be applied to the ingredient when determining which product possesses fewer negatives. Burton and Andrews' (1996) remarked that the modern food label is more useful for determining that a product is unhealthy rather than healthy, which appears to be particularly relevant when considering these compensatory and noncompensatory strategies. One might argue that the nature of the list of ingredients encourages compensatory strategies, though future research would be necessary to reach such a conclusion. In order for a noncompensatory strategy to be effective, the lists of ingredients that were compared would have to be similar quite similar, such as those of the cereals used in Phase 2; alternatively, products with significant differences in ingredient information may demand compensatory strategies to make a food choice (see Appendix L for the lists of ingredients of products used during Phase 2). Interestingly, the trigger-related considerations of allergic participants were neither compensatory nor noncompensatory, focusing on the list of ingredients of each product independently to ensure the absence of triggers before a given product could be considered for purchase; after determining a product was acceptable, comparison between acceptable products would likely occur.

Several of these *Strategies* were used to evaluate ingredients that were assumed to be additives and preservatives, forming perceptions of these ingredients on the fly while completing the simulated shopping task. Some of these heuristic *Strategies* were dependent on perceptions that were based on qualities of the listed name of an ingredient, as several participants citing the avoidance of difficult-to-pronounce and 'chemical-sounding' ingredients. These findings are consistent with those of Song & Schwarz (2009), who found that food additives that are more difficult to pronounce are generally perceived to be more harmful. Additionally, Evans et al. (2010) found that consumers perceived chemical names to be less natural than common names for the same ingredient, while Dickson-Spillmann, Siegrist, and Keller (2011) found that many consumers prefer to avoid foods that contain chemicals. However, the reality may be that consumers in general are lacking

knowledge when it comes to food additives and preservatives (Varela & Fiszman, 2013). This was apparent in the testimonies of participants who, when referring to these difficult-to-pronounce and 'chemical-sounding' ingredients, seemed to not know the exact nature of these ingredients, but presumed them to be negative. Song & Schwarz (2009) noted that these negative perceptions could be mediated by familiarity; therefore, an unknown ingredient that is difficult to pronounce is perceived more negatively than a familiar ingredient that is difficult to pronounce. Past research has suggested that consumers' generally perceive greater risk in foods and food production processes that are unknown, as well as perceive less risk in familiar foods (Grunert, 2006). This was most apparent in the testimony of Participant C—a PhD student with a background in Chemistry—who seemed quite knowledgeable about preservatives, having worked in lab settings throughout his academic career. Whereas most participants were wary of preservatives, or anything that sounded like a preservative, Participant C understood the nature of these compounds, expressing confidence that they were harmless.

As mentioned earlier in Chapter 6 (see Section 6.3.2), difficult-to-pronounce and 'chemical sounding' ingredients may simply be ways to classify unknown ingredients based on the language used to represent them. In general, participants tended to assume that these unknown ingredients were unnatural. Evans et al. (2010) performed an interesting experiment comparing novel ingredients and common ingredients in a study on consumers' perceptions of food additives, with the hypothesis that novel ingredients would be perceived more negatively than common ingredients. However, novel ingredients like 'fruit powder' and 'black carrot' were perceived to be more natural than common ingredients like pectin, starch, and gum – even though these common ingredients are derived from natural sources (Evans et al., 2010). These findings suggest that the language used to describe ingredients can affect consumer perceptions, but also that consumers' understanding of common, naturally derived ingredients may be limited (Evans et al., 2010). These findings may be partially attributable to the ingredients and language measured by Evans et al. (2010), but it still highlights the importance of the language used to represent the ingredients listed on food labels. The implications of Evans et al. (2010) resonate in Phase 2 of this study; one particular example from Phase 2 that exemplified this phenomenon

were perceptions of Tocopherols, which several participants perceived to be negative before discovering that Tocopherols are a form of Vitamin E found naturally in all sorts of foods while completing Step 6 of the simulated shopping task (see Appendix B).

As noted by Cohen and Babey (2012), an over-reliance on any one heuristic strategy can result in systematic errors and suboptimal food choices. While it could be argued that some *Strategies* could lead to suboptimal food choices, such as the avoidance of any 'chemical' ingredient, as discussed in the last chapter (see Section 6.3.2), it would be equally difficult to argue that some of these *Strategies* are not effective in eliminating many negative food options from consideration, even if some foods are unnecessarily avoided. Therefore, while these *Strategies* may not be perfect, they could also be an effective way to make food choices without investing too much time refining nutrition knowledge to the extent that the nature of every ingredient is known. The overall preference for natural, whole foods observed throughout Phase 2 may be effectively served in the application of these strategies, as some consumers appear to have little tolerance for processed food, regardless of declarations of safety from nutrition professionals (Varela & Fiszman, 2013). Based on the survey results collected in Phase 1 of the study, approximately a third of participants indicated having not purchased a food product because of an unknown ingredient that was difficult to pronounce, suggesting that this may be a commonly employed strategy.

Another interesting phenomenon observed in this study was the application of heuristics to make purchase decisions. Furst et al. (1996) briefly considered the importance of heuristics as shortcuts to help facilitate the making of food choices, labelling them *Strategies* in their model. These heuristic practices were observed in both trigger-focused and ideal-focused *Personal Systems* described by Phase 2 participants. Within these *Personal Systems*, heuristic practices related to the use of ingredient information appeared to rely on a few select pieces of information, related to the most important information needs of the individual (Scheibehenne et al., 2007). In both cases, these heuristic practices appear to be employed as preliminary screening tools used to determine whether or not a product should be further considered, helping to ensure that the product meets the most essential concerns of the consumer. The heuristic *Strategies* used by the few participants

employing trigger-focused *Personal Systems* were relatively consistent in nature, searching several pre-determined places on the food label in a particular order so as to efficiently determine whether or not a trigger was contained in a product (see Section 6.3.3). For example, these trigger-focused consumers used 'Contains…' and 'May contain…' statements as a quick way to eliminate products from consideration. However, when a food label does not have 'Contains…' and 'May contain…' statements, or does not highlight a trigger within those statements, these consumers reviewed the list of ingredients to ensure the absence of triggers, citing a lack of confidence in trigger-related labelling. This absence of trust in trigger-related labelling is consistent with past research related to the food label use of trigger-focused consumers (Barnett et al., 2013). Barnett et al. (2011b) found that while some consumers with nut allergies used 'May contains…' statements, the majority of participants did not consider this form of labelling to be credible and relied on other strategies to avoid allergens.

Another interesting finding of this thesis relates to a phenomenon that was alluded to by Furst et al. (1996), but is arguably not properly accounted for in their Food Choice model. Due to the application of the Screening Tool to ensure that Phase 2 participants would be more likely ingredient information (see Section 4.3.2), those who completed Phase 2 were relatively health conscious consumers with higher levels of nutrition knowledge. However, several of these participants described certain circumstances in which they would not apply their *Personal Systems*, making food choices without considering any food label information. Furst et al. (1996) alluded to this phenomenon, suggesting that contextual factors like *Social Framework* (the influence of others) and *Food Context* (in what setting food choice is made) could affect isolated food choices, but overall this phenomenon of exceptions was not given much attention in the work. Phase 2 participants cited convenience, hedonic pleasure, and social circumstance as possible reasons for making exceptions, consistent with the findings of Wahlich et al. (2013). While abstaining completely from considering food label information does not appear likely for those employing trigger-focused *Personal Systems*, they could reasonably abstain from any considerations unrelated to these triggers. Some of the most health conscious participants that completed Phase 2 referred to occasional exceptions, ranging from the consumption of

soda, but only to mix it with alcohol, to the purchase of a frozen pizza for occasional convenience. Such exceptions could be the cause of the aforementioned discrepancy between self-reported food label use and the label use measured with objective measures like in-store observation and eye-tracking technologies (see Section 4.1). Future research could address this discrepancy by focusing on the role of exceptions in food choices.

7.2. RESEARCH QUESTION 2

Research Question 2 is closely tied to Research Question 1 (B), as supplementary information seeking behaviour related to ingredient information would likely be prompted by an unknown ingredient, or else by some unknown quality related the nature of an ingredient. Research Question 2 asked: **what types of supplementary information seeking behaviours are prompted by the list of ingredients?** Given that modern food production has become increasingly complex with technological developments and global trade, understanding the content of foods and the nature of every ingredient that could be found in the supermarket would be a challenge to the average consumer (Dixon, 2007). Upon encountering an unknown ingredient listed on a food label the consumer can react in several different ways, as shown in the multiple-choice responses to NIU Survey Question 28, which asked participants to indicate how they have reacted to unknown ingredients listed on food labels in the past (see Appendix A). As discussed earlier in Chapter 5 (see Sections 5.2 & 5.3), the second most popular response to Question 28 was 'Used my smartphone to look up the ingredient in the store', which was selected by 44% of the Phase 1 participants[5] (n=228), while the third most popular response was 'Bought it, but looked up the ingredient online later', selected by 40% of Phase 1 participants (n=206). This reliance on the Internet as a source of nutrition information could have been predicted, given the demographic characteristics of the sample. As a young, highly educated cohort, this sample may have drawn heavily from Visschers et al.'s (2013) the *Internet Users*

[5] Two questions inquired about the use of a smartphone to search for information about an unknown ingredient while shopping in the supermarket, the first (Question 28) as one of several multiple-choice responses, and the second (Question 29) asked about this behaviour directly – an additional n=53 participants, totaling n=281, indicated having performed this behaviour in the past when asked about it directly, which may be inflated given the tendency to over-report nutrition-related behaviours (Grunert, Wills, Fernández-Celemín, 2010).

segment, which was the youngest and most educated of segments, characterized by a heavy reliance on the Internet for nutrition information. This is part of a greater trend in nutrition information behaviour that extends to the Canadian consumer in general, as the progressive rise of the Internet as an important source of nutrition information to Canadian consumers has been tracked since 1996 by *TNT* surveys (Canadian Council of Food and Nutrition, 2009), as the Internet was recently confirmed to be the second most used source of nutrition information by Canadian consumers after the food label (Canadian Foundation for Dietetic Research, 2013). Phase 1 participants' responses to NIU Survey Questions 28 and 29 were consistent with this trend of reliance on the Internet as a source of nutrition information.

The research related to this aspect of food label information behaviour is limited, with no known studies having explored how consumers use smartphone technology to seek supplementary information while shopping in the supermarket. Lioutas (2014) listed several factors that influence the selection of an information source, including convenience, familiarity, perceived trustworthiness and credibility, availability, and accessibility. Having measured a younger cohort that has grown up alongside smartphone technology in a world that is increasingly dependent on the Internet for information, it is not surprising that a significant proportion of Phase 1 participants indicated having used a smartphone to search for an unknown ingredient in the past. Frewer et al. (1996) determined trust to be the most important factor affecting the consumer's choice in a source of nutrition information. Remember that Canadians participants of the *TNT VII* Survey considered the Internet to be a trustworthy source of nutrition information, as 43% of respondents rating the credibility of the Internet as either 4 or 5 out of 5 (Canadian Council of Food and Nutrition, 2008). Compared to other sources of nutrition information, the enhanced availability and accessibility of the Internet via smartphone make it a desirable source of nutrition information. Considering that a high percentage of Canadians possess smartphone technology, having reached 73% in 2014 (J. D. Power & Associates, 2014), the capacity to access nutrition information immediately upon recognizing a gap in nutrition knowledge has never been greater. Citing a Google conference, Breikss (2012) reported that upwards of 77% of Canadians have used their mobile phones to access the Internet while shopping.

Consistent with past research (Ostry et al., 2008), few participants accessed non-commercial, government websites when asked to search for supplementary nutrition information, while most consulted commercial websites while completing Phase 2 of the study (see Section 6.3.3). Consider also that all mobile Internet browsers used by Phase 2 participants automatically searched with Google, which inevitably affected the search results and Internet sources consulted. Having established in both phases of this study that supplementary information seeking does occur via smartphone while shopping in the supermarket, future research could be directed to understanding how often this behaviour occurs and if some consumer segments are more likely to engage in this behaviour than others. The Phase 2 data has suggested that this sort of behaviour may only occur rarely and under specific circumstances. Smartphone searching could depend on the consumer's predisposition toward ELIS behaviours, as discussed by Savolainen (1995). Consumers vary in both the capacity and motivation to satisfy everyday problems through information seeking behaviour (Savolainen, 1995). Depending on the intensity of the information needs of the individual consumer, information seeking via smartphone might be more likely when information needs are greater (Lioutas, 2014), such as for a trigger-focused consumer. More directed research is warranted to further explore which type of consumer is most likely to engage in this supplementary information seeking, and under which contexts it is more likely to occur.

7.3. SUMMARY OF SYNTHESIS

This chapter has synthesized the findings of thesis with the most relevant findings from past research with implications on research questions that framed this study (see Section 1.2). These findings have confirmed important assumptions that framed this research, extended findings from past research related to food label information use to the use of ingredient information, and discussed the findings in relation to technological trends that could affect food label use in the future. The quantitative results from this thesis confirmed that participants used the list of ingredient in a variety of ways and that participants considered it to be an important component of the food label that affects their food choices, confirming some essential assumptions that this project was founded upon. In

this effort to explore how consumers use the list of ingredients, the most significant finding of this thesis was the confirmation of one major trend that was found in several studies related to food label information use: that participants tended to use ingredient information to avoid negative food attributes (Balasubramanian & Cole, 2002).

Two distinct types of ingredient information user were identified using Furst et al. (1996) as a framework for thematic analysis; both relied on the list of ingredients in order to avoid negatives. The first type of user was trigger-focused, intending to avoid ingredients that were or could be triggers that would result in some immediate physical consequence of sickness or discomfort related to an allergy, sensitivity, or intolerance. The second type of user was ideal-focused, intending to avoid negative ingredients to achieve some food-related ideal, such as healthiness, a paleolithic diet, vegetarianism, religious practice, etc. Both types of user also relied on a variety of heuristic strategies to help make purchase decisions, and most of these strategies were intended to efficiently evaluate negatives attributes using ingredient information. Phase 2 participants exhibited both compensatory and noncompensatory strategies to make decisions, but it appeared as though the ingredient list encourage the making of compensatory strategies (Miller & Cassady, 2012). Some of the strategies involved assumptions that were made about 'chemical sounding' and difficult-to-pronounce ingredients, as well as additives, with little apparent understanding of the actual nature of these ingredients, which was also consistent with past research (Song & Schwarz, 2009; Dickson-Spillmann et al., 2011). These findings also had implications on how consumers react to unknown ingredients listed on food labels, as the *Strategies* employed in some *Personal Systems* were designed to eliminate products that had too many unknown ingredients.

The findings of this thesis could be argued consistent with a recent effort at consumer segmentation, as Visschers et al. (2013) identified a segment of young, educated consumers that are most likely to use the Internet to acquire nutrition information. The importance of the Internet as a source of nutrition information was apparent throughout the data in both phases. The quantitative data collected during Phase 1 suggested that supplementary information seeking in reaction to unknown ingredients listed on food labels could be prevalent among younger consumers; two of the most popular responses involved

using the Internet to satisfy these nutrition-related information needs. The importance of the Internet as a source of nutrition information was confirmed, as was the hypothesis of its use via smartphone to satisfy gaps in nutrition knowledge upon encountering unknown ingredients while shopping in the supermarket.

Chapter 8

CONCLUSION

8. OVERVIEW

This final chapter will briefly consider some of the important theoretical and practical implications that should be taken away from the findings of this thesis. Section 8.1 considers the theoretical implications of these findings on the study of information seeking behaviours, and specifically those related to the food choice process. The findings of this study warrant some refinement to Furst et al.'s (1996) model, which could effectively serve as a framework to consider how consumers use other aspects of the food label, given that the current understanding of these behaviours is limited. Section 8.2 considers the practical implications of these findings and how they might be used to design an app that could help consumers use ingredient information, providing recommendations that could be implemented by supermarkets and governments to improve the delivery of nutrition information to consumers. Section 8.3 considers the limitations of this research, followed by a brief conclusion in Section 8.4 and some recommendations for future research in Section 8.5.

8.1. THEORETICAL IMPLICATIONS

Throughout this thesis, consumers' use of ingredient list information on food labels has been examined from a perspective grounded in the study of information behaviour. The foundational models integrated into the theoretical framework of this thesis—Wilson (1997) and Savolainen (1995) (see Chapter 2, Figures 1 & 2)—have been essential in the conception of the food choice process. While this thesis will not recommend modifications to either of these models, these models have influenced the understanding and conception of Furst et al.'s (1996) model. Though this model appears linear in nature, it should be imagined more so as a perpetual series of food choices, with each food choice experience contributing to the context in which the ensuing food choice is made – just as Wilson's (1997) model is cyclical in nature, Furst et al.'s (1996) model could be conceived as a

continuous stack of food choice models. The incorporation of Savolainen's (1995) models was more so to emphasize the concept of the ELIS behaviour. Future research could consider the four types of 'mastery of life' information seeker proposed by Savolainen (1995) to determine whether this sort of segmentation can predict the likelihood and nature of engaging in supplementary nutrition information seeking via smartphone while shopping in the supermarket. An important feature of Savolainen's (1995) model of ELIS is the progressive accumulation of information through the 'mastery of life' process – however, while this accumulation of information and cultivation of nutrition knowledge must occur, it is interesting to consider the apparent tendency for Phase 2 participants to evaluate ingredients on the fly, forming perceptions that are based on assumptions about the nature of those ingredients. If certain types of individual are less likely to search for supplementary nutrition information, it may be worthwhile to determine the best way to communicate this valuable information to those segments of consumer. Though beyond the scope of this study, future research should consider the barriers preventing those who do not use ingredient information when making food choices.

The importance of context has been reflected in the wide range of food label-related behaviours measured in this mixed-method study, and in the factors motivating the use of the ingredient information in the various ways observed during Phase 2 of the study. Food label information is used to satisfy information needs, which are secondary needs associated with more essential primary needs (Wilson, 1999). The nature of the information seeking behaviour intended to satisfy a secondary information need depends heavily on the intensity of the primary need inspiring it (Visschers et al., 2010). This was best highlighted in the information seeking behaviours of trigger-focused participants, who adopted similar heuristic *Strategies* to avoid triggers by systematically considering certain information on each food label through a standardized *Personal System* (see Section 6.3.3). Due to the intensity of the physical need that motivates the food label use of these trigger-focused consumers—which could vary in intensity, depending on the physical consequences of the trigger and the personality of the consumer (Savolainen, 1995; Lioutas, 2014)—some trigger-focused consumers must strictly adhere to the continual application and refinement of their trigger-focused *Personal Systems* in order to consistently avoid triggers. Possessing

arguably the most intense health motivations of any of the participants who completed both phases of this study (see Section 3.1), these consumers faced the most significant consequences for failing to properly utilize their *Personal Systems* and appeared to be the most devoted users of ingredient information.

Introduced in Section 2.2, Furst et al.'s (1996) Food Choice model was used as a conceptual framework to structure the thematic analysis of qualitative data collected during Phase 2 (see Section 4.5.2). The findings from this qualitative data warrant the proposal of two modifications to Furst et al.'s (1996) Food Choice model. The first proposed modification relates to the difference in urgency between the trigger-focused *Personal Systems* and all other *Personal Systems*, both that utilize ingredient information and do not. Whereas many aspects of one's *Personal System* are voluntarily adopted based on food-related beliefs and concerns (Furst et al., 1996), the avoidance of triggers is not voluntary but necessary to avoid the physical consequences of the trigger on the trigger-focused consumer. Therefore, the trigger-focused consumer must employ the *Personal System*—or at least the preliminary *Strategies* used to ensure the absence of triggers—when making a food choice, or else risk suffering the health consequences of the trigger. This mandated behaviour contrasts with another proposed modification to Furst et al.'s (1996) Food Choice model, namely the possibility for consumers to abstain from any measures that have voluntarily been incorporated into a given *Personal System* due to circumstantial factors, such as the temporary desire to achieve hedonic satisfaction through food consumption (Wahlich et al., 2013). Both of these proposed modifications have been incorporated into a new Food Choice model, presented in Figure 5 below.

Note the position of the first proposed modification to Furst et al.'s (1996) Food Choice model. Allergy, sensitivities, and intolerances would fall under Furst et al.'s (1996) *Personal factors* on the Food Choice model, as contextual factors that affect every single purchase decision – with the assumption that the consequence of a trigger is serious enough to warrant constant consideration during food choices, such as those described by Phase 2 participants (see Section 6.3). As those employing a trigger-focused *Personal System* could also incorporate any other food-related consideration into their food choice processes, the possibility for the consideration of secondary factors has been indicated using the dual-

direction arrows, as any of these factors could also affect the food choice. However, the importance of the trigger-focused *Value Negotiations* and *Strategies* over all other considerations is reflected in the positioning of this modification to Furst et al.'s (1996) Food Choice model, which follows a linear path from the individual context—a combination of *Life Course* and *Influences*—through the *Personal System*. As suggested in the qualitative testimonies of Phase 2 participants employing trigger-focused *Personal Systems*, these trigger-focused considerations take precedence over any other consideration, but additional food-related considerations unrelated to these triggers are also considered. Furthermore, the possibility to make a food choice based strictly on these trigger-focused considerations is indicated by the parallel avenue toward choice along the left side of the model (see Figure 5).

The second proposed modification to Furst et al.'s (1996) Food Choice model can be observed on the opposite side of the modified model (see Figure 5), which is intended to indicate the possible circumvention of the *Personal System* with exceptions made in a given circumstance. Considering Furst et al.'s (1996) *Influences*, each has the potential to affect whether or not the individual were to make an exception and abstain from the *Personal System*. The two *Influences* furthest to the right, *Food Context* and *Social Framework*, are perhaps the two most likely to encourage the making of an exception (Furst et al., 1996), as determined through the qualitative findings derived from the Phase 2 data and supported the published findings of Wahlich et al. (2013). Wahlich et al. (2013) identified two types of circumstances where consumers admitted to ignoring food label information: 1) any instance where the individual is determined to make a food choice based on hedonic satisfaction and 2) specific social occasions, such as holidays, celebrations, or simply eating out at a restaurant. Both types of circumstance were mentioned during Phase 2 (see Section 6.3). Alternatively, the two *Influences* furthest to the left—*Personal Factors* and *Ideals*—could be strong enough to limit or eliminate the prospect of making any exceptions whatsoever.

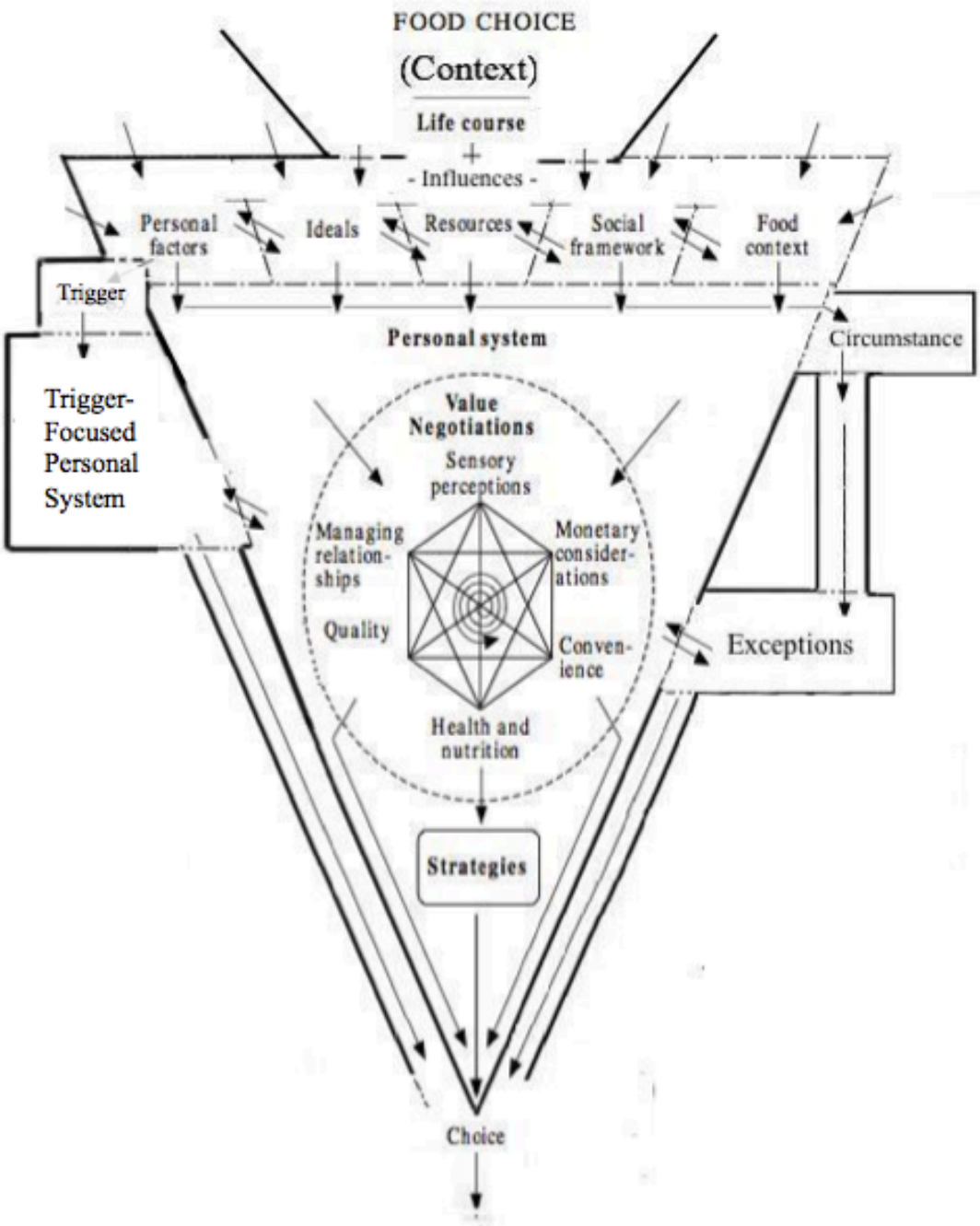


Figure 5: Modified Food Choice model

An exception could result in the circumvention of the whole personal system, or could simply involve compromising some aspects of the *Personal System* that are of lesser importance to the consumer. While trigger-focused consumers are bound to the trigger-focused considerations of their *Personal Systems*, they could make exceptions to any other

aspect of their personal system; alternatively, those employing ideal-focused *Personal Systems* could make an exception to any aspect of their personal system.

8.2. PRACTICAL IMPLICATIONS

In order to frame the practical implications of this study, a quick recap of some essential findings will prove useful for the reader.

1. Discussed in Section 7.1, many Phase 1 participants indicated using ingredient information to make purchase decisions; Phase 2 participants demonstrated a variety of ways that ingredient information can be used.
2. Two general types of ingredient information user were identified. One type focused on avoiding triggers of the physical consequences related to allergies, sensitivities, and intolerances; the other type focused on the achievement of food-related ideals, such as healthiness, vegetarianism, paleolithic, religious practices, etc.
3. Both types of user focused on the avoidance of negatives; perceptions of negative depended on various contextual factors, especially nutrition knowledge.
4. Many participants employed heuristic strategies to help increase the efficiency of food choices; some strategies, like avoiding difficult-to-pronounce or 'chemical sounding' ingredients, involved assumptions about the nature of ingredients, which may result in sub-optimal food choices (Cohen & Babey, 2012).
5. Past studies have found consumers automatically judge additives, difficult-to-pronounce (Song & Schwarz, 2009), and 'chemical sounding' ingredients (Evans et al., 2010; Dickson-Spillmann et al., 2011) negatively, while Varela and Fiszman (2013) found that consumers are lacking in knowledge about these types of ingredients.
6. Based on Phase 1 and Phase 2 data, consumers appear willing to use their smartphones to satisfy information needs related to unknown ingredients while shopping in the supermarket.

Therefore a smartphone app that could be personalized to reflect the avoidance goals of either trigger-focused or ideal-focused *Personal Systems*, or some combination of the two, could prove valuable to consumers and manufacturers alike. This app would scan the barcodes of pre-packaged food products and, based on the personalized food-related concerns of the consumer, contrast these personalized preferences with a database that catalogued all the ingredients contained within that product. Users could simply select any ingredient or types of ingredient that they wanted to avoid, and the app could quickly process a scanned product to see if it contained any of these flagged ingredients. Users could prioritize their food-related concerns based on their personal preferences, and any number of preferences could be programmed. The app could also allow the user, if no negatives are flagged, to explore the nature of contained ingredients that they were unsure about by providing the essential information about each ingredient, like what it is derived from, why it is used, if there are any known health risks, etc. Another feature that could be incorporated to help trigger-focused consumers could be some method of self-reporting instances of cross-contamination; products that received a certain number of reports of a particular kind of contaminant might also be flagged for those consumers concerned with that trigger. There is an app in existence that could be used to accomplish some of these trigger-focused and ideal-focused objectives called Fooducate ("About Fooducate, n.d.). During the completion of this thesis, Fooducate was available in Canada on iPhone, but did not appear to be available on Android devices. Also, this app is heavily marketed toward weight loss, which could discourage consumers from using it.

Food manufacturers could benefit from this type of app. Collecting data related to the ingredients that consumers prefer and avoid could be very valuable for contriving new products or for modifying existing products. Manufacturers that are confident in the contents of the products that they produce would benefit from informed consumers, as the results of this thesis suggest that consumers may make assumptions about the nature of ingredients when making food choices. Logically, the manufacturer should prefer to minimize the likelihood of their products' dismissal by consumers due to wrongful assumptions about the negativity of unknown, chemical-sounding, or difficult-to-pronounce ingredients. Further, increasing the consumer's ability to quickly obtain trusted

information about ingredients could assuage concerns about low-risk preservatives and additives that may be assumed by consumers to be overly negative. If the app encouraged more people to be concerned about the content of their food by quickly informing them about the nature of ingredients, more manufacturers may be motivated to appease the health-related concerns of consumers.

An app of this nature may require Internet connectivity. A consumer in possession of a smartphone cannot necessarily afford data; if the consumer can afford data, it could be considered a finite resource that is rationed and not used to satisfy nutrition information needs. This could be a barrier to consumers who possessed this type of app, as well as to those who might otherwise engage in supplementary nutrition information seeking via smartphone Internet browser if they had access to the Internet while shopping in the supermarket. To ensure that any consumer could engage in these nutrition information-seeking behaviours, supermarkets could provide free Wi-Fi to customers. If an app like this were to become popular, or if it were determined that supplementary nutrition information seeking via smartphone was similarly commonplace in the general population, a strong case for the provision of Wi-Fi in the supermarket could be made.

Finally, the findings of this thesis have suggested that the information provided in the list of ingredients may not be ideal for consumers. Governments could also consider the findings of this study when developing food-labelling regulations. As participants appeared to conceive ingredients in terms of *types*, consumers might prefer some format in which preservatives and additives are highlighted so as to limit or control assumptions about the negativity of unknown ingredients. As the proliferation of smartphone technology is not likely to cease, perhaps the government should consider sponsoring the development of an app that could be free to all Canadian consumers. Just as food labels are a population-level approach to influence consumers' food choices (Cowburn & Stockley, 2005), a free and authoritative government-sponsored app could effectively replace the food label – especially if it were interactive and could be customized to address the nutrition-related interests of the consumer. Such an app has the potential to increase the average consumers' capacity to make better food choices by providing quick access to accurate and authoritative information at the point of purchase.

8.3. LIMITATIONS

The complexities of the Dalhousie Student population must be acknowledged. Participants ranged from 18 years old to an undisclosed maximum age greater than 30 years old, though only 6.5% of the sample indicated being over 30 years old. This sample was therefore largely or entirely consistent of consumers of the Millennial Generation, comprised of those born between 1982 and 2003 (Winograd & Hais, 2011). As such, the findings of this study may not have implications for the nutrition-related information behaviours of older generations or the next generation of consumers. Further, this student population is presumably more educated than the average consumer, and may be more likely to come from a higher income household than the average consumer. Therefore, these findings should not be considered representative of any larger population beyond this university student population. Future research may confirm that these findings are consistent in other populations of consumers.

As this thesis relied on a convenience sampling method to recruit Phase 1 participants, the sample was likely affected by some degree of self-selection bias (Cooke & Papadaki, 2014). Given the focus of this thesis—which was advertised to prospective participants as "…an attempt to better understand consumers' use of nutrition information during food shopping purchase decisions" (see Appendices D, E, & F)—it would be reasonable to assume that there may have been a tendency to draw participants who were more interested than disinterested in food and nutrition (Cooke & Papadaki, 2014). In order to conceptualize this phenomenon of self-selection, the reader would benefit from considering Visschers et al.'s (2013) effort at segmentation, through which four 'types' of food label user were identified (see Section 3.1.2). Self-selection bias posits that those who would fall into Visschers et al.'s (2013) *Official Information Users* segment, the most health conscious and interested in nutrition information, who report the most use of nutrition information and the healthiest eating behaviours, may have been more likely to complete Phase 1 of the study than the other three types of consumer. This could be attributable to several factors, such as the desire of these *Official Information Users* to discuss their positive nutrition behaviours, or simply an increased interest in nutrition.

Alternatively, Visschers et al.'s (2013) *Uninterested* segment may be least likely to participate in this study, as this segment consisted of consumers who were least health conscious and interested in nutrition information, and demonstrate the least healthy eating behaviours (Visschers et al., 2013). Those within the Dalhousie student population who were not very interested in nutrition or who considered their own nutrition information use to be low may have been less likely to complete the NIU Survey – regardless of an Incentive Prize Draw. Therefore, it is important to acknowledge is that this thesis has focused on the behaviours of health conscious consumers that use food label information, and not those who do not use food labels.

While this does not necessarily decrease the validity of the study, given that the primary goal was always to explore how consumers use ingredient information, there may have been some degree of under-representation from Visschers et al.'s (2013) *Uninterested* segment, which comprised approximately 28% of their sample. This under-representation is arguably apparent in the results of many NIU Survey questions discussed in Chapter 5 (see Sections 5.2 & 5.3), as there were no instances in which 28% of the sample reported behaviours consistent with Visschers et al.'s (2013) *Uninterested* segment. Those who participated in this study demonstrated at least some interest in nutrition-related topics, and therefore likely came from the other three segments – unless of course this self-reported food label use was over-reported due to social desirability bias (Cooke & Papadaki, 2014). The three other segments of food label information users identified by Visschers et al. (2013) were the Official Information Users, the Internet Users, and the Moderate Users. The most interesting segment to consider—the Internet Users—is very relevant to consider in relation to the results of this study, as this segment is characterized by the heavy use of Internet sources for nutrition information, and was the segment with the youngest average age and the highest average education level, according to Visschers et al. (2013).

Having focused the study on a relatively young population of university student, this study may have also disproportionally drawn participants from this Internet Users segment. This could account for the relatively high self-reporting of in-store supplementary information seeking via smartphone Internet browser in response to NIU Survey Questions 28 and 29, as 44-54% of participants indicated that they had engaged in this behaviour in

the past upon encountering an unknown ingredient on the food label, as well as the 40% of participants who indicated having looked up an unknown ingredient using the Internet at home after purchasing the product.

Described earlier in Section 4.1, the results of this study—as with many studies focused on consumers' use of the food label (Grunert, Wills, & Fernández-Celemín, 2010)—may have been affected by social desirability bias – a tendency to over-estimate favourable behaviours when retrospectively self-reporting past behaviours (Higginson et al., 2002). This phenomenon can be mediated through more objective methodologies (Grunert, Wills, & Fernández-Celemín, 2010), such as the simulated shopping task, as participants may be less likely to misrepresent themselves if they have to demonstrate these behaviours. Delivering the NIU Survey via the Internet may also reduce the impact of social desirability bias on self-reported behaviours, as participants may feel less pressure to be presented favourably when it was possible to complete the survey anonymously (Goodman et al., 2011). Nonetheless, social desirability bias was expected to affect the results of this study to some degree, leading to some degree of over-reported behaviours related to food label information use.

Also mentioned earlier in Section 4.1, it may be the nature of the questions used to measure food label use that has led to this suspicion of over-reported food label use. A good example of how this could lead to over-reporting was noted in this thesis. NIU Survey Questions 28 and 29 asked about the use of smartphone technology to search for supplementary nutrition information in reaction to unknown ingredients encountered while shopping in the supermarket. Based on the results of these questions, one might assume that searching for supplementary nutrition information related to unknown ingredients was common behaviour, but the qualitative data revealed that this behaviour might only occur under very specific circumstances, depending on the context of the individual consumer.

The nature of the simulated shopping task—having been conducted in a lab environment—may have affected participants' behaviour to some degree. Any circumstance in which a participant is removed from the natural setting in which a behaviour would usually occur inevitably affects the measured behaviour to some degree

(Wahlich et al., 2013). Phase 2 participants, aware that they were participating in a study related to food label use, may have used the food label to a greater extend than they would naturally. However, the funneling strategy that was incorporated into the Phase 2 protocol was intended to mediate this affect. Participants were not aware of the focus on the list of ingredients and most participants appeared to use the list of ingredients naturally while completing Phase 2.

Another limitation to consider is the discrepancy between the results from NIU Survey Questions 28 and 29. Both questions inquired about the same behaviour; while the first asked about several possible reactions to an unknown ingredient encountered while shopping in the supermarket, with one multiple-choice response describing the supplementary seeking of information via smartphone in-store (see Question 28, Appendix A), the second asked directly about this behaviour (see Question 29, Appendix A). The discrepancy could be attributable to many factors, such as social desirability bias, and is an area that should be improved upon in future research.

One final limitation to consider is the impact of the sample size on the ingredient information use examined during Phase 2. There were several types of consumers who were not selected by the Screening Tool to participate in Phase 2, such as vegan consumers or consumers with a range of allergies. Of the 3 participants who were categorized as trigger-focused consumers, 2 were diagnosed with Celiac Disease and 1 was allergic to wheat. A range of allergies and intolerances were not represented. Future research might focus on the considering the ingredient information use of these other types of trigger-focused consumers.

8.4. CONCLUSION

This novel mixed-methods approach proved to be an effective way to examine how consumers use the list of ingredients and could be used to focus on how other aspects of food label are used in the future. This sample of Dalhousie University students reported using the list of ingredients in a variety of manners, including looking for both the presence and absence of ingredients, the order of ingredients, and appeared to be

generally interested in understanding the content of foods, with many relying on Internet-based sources of nutrition information when this understanding is insufficient. Moreover, a surprisingly large percentage of participants indicated using their smartphone to access the Internet while shopping for food in the supermarket, though more research is warranted to better understand the frequency and nature of this phenomenon.

The qualitative data revealed a variety of manners that ingredient information can be used. Furst et al. (1996) was instrumental in the thematic analysis of this data, providing a conceptual framework that was used to identify the various ways that participants used ingredient information. While two general types of user emerged, one might suspect from the modest sample size that there could be more types of ingredient information user. The two types of *Personal Systems* reliant on ingredient information were identified: 1) trigger-focused and 2) ideal-focused. Both types of *Personal Systems* focused on food-related attributes that the individual consumer perceived to be negative, using a combination of *Value Negotiations* and *Strategies* that are informed by the various contextual factors that motivate the application of the *Personal System*.

The nature of these *Personal Systems* appears to be heavily dependent on the contextual factors motivating their application; future research might focus more on the variable levels of intensity with which these *Personal Systems* are employed. It is speculated that either type of *Personal System* can range in intensity; for example, any consumer with a life-threatening food allergy, severe food intolerance, or a devoted ethical stance may utilize a given *Personal System* during every single food choice – or at least the aspect(s) of the *Personal System* deemed most critical. Other, less invested consumers may utilize their *Personal Systems* most of the time, or some of the time, depending on these contextual factors, but they may also make exceptions to their *Personal Systems* whenever the benefits of the exception are perceived to outweigh its consequences. For some, these exceptions may occur frequently, while for others, they may never occur.

8.5. FUTURE RESEARCH

Given the modest size of the Phase 2 sample, the qualitative data collected in this thesis may have only scratched the idiomatic surface of ingredient information use, as there are many possible contextual factors that could affect the nature of this behaviour that were not adequately represented in Phase 2 participants. Future research should both confirm and expand on these findings using a larger and more diverse sample. Further, it may be beneficial to qualitatively explore the behaviours of those who do not use and those who occasionally use ingredient information with those who are heavy users of ingredient information. While this study attempted to explore the behaviours of those who were heavy users of ingredient information, it became apparent that the Phase 2 sample ranged from moderate to heavy use of the list of ingredients. An effort at segmentation similar to Visschers et al. (2013) focusing on the use of ingredient information could be beneficial, and may provide a better understanding of the proportion of consumers that use ingredient information to varying degrees. Future research should also consider the various barriers faced by those who do not use ingredient information when making food choices.

This thesis has also confirmed that some consumers do engage in supplementary information seeking in reaction to unknown ingredients listed on food labels. This is an aspect of food label information use that had not yet been explored prior to this thesis project, and definitely warrants future research given the prevalence of smartphone technology and the average consumers' capacity to satisfy nutrition information needs as they arise while shopping for foods in the supermarket. The theoretical implications of this thesis (see Section 7.4) suggest that searching the Internet via smartphone may be the most accessible and available way for consumers to obtain nutrition information (Lioutas, 2014), providing quick access information sources that are trusted by Canadian consumers (Canadian Council of Food and Nutrition, 2008). This may have great implications on how nutrition information is acquired currently and in the future, making it an important phenomenon to consider in future research.

Future research might also consider utilizing a similar protocol to focus on other aspects of food label information use. As the current understanding of how consumers use

food label information is arguably under-developed, future research employing a mixed-method approach—and specifically a qualitative simulated shopping task, or similar methodology that incorporates both decision-making and conversation—could be directed toward other aspects of food label information use. Also, Furst et al.'s (1996) model proved to be an effective conceptual tool to frame the thematic coding of the qualitative data collected during the simulated shopping task, a process that could be replicated in future studies. Furthermore, future research might also consider the proposed modifications to the food choice model, specifically the phenomena of exceptions to *Personal Systems*. Directed research on trigger-focused *Personal Systems* may also be interesting, which could further consider the extent that trigger-focused consumers can make exceptions to their *Personal Systems*.

REFERENCES

About Dal's communities. (n.d.). Retrieved on January 10, 2015, from http://www.dal.ca/about-dal/dal-and-the-community/about-dal-communities.html

About Fooducate. (n.d.). Retrieved on June 20, 2015, from http://www.fooducate.com/about

Balasubramanian, S. K., & Cole, C. (2002). Consumers' search and use of nutrition information: The challenge and promise of the Nutrition Labeling and Education Act. *Journal of Marketing, 66*(3), 112. Retrieved from http://www.jstor.org/stable/3203458

Barnett, J., Leftwich, J., Muncer, K., Grimshaw, K., Shepherd, R., Raats, M. M., ... Lucas, J. S. (2011a). How do peanut and nut-allergic consumers use information on the packaging to avoid allergens? *Allergy, 66*(7), 969–978. doi: 10.1111/j.1398-9995.2011.02563.x

Barnett, J., Muncer, K., Leftwich, J., Shepherd, R., Raats M. M., Gowland, H. M.,. . . Lucas, J. S. (2011b). Using 'may contain' labelling to inform food choice: A qualitative study of nut allergic consumers. *BMC Public Health, 11*(1), 734. doi:10.1186/1471-2458-11-734

Barnett, J., Vasileiou, K., Gowland, M. H., Raats, M. M., & Lucas, J. S. (2013). Beyond labelling: What strategies do nut allergic individuals employ to make food choices? A qualitative study. *PLoS One, 8*(1), 1-7. doi:10.1371/journal.pone.0055293

Bates, M. J. (1989). The design of browsing and berrypicking techniques for the online search interface. *Online Information Review 13*(5), 407-424.

Bates, M. J. (2002). Toward an integrated model of information seeking and searching. *The New Review of Information Behaviour Research, 3*, 1–15. Retrieved from http://pages.gseis.ucla.edu/faculty/bates/articles/info_SeekSearch-i-030329.html

Bearth, A., Cousin, M.-E., & Siegrist, M. (2014). The consumer's perception of artificial food additives: Influences on acceptance, risk and benefit perceptions. *Food Quality and Preference, 38*, 14-23. doi:10.1016/j.foodqual.2014.05.008

Blaylock, J., Smallwood, D., Kassel, K., & Variyam, J. (1999). Economics, food choices, and nutrition. *Food Policy, 24*(2-3)*,* 269-286.

Bornkessel, S., Bröring, S., Omta, S. W. F., & van Trijp, H. (2013). What determines ingredient awareness of consumers? A study on ten functional food ingredients. *Food Quality and Preference, 32*(Part C), 330-339. doi:10.1016/j.foodqual.2013.09.007

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. doi:10.1191/1478088706qp063oa

Breikss, C. (2012, November 21). Infographic: Canadian Internet usage statistics on mobile, search and social [Web log comment]. Retrieved from http://www.6smarketing.com/blog/infographic-canadian-internet-usage-statistics/

Buchler, S., Smith, K., & Lawrence, G. (2010). Food risks, old and new: Demographic characteristics and perceptions of food additives, regulation and contamination in Australia. *Journal of Sociology, 46*(4), 353-374. doi:10.1177/1440783310384449

Burton, S., & Andrews, J. C. (1996). Age, product nutrition, and label format effects on consumer perceptions and product evaluations. *The Journal of Consumer Affairs*, 30(1), 68-89. Doi: 10.1111/j.1745-6606.1996.tb00726.x

Burton, S., Garretson, J., & Velliquette, A. (1999). Implications of accurate usage of nutrition facts panel information for food product evaluations and purchase intentions. *Journal of the Academy of Marketing Science, 27*(4), 470-480. doi:10.1177/0092070399274006

Campos, S., Doxey, J., & Hammond, D. (2011). Nutrition labels on pre-packaged foods: a systematic review. *Public Health Nutrition, 14*(8), 1496-1506. doi:10.1017/S1368980010003290

Canadian Cancer Society. (n.d.). *Diet*. Retrieved December 9, 2014, from http://www.cancer.ca/en/cancer-information/cancer-101/what-is-a-risk-factor/diet/?region=ns

Canadian Council of Food and Nutrition. (2008). *Tracking Nutrition Trends VII*. Mississauga, ON. Retrieved from https://www.cfdr.ca/Downloads/CCFN-docs/C1180---TNT-VII-FINAL-REPORT---full-report--Sept-1.aspx

Canadian Council of Food and Nutrition. (2009). *Tracking Nutrition Trends: A twenty year history*. Mississauga, ON: Canadian Council of Food and Nutrition. Retrieved from https://www.cfdr.ca/Downloads/CCFN-docs/20-Years-of-TNT-%28Sep12%29---Final.aspx

Canadian Food Inspection Agency. (2014, June 10). Interactive tool – Understanding a food label. Retrieved on March 29, 2015, from http://www.inspection.gc.ca/food/labelling/food-labelling-for-consumers/understanding-a-food-label/eng/1400530265966/1400530332584

Canadian Foundation for Dietetic Research. (2013). *CFDR presents tracking nutrition trends 2013.* Toronto, ON. Retrieved from https://www.cfdr.ca/Downloads/CCFN-docs/TNT-2013-Summary-Report.aspx

Case, D. O. (2007). *Looking for information: A survey of research on information seeking, needs, and behaviour (2nd ed.).* Bradford; Bingley, WA: JAI Press.

CCFL. (2010). *General standard for the labelling of prepackaged foods, (CODEX STAN 1–1985).* Rome, Amended 1991, 1999, 2001, 2003, 2005, 2008 and 2010.

Cohen, D., & Babey, S. (2012). Contextual influences on eating behaviours: Heuristic processing and dietary choices. *Obesity Reviews, 13*(9), 766-779. doi: 10.1111/j.1467-789X.2012.01001.x

Cooke, R., & Papadaki, A. (2014). Nutrition label use mediates the positive relationship between nutrition knowledge and attitudes towards healthy eating with dietary quality among university students in the UK. *Appetite, 83*, 297-303. http://dx.doi.org/10.1016/j.appet.2014.08.039

Courtright, C. (2007). Context in information behavior research. *Annual Review of Information Science and Technology, 41*(1), 273-306. doi:10.1002/aris.2007.1440410113

Cowburn, G., & Stockley, L. (2005). Consumer understanding and use of nutrition labelling: a systematic review. *Public Health Nutrition, 8*(1), 21-28. doi:10.1079/PHN2004666

Creswell, J. W. (2007). *Qualitative Inquiry & Research Design: Choosing Among Five Approaches, 2nd edition.* Thousand Oaks, CA: Sage Publications.

Cummings, A. J., Knibb, R. C., King, R. M., & Lucas, J. S. (2010). The psychosocial impact of food allergy and food hypersensitivity in children, adolescents and their families: A review. *Allergy, 65*(8), 933-945. doi:10.1111/j.1398-9995.2010.02342.x

Dal at a glance. (n.d.). Retrieved on January 10, 2015, from http://www.dal.ca/about-dal/dal-at-a-glance.html

Davy, S. R., Benes, Beverly A., & Driskell, J. A. (2006). Sex differences in dieting trends, eating habits, and nutrition beliefs of a group of Midwestern college students. *Journal of the American Dietetic Association, 106*(10), 1673-1677. doi:10.1016/j.jada.2006.07.017

Dervin, B. (2003). Given a context by any other name: Methodological tools for taming the unruly beast. In B. Dervin & L. Foreman-Wernet, & E. Lauterbach (Eds.). *Sense-Making Methodology reader: Selected writings of Brenda Dervin* (pp. 111-132). Cresskill, NJ: Hampton Press.

Devcich, D. A., Pedersen, I. K., & Petrie, K. J. (2007). You eat what you are: Modern health worries and the acceptance of natural and synthetic additives in functional foods. *Appetite, 48*(3), 333-337. doi:10.1016/j.appet.2006.09.014

Dickson-Spillmann, M., Siegrist, M., & Keller, C. (2011). Attitudes toward chemicals are associated with preference for natural food. *Food Quality and Preference, 22*(1), 149-156. doi:10.1016/j.foodqual.2010.09.001

Dixon, J. (2007). Supermarkets as new food authorities. In D. Burch & G. Lawrence (Eds.). *Supermarkets and Agri-food Supply Chains: Transformations in the Production and Consumption of Foods*. Cheltenham: Edward Elgar.

Drichoutis, A. C., Lazaridis, P., & Nayga, R. M. (2005). Nutrition knowledge and consumer use of nutritional food labels. *European Review of Agricultural Economics, 32*(1), 93-118. doi:10.1093/erae/jbi003

Drichoutis, A. C., Lazaridis, P., & Nayga, R. M. (2006). Consumers' use of nutrition labels: A review of research studies and issues. *Academy of Marketing Science Review, 9*, 1-22. Retrieved from http://www.amsreview.org/articles/drichoutis09-2006.pdf

Drichoutis, A. C., Lazaridis, P., Nayga, R. M., Kapsokefalou, M., & Chryssochoidis, G. (2008). A theoretical and empirical investigation of nutritional label use. *The European Journal of Health Economics, 9*(3), 293-304. doi:10.1007/s10198-007-0077-y

Driskell, J. A., Schake, M. C., & Detter, H. A. (2008). Using nutrition labeling as a potential tool for changing eating habits of university dining hall patrons. *Journal of the American Dietetic Association, 108*(12), 2071-2076.

Erdelez, S. (1999). Information encountering: It's more than just bumping into information. *Bulletin of the American Society of Information Science, 25*(3). Retrieved from http://www.asis.org/Bulletin/Feb-99/erdelez.html

Ericsson, K. A., & Simon, H. A. (1980). Verbal reports as data. *Psychological Review, 87*(3), 215-251. http://dx.doi.org.ezproxy.library.dal.ca/10.1037/0033-295X.87.3.215

Evans, G., de Challemaison, B., & Cox, D. N. (2010). Consumers' ratings of the natural and unnatural qualities of foods. *Appetite, 54*(3), 557–563. doi:10.1016/j.appet.2010.02.014

Fernqvist, F., & Ekelund, E. (2014). Credence and the effect on consumer liking of food – A review. *Food Quality and Preference 32*, 340-353. http://dx.doi.org/10.1016/j.foodqual.2013.10.005

Food and Drugs Act: Regulations amending the Food and Drug regulations (nutrition labelling, nutrient content claims and health claims). (2003). *Canadian Gazette Part II*, 137(1). Retrieved from http://publications.gc.ca/gazette/archives/p2/2003/2003-01-01/pdf/g2-13701.pdf

Furst, T., Connors, M., Bisogni, C. A., Sobal, J., & Falk, L. W. (1996). Food choice: A conceptual model of the process. *Appetite, 26*(3), 247-266. doi:10.1006/appe.1996.0019

Garretson, J., & Burton, S. (2000). Effects of nutrition facts panel values, nutrition claims, and health claims on consumer attitudes, perceptions of disease-related risks, and trust. *Journal of Public Policy & Marketing, 19*(2), 213-227. Retrieved from http://www.jstor.org/stable/30000628

Goodman, S., Hammond, D., Pillo-Blocka, F., Glanville, T., & Jenkins, R. (2011). Use of nutritional information in Canada: National trends between 2004 and 2008. *Journal of Nutrition Education and Behavior, 43*(5), 356-365. doi:10.1016/j.jneb.2011.02.008

Gorton, D., Ni Mhurchu, C., Chen, M., & Dixon, R. (2009). Nutrition labels: A survey of use, understanding and preferences among ethnically diverse shoppers in New Zealand. Public Health Nutrition, 12(9), 1359-1365. doi:10.1017/S1368980008004059

Government of Canada. (2014). Consulting Canadians to modernize and improve food labels. Retrieved from the Health Canada website: http://www.hc-sc.gc.ca/fn-an/alt_formats/pdf/label-etiquet/modernize-report-moderniser-rapport-eng.pdf

Graham, D. J., & Jeffery, R. W. (2011). Location, location, location: Eye-tracking evidence that consumers preferentially view prominently positioned nutrition information. *Journal of the American Dietetic Association, 111*(11), 1704-1711. doi:10.1016/j.jada.2011.08.005

Graham, D. J., & Jeffery, R. W. (2012). Predictors of nutrition label viewing during food purchase decision making: an eye tracking investigation. *Public Health Nutrition, 15*(2), 189-97. doi:10.1017/S1368980011001303

Graham, D. J., & Laska, N. M. (2012). Nutrition label use partially mediates the relationship between attitude toward healthy eating and overall dietary quality among college students. *Journal of the Academy of Nutrition and Dietetics, 112*(3), 414-418. doi:10.1016/j.jada.2011.08.047

Graham, D. J., Orquin, J. L., & Visschers, V. H. M. (2012). Eye tracking and nutrition label use: A review of the literature and recommendations for label enhancement. *Food Policy, 37*(4), 378-382. doi:10.1016/j.foodpol.2012.03.004

Grunert, K. G. (2005). Food quality and safety: Consumer perception and demand. *European Review of Agricultural Economics, 32*(3), 369-391. doi:10.1093/eurrag/jbi011

Grunert, K. G. (2006). Marketing parameters and their influence on consumer food choice. In R. Shepherd & M. Raats (Eds.), T*he psychology of food choice* (pp. 161-177). Oxfordshire, UK: CABI Publishing.

Grunert, K. G., Fernández-Celemín, L., Wills, J. M., Storcksdieck genannt Bonsmann, S., & Nureeva, L. (2010). Use and understanding of nutrition information on food labels in six European countries. *Journal of Public Health, 18*(3), 261-277. doi:10.1007/s10389-009-0307-0

Grunert, K. G., Scholderer, J., & Rogeaux, M. (2011). Determinants of consumer understanding of health claims. *Appetite, 56*(2), 269-277. DOI: 10.1016/j.appet.2011.01.009

Grunert, K., & Wills, J. (2007). A review of European research on consumer response to nutrition information on food labels. *Journal of Public Health, 15*(5), 385-399. doi:10.1007/s10389-007-0101-9

Grunert, K. G., Wills, J. M., & Fernandez-Celemín, L. (2010). Nutrition knowledge, and use and understanding of nutrition information on food labels among consumers in the UK. *Appetite, 55*(2), 177-189.

Guthrie, J.F., Fox, J.J., Cleveland, L.E., & Welsh, S. (1995). Who uses nutritional labeling, and what effects does label use have on diet quality? *Journal of Nutrition Education, 27*(4), 163–172. doi:10.1016/S0022-3182(12)80422-5

Hauser, M., Jonas, K., & Riemann, R. (2011). Measuring salient food attitudes and food-related values. An elaborated, conflicting and interdependent system. *Appetite, 57*(2), 329-338. doi:10.1016/j.appet.2011.05.322

Health Canada. (2008). The nutrition facts table: What is the nutrition facts table? Retrieved on September 10, 2014, from http://www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/cons/index-eng.php

Health Canada. (2013, November 8). Nutrition labelling: Regulations and compliance. Health Canada. Retrieved on September 10, 2014, from http://www.hc-sc.gc.ca/fn-an/label-etiquet/nutrition/reg/index-eng.php

Health Canada. (2014, July 14). *Health Canada's proposed changes to the format requirements for the display of nutrition and other information on food labels*. Ottawa, ON: Bureau of Nutritional Sciences, Food Directorate, Health Products and Food Services. Retrieved from http://www.hc-sc.gc.ca/fn-an/alt_formats/pdf/consult/2014-format-requirements-exigences-presentation/document-consultation-eng.pdf

Herath, D., Cranfield, J., & Henson, S. (2008). Who consumes functional foods and nutraceuticals in Canada? Results of cluster analysis of the 2006 survey of Canadians' demand for food products supporting health and wellness. *Appetite, 51*(2), 256-265.

Hess, R., Visschers, V. H. M., & Siegrist, M. (2011). The role of health-related, motivational and sociodemographic aspects in predicting food label use: a comprehensive study. *Public Health Nutrition, 15*(3), 407-414. doi:10.1017/S136898001100156X

Hieke, S., & Taylor, C. (2012). A critical review of the literature on nutritional labeling. *Journal of Consumer Affairs, 46*(1), 120-156. doi:10.1111/j.1745-6606.2011.01219.x

Higginson, C. S., Rayner, M. J., Draper, S., & Kirk, T. R. (2002). The nutrition label--which information is looked at? *Nutrition and Food Science, 32*(2/3), 92-99. doi:10.1108/00346650210423392

Hollywood, L. E., Armstrong, G. A., & Durkin, M. G. (2007). Using behavioural and motivational thinking in food segmentation. *International Journal of Retail & Distribution Management, 35*(9), 691-702. doi:10.1108/09590550710773246

J. D. Power & Associates. (2014, May 8). *Canadian wireless total ownership experience study*. Retrieved on November 12, 2014, from http://www.jdpower.com/press-releases/2014-canadian-wireless-total-ownership-experience-study

Johnson, M. (1990). Age differences in decision making: A process methodology for examining strategic information processing. *Journal of Gerontology, 45*(2), P75-P78. doi:10.1093/geronj/45.2.P75

Leathwood, P. D., Richardson, D. P., Sträter, P., Todd, P. M. & van Trijp, H. C. M. (2007). Consumer understanding of nutrition and health claims: sources of evidence. *British Journal of Nutrition, 98*(3), 474-484.

Leedy, P., & Ormrod, Jeanne Ellis. (2013). *Practical research : Planning and design* (10th ed.). Boston: Pearson.

Levy, A. S., & Fein, S. B. (1998). Consumers' ability to perform tasks using nutrition labels. *Journal of Nutrition Education, 30*(4), 210-217. doi:10.1016/S0022-3182(98)70321-8

Lind, R., Arslan, G., Eriksen, H., Kahrs, R., Haug, G., Florvaag, T., & Berstad, T. (2005). Subjective health complaints and modern health worries in patients with subjective food hypersensitivity. *Digestive Diseases and Sciences, 50*(7), 1245-1251. doi:10.1007/s10620-005-2767-6

Lioutas, E. D. (2014). Food consumer information behavior: Need arousal, seeking behavior, and information use. *Journal of Agricultural & Food Information*, *15*(2), 81-108. doi:10.1080/10496505.2014.880655

Mackey, M., & Metz, M. (2009). Ease of reading of mandatory information on Canadian food product labels. *International Journal of Consumer Studies, 33*(4), 369-381. doi:10.1111/j.1470-6431.2009.00787.x

Mai, R., & Hoffmann, S. (2012). Taste lovers versus nutrition fact seekers: How health consciousness and self‐efficacy determine the way consumers choose food products. *Journal of Consumer Behaviour, 11*(4), 316-328. doi:10.1002/cb.1390

Millen, B., & Vernarelli, J. (2008). Survey research planning and questionnaire design. In E. R. Monsen & L. Van Horn (Eds.), *Research: Successful Approaches* (3rd ed.) (pp. 167-186). Chicago, IL: American Dietetic Association.

Miller, L. M. S., & Cassady, D. L. (2012). Making healthy food choices using nutrition facts panels. The roles of knowledge, motivation, dietary modifications goals, and age. *Appetite, 59*(1), 129-139. doi:10.1016/j.appet.2012.04.009

Misra, R. (2007). Knowledge, attitudes, and label use among college students. *Journal of the American Dietetic Association, 107*(12), 2130-2134. doi:10.1016/j.jada.2007.09.001

Mohr, G. S., Lichtenstein, D. R., & Janiszewski, C. (2012). The effect of marketer-suggested serving size on consumer responses: The unintended consequences of consumer attention to calorie information. *Journal of Marketing, 76*(1), 59-75. http://dx.doi.org/10.1509/jm.10.0073

Moorman, C. (1990). The effects of stimulus and consumer characteristics on the utilization of nutrition information. *Journal of Consumer Research*, *17*(3), 362-374. Retrieved from http://www.jstor.org/stable/2626801

Nayga, R. M. (2000). Nutrition knowledge, gender, and food label use. *Journal of Consumer Affairs, 34*(1), 97-112. doi:10.1111/j.1745-6606.2000.tb00086.x

Nayga, R. M., Lipinski, D., & Savur, N. (1998). Consumers' Use of Nutritional Labels While Food Shopping and At Home. *Journal of Consumer Affairs, 32*(1), 106-120. doi:10.1111/j.1745-6606.1998.tb00402.x

Ollberding, N. J., Wolf, R. L., & Contento, I. (2011). Food label use and its relation to dietary intake among US adults. *Journal of the American Dietetic Association, 111*(5), S47-S51. doi:10.1016/j.jada.2011.03.009

Ostry, A., Young, M. L., & Hughes, M. (2008). The quality of nutritional information available on popular websites: a content analysis. *Health Education Research, 23*(4), 648-55. doi:10.1093/her/cym050

Parmenter, K., Waller, J., & Wardle, J. (2000). Demographic variation in nutrition knowledge in England. *Health Education Research, 15*(2), 163-74. doi:10.1093/her/15.2.163

Pohlmeier, A., Reed, D. B., Boylan, M., & Harp, S. (2012). Using Focus Groups to Develop a Nutrition Labeling Program within University Food Service. *Family and Consumer Sciences Research Journal, 40*(4), 431-443. doi:10.1111/j.1552-3934.2012.02121.x

Pope, C., & Mays, N. (1995). Reaching the parts other methods cannot reach: An introduction to qualitative methods in health and health services research. *British Medical Journal, 311*(6996), 42–45. Retrieved from http://www.jstor.org/stable/29727970

Public Health Agency of Canada and Canadian Institute for Health Information. (2011). *Obesity in Canada: A Joint Report from the Public Health Agency of Canada and the Canadian Institute for Health Information*. Report No.: HP5–107. Retrieved from https://secure.cihi.ca/free_products/Obesity_in_canada_2011_en.pdf

Rasberry, C. N., Chaney, B. H., Housman, J. M., Misra, R., & Miller, P. J. (2007). Determinants of nutrition label use among college students. *American Journal of Health Education, 38*(2), 76-82. doi:10.1080/19325037.2007.10598947

Rayner, M., Boaz, A., & Higginson, C. (2001). Consumer use of health-related endorsements on food labels in the United Kingdom and Australia. *Journal of Nutrition Education, 33*(1), 24-30. doi:10.1016/S1499-4046(06)60006-7

Rayner, M., Wood, A., Lawrence, M., Mhurchu, C. N., Albert, J., Barquera, S... Walker. C. (2013). Monitoring the health‐related labelling of foods and non‐alcoholic beverages in retail settings. *Obesity Reviews, 14*, 70-81. doi:10.1111/obr.12077

Roininen, K., Lähteenmäki, L., & Tuorila, H. (1999). Quantification of consumer attitudes to health and hedonic characteristics of foods. *Appetite, 33*(1), 71-88. doi:10.1006/appe.1999.0232

Rothman, Russell L., Housam, Ryan, Weiss, Hilary, Davis, Dianne, Gregory, Rebecca, Gebretsadik, Tebeb, . . . Elasy, Tom A. (2006). Patient understanding of food labels: The role of literacy and numeracy. *American Journal of Preventive Medicine, 31*(5), 391-398. doi:10.1016/j.amepre.2006.07.025

Sacco, J. E., Sumanac, D., & Tarasuk, V. (2013). Front-of-package references to fiber on foods in Canadian supermarkets highlight the need for increased nutrition knowledge among consumers. *Journal of Nutrition Education and Behavior, 45*(6), 518-524. doi:10.1016/j.jneb.2013.02.003

Savolainen, R. (1995). Everyday life information seeking: Approaching information seeking in the "way of life." *Library and Information Science Research, 17*(3), 259-294. doi:10.1016/0740-8188(95)90048-9

Savolainen, R. (2008). Source preferences in the context of seeking problem-specific information. *Information Processing and Management, 44*(1), 274-293. doi:10.1016/j.ipm.2007.02.008

Savolainen, R. (2009). Small world and information grounds as contexts of information seeking and sharing. *Library & Information Science Research*, *31*(1), 38–45. doi:10.1016/j.lisr.2008.10.007

Savolainen, R., & Kari, J. (2004). Placing the Internet in information source horizons. A study of information seeking by Internet users in the context of self-development. *Library and Information Science Research, 26*(4), 415-433. doi:10.1016/j.lisr.2004.04.004

Scheibehenne, B., Miesler, L., & Todd, P. M. (2007). Fast and frugal food choices: Uncovering individual decision heuristics. *Appetite, 49*(3), 578-589. doi:10.1016/j.appet.2007.03.224

Schermel, A., Emrich, T. E., Arcand, J. A., Wong, C. L., & L'Abbé, M. (2013). Nutrition marketing on processed food packages in Canada: 2010 Food Label Information Program. *Applied Physiology, Nutrition and Metabolism, 38*(6), 666-672. dx.doi.org/10.1139/apnm-2012-0386

Schermel, A., Mendoza, J., Henson, S., Dukeshire, S., Pasut, L., Emrich, T., . . . L'Abbé, M. (2014). Canadians' perceptions of food, diet, and health--a national survey. *PloS One, 9*(1), E86000. doi:10.1371/journal.pone.0086000

Sharf, M., Sela, R., Zentner, G., Shoob, H., Shai, I., & Stein-Zamir, C. (2012). Figuring out food labels. Young adults' understanding of nutritional information presented on food labels is inadequate. *Appetite, 58*(2), 531-534. doi:10.1016/j.appet.2011.12.010

Sheth, S. S., Waserman, S., Kagan, R., Alizadehfar, R., Primeau, M.-N., Elliot, S., . . . Clarke, A. E. (2010). Role of food labels in accidental exposures in food-allergic individuals in Canada. *Annals of Allergy, Asthma & Immunology, 104*(1), 60-65. doi:10.1016/j.anai.2009.11.008

Shine, A., O'Reilly, S., & O'Sullivan, K. (1997). Consumer use of nutrition labels. *British Food Journal*, 99(8), 290-296. Retrieved from http://ezproxy.library.dal.ca/login?url=http://search.proquest.com/docview/225149535?accountid=10406

Sinclair, S., Hammond, D., & Goodman, S. (2013). Sociodemographic differences in the comprehension of nutritional labels on food products. *Journal of Nutrition Education and Behavior, 45*(6), 767-772. doi:10.1016/j.jneb.2013.04.262

Smith, S. C., Taylor, J. G., & Stephen, A. M. (2000). Use of food labels and beliefs about diet–disease relationships among university students. *Public Health Nutrition, 3*(2), 175-182. http://dx.doi.org/10.1017/S1368980000000203

Sonnenwald, D. (1999). Evolving perspectives of human information behaviour: contexts, situations, social networks and information horizons. In T. D. Wilson & D. Allen (Eds.), *Exploring the contexts of information behaviour. Proceedings of the 2nd International Conference on Research in Information Needs, Seeking and Use in Different Contexts, 13–15 August 1998, Sheffield, UK* (pp. 176–190). London: Taylor Graham.

Souiden, N., Abdelaziz, F. B., & Fauconnier, A. (2013). Nutrition labelling: Employing consumer segmentation to enhance usefulness. *Journal of Brand Management, 20*(4), 267-282. doi:10.1057/bm.2012.14

Statistics Canada. (2013, October 28). Individual Internet use and e-commerce, 2012. *The Daily*. Retrieved on November 12, 2014, from http://www.statcan.gc.ca/daily-quotidien/131028/dq131028a-eng.pdf

Statistics Canada. (2014, October 29). Body composition of adults, 2012 to 2013. Retrieved on November 13, 2014, from http://www.statcan.gc.ca/pub/82-625-x/2014001/article/14104-eng.htm

Steptoe, A., Pollard, T. M., & Wardle, J. (1995). Development of a measure of the motives underlying the selection of food: The food choice questionnaire. *Appetite, 25*(3), 267-284. doi:10.1016/j.socscimed.2007.11.021

Stewart, M., Makwarimba, E., Barnfather, A., Letourneau, N., & Neufeld, A. (2008). Researching reducing health disparities: Mixed-methods approaches. *Social Science and Medicine, 66*(6), 1406-1417.

Stigler, G. J. (1961). The economics of information. *Journal of Political Economy, 69*(3), 213-225. doi:10.1086/258464

Sutton, S. (2004). Determinants of health-related behaviours: Theoretical and methodological issues. In S. Sutton, A. Baum, & M. Johnston (Eds.), *The SAGE handbook of health psychology*, (pp. 94-126). London: Sage, 2004.

The Public Health Agency of Canada and the Canadian Institute for Health Information. (2011). *Obesity in Canada: A joint report from the Public Health Agency of Canada and the Canadian Institute for Health Information*. Retrieved on January

14, 2015, from http://www.phac-aspc.gc.ca.ezproxy.library.dal.ca/hp-ps/hl-mvs/oic-oac/index-eng.php

Varela, P., & Fiszman, S.M. (2013). Exploring consumers' knowledge and perceptions of hydrocolloids used as food additives and ingredients. *Food Hydrocolloids, 30*(1), 477-484. doi:10.1016/j.foodhyd.2012.07.001

Variyam, J. N. (2008). Do nutrition labels improve dietary outcomes?. *Health Economics, 17(*6), 695-708. doi:10.1002/hec.1287

Visschers, V. H. M., Hartmann, C., Leins-Hess, R., Dohle, S., & Siegrist, M. (2013). A consumer segmentation of nutrition information use and its relation to food consumption behaviour. *Food Policy, 42*, 71-80.

Visschers, V. H. M., Hess, R., & Siegrist, M. (2010). Health motivation and product design determine consumers' visual attention to nutrition information on food products. *Public Health Nutrition, 13*(7), 1099-1106. doi:10.1017/S1368980009993235

Wahlich, C., Gardner, B., & McGowan, L. (2013). How, when and why do young women use nutrition information on food labels? A qualitative analysis. *Psychology & Health, 28*(2), 202-216. doi:10.1080/08870446.2012.716439

Wansink, B., & Sobal, J. (2007). Mindless Eating: The 200 Daily Food Decisions We Overlook. *Environment and Behavior, 39*(1), 106-123. doi:10.1177/0013916506295573

Wilson, P. (1977). *Public knowledge, private ignorance.* Westport, CT: Greenwood Press.

Wilson, T. D. (1997). Information behaviour: An interdisciplinary perspective. *Information Processing and Management, 33*(4), 551-572. doi:10.1016/S0306-4573(97)00028-9

Wilson, T. D. (1999). Models in information behaviour research. *Journal of Documentation, 55*(3), 249-270. doi:10.1108/EUM0000000007145

Wilson, T. D. (2000). Human information behaviour. *Informing Science: The International Journal of an Emerging Transdiscipline, 3*(2), 49-55. http://inform.nu/Articles/Vol3/v3n2p49-56.pdf

Wilson, T. D. (2006). On user studies and information needs. *Journal of Documentation, 62*(6), 658-670. doi:10.1108/00220410610714895

Williamson, K. (1998). Discovered by chance: The role of incidental learning acquisition in an ecological model of information use. *Library and Information Science Research, 20*(1), 23–40. doi:10.1177/0961000607086616

Williamson, K., Qayyum, A., Hider, P., & Liu, Y.-H. (2012). Young adults and everyday-life information: The role of news media. *Library and Information Science Research, 34*(4), 258-264. doi:10.1016/j.lisr.2012.05.001

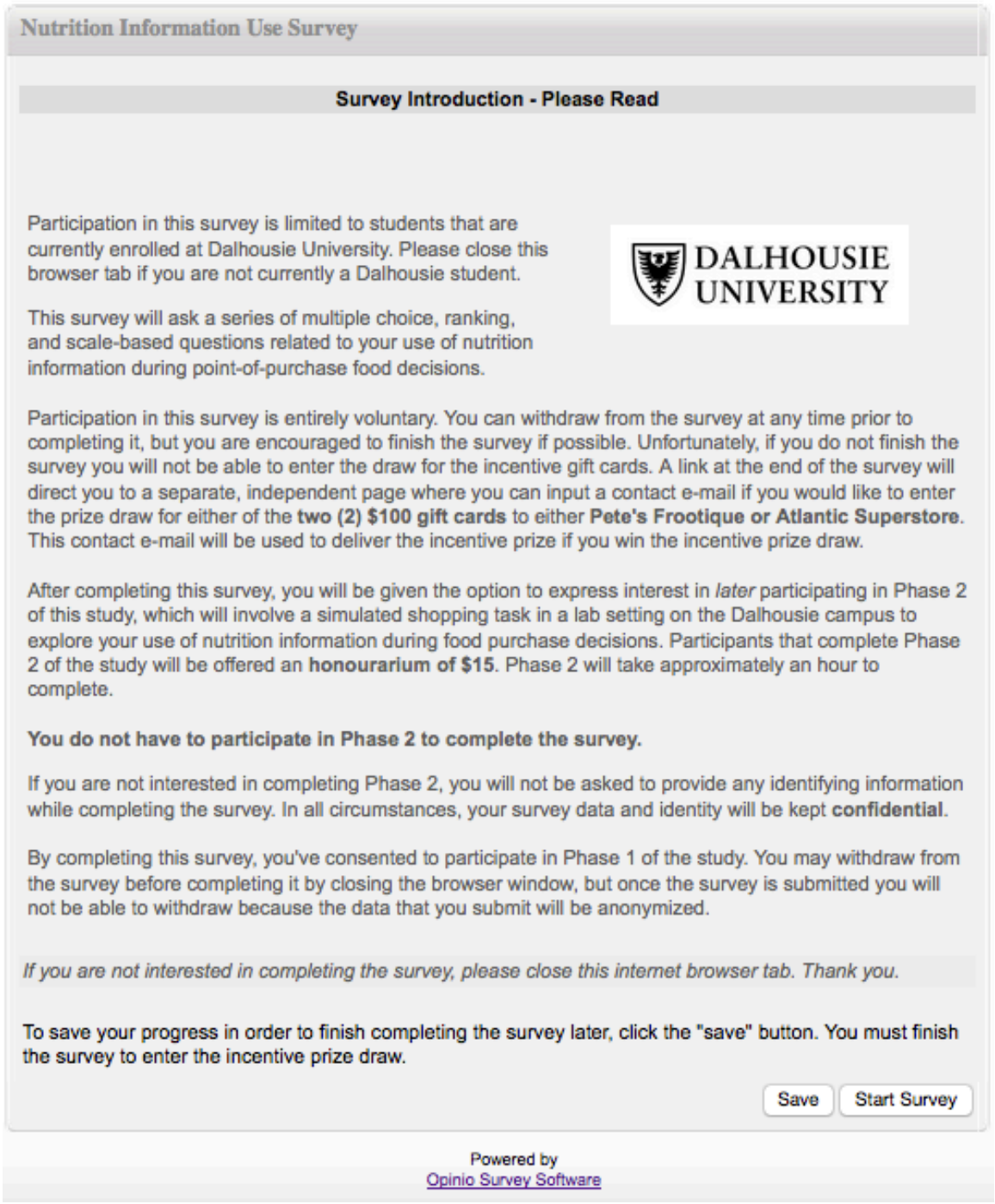
Wimberley, S. L., & McClean, J. L. (2012). Supermarket Savvy: The Everyday Information-Seeking Behavior of Grocery Shoppers. *Information and Culture, 47*(2), 176-205. doi:10.1353/lac.2012.0010

Winograd, M., & Hais, M. D. (2011). *Millennial momentum how a new generation is remaking America*. New Brunswick, N.J.: Rutgers University Press.

Worsley, A. (1996). Which nutrition information do shoppers want on food labels?. *Asia Pacific Journal of Clinical Nutrition, 5*(2), 70-78. Retrieved from http://apjcn.nhri.org.tw/server/APJCN/5/2/70.pdf

Appendix A – NUTRITION INFORMATION USE SURVEY

This survey was delivered using Opinio software. Each question, unless otherwise stated, required a single answer before participants could continue to the next question. Participants were allowed to go back to an earlier question if desired. Progress could be saved at any point. Question numbers were not shown to participants.



Nutrition Information Use Survey

Survey Introduction - Please Read

Participation in this survey is limited to students that are currently enrolled at Dalhousie University. Please close this browser tab if you are not currently a Dalhousie student.

DALHOUSIE UNIVERSITY

This survey will ask a series of multiple choice, ranking, and scale-based questions related to your use of nutrition information during point-of-purchase food decisions.

Participation in this survey is entirely voluntary. You can withdraw from the survey at any time prior to completing it, but you are encouraged to finish the survey if possible. Unfortunately, if you do not finish the survey you will not be able to enter the draw for the incentive gift cards. A link at the end of the survey will direct you to a separate, independent page where you can input a contact e-mail if you would like to enter the prize draw for either of the **two (2) $100 gift cards** to either **Pete's Frootique or Atlantic Superstore**. This contact e-mail will be used to deliver the incentive prize if you win the incentive prize draw.

After completing this survey, you will be given the option to express interest in *later* participating in Phase 2 of this study, which will involve a simulated shopping task in a lab setting on the Dalhousie campus to explore your use of nutrition information during food purchase decisions. Participants that complete Phase 2 of the study will be offered an **honourarium of $15**. Phase 2 will take approximately an hour to complete.

You do not have to participate in Phase 2 to complete the survey.

If you are not interested in completing Phase 2, you will not be asked to provide any identifying information while completing the survey. In all circumstances, your survey data and identity will be kept **confidential**.

By completing this survey, you've consented to participate in Phase 1 of the study. You may withdraw from the survey before completing it by closing the browser window, but once the survey is submitted you will not be able to withdraw because the data that you submit will be anonymized.

If you are not interested in completing the survey, please close this internet browser tab. Thank you.

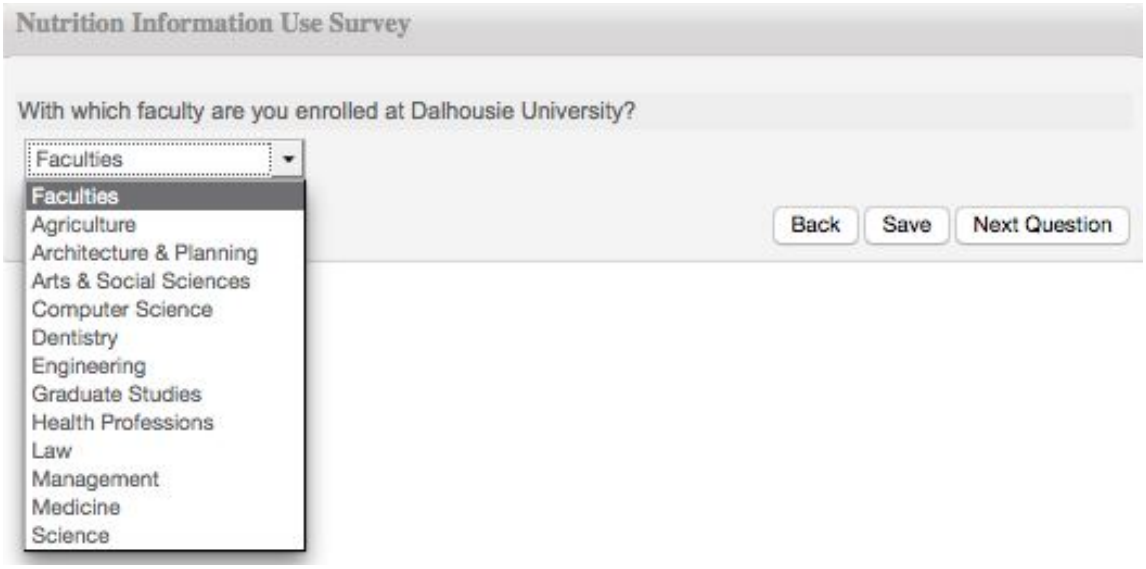
To save your progress in order to finish completing the survey later, click the "save" button. You must finish the survey to enter the incentive prize draw.

Save Start Survey

Powered by
Opinio Survey Software

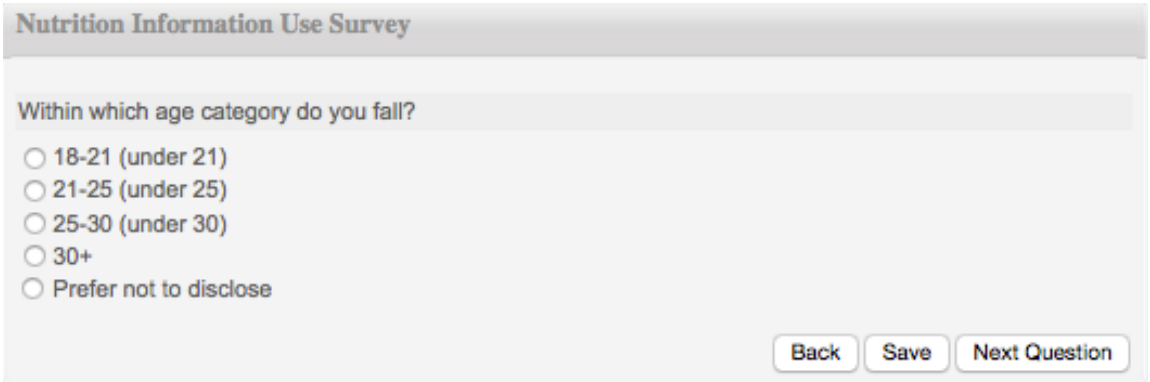
Part 1: Demographic Information

1.



2.

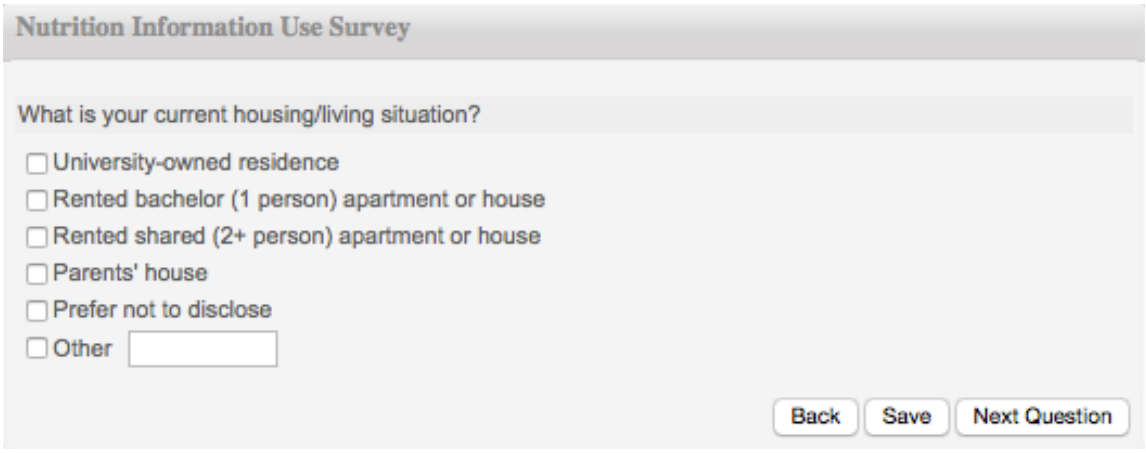
3.



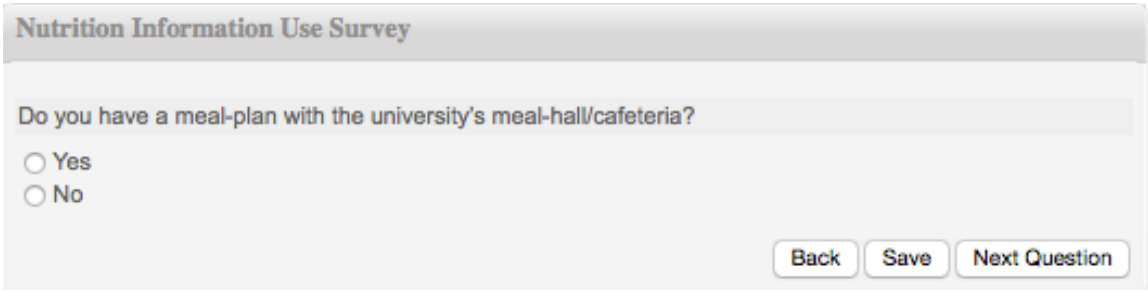
4.


Nutrition Information Use Survey
What gender do you most associate with?
Female
Male
Other
Prefer not to disclose
Back
Save
Next Question

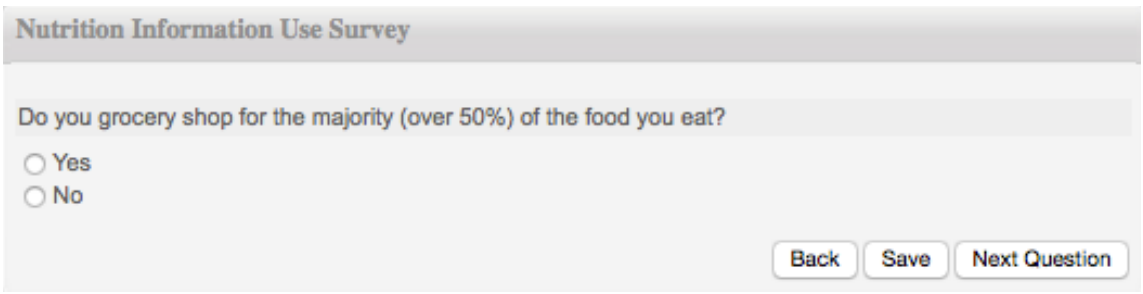
5.


Nutrition Information Use Survey
What is your current housing/living situation?
University-owned residence
Rented bachelor (1 person) apartment or house
Rented shared (2+ person) apartment or house
Parents' house
Prefer not to disclose
Other
Back
Save
Next Question

6.


Nutrition Information Use Survey
Do you have a meal-plan with the university's meal-hall/cafeteria?
Yes
No
Back
Save
Next Question

7.


Nutrition Information Use Survey
Do you grocery shop for the majority (over 50%) of the food you eat?
Yes
No
Back
Save
Next Question

8.

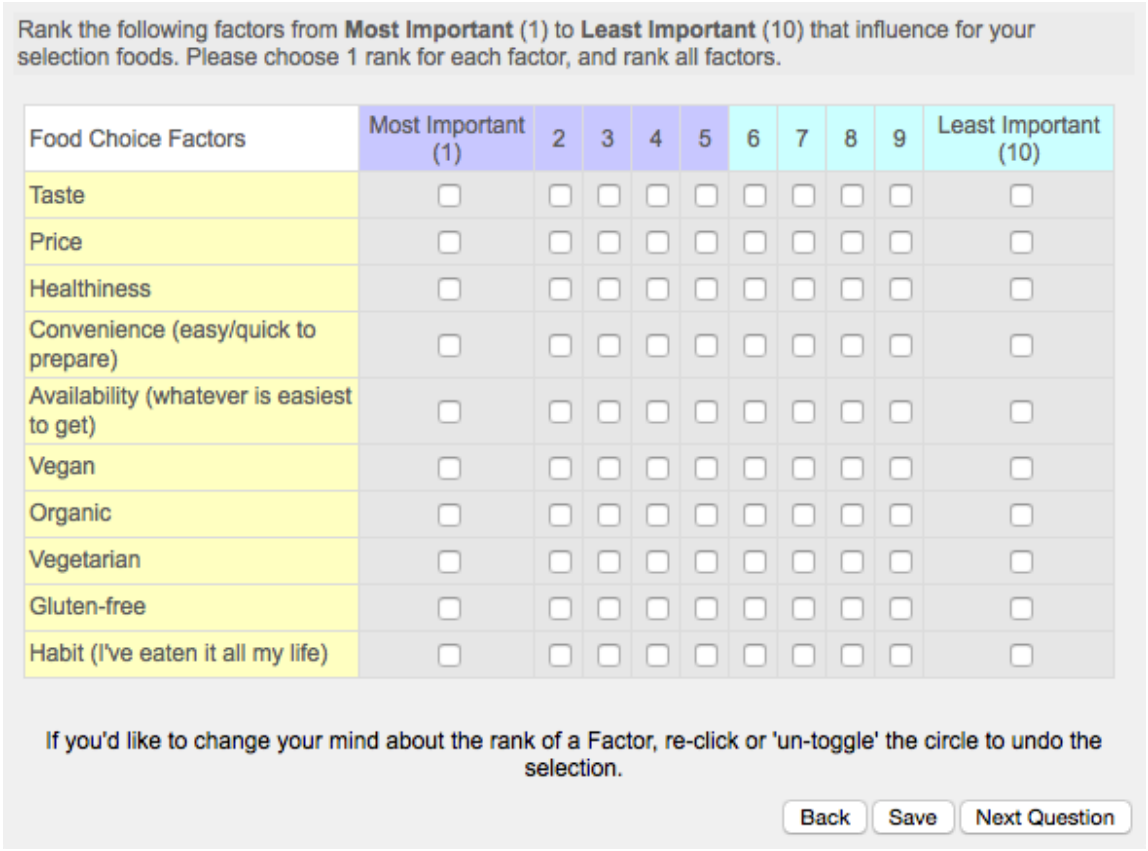
Nutrition Information Use Survey

How often do you shop for groceries?

- ○ Never
- ○ Rarely (less than once per month)
- ○ More than once per month but less than once per week
- ○ At least once per week
- ○ Several times per week

Back | Save | Next Question

9.



Rank the following factors from **Most Important** (1) to **Least Important** (10) that influence for your selection foods. Please choose 1 rank for each factor, and rank all factors.

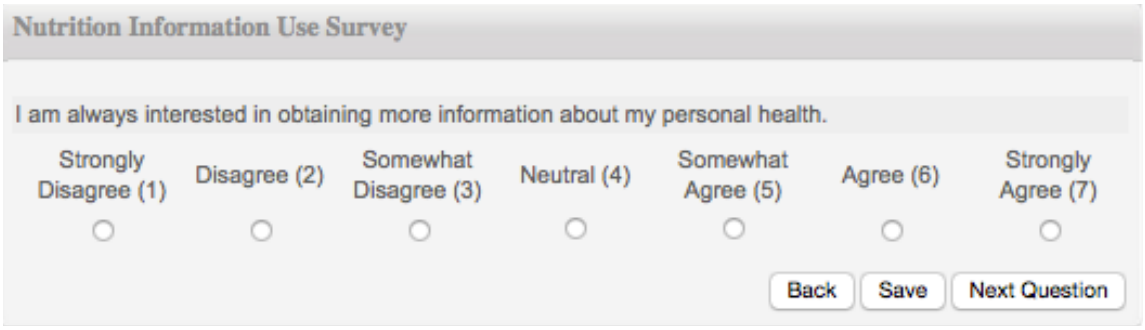
Food Choice Factors	Most Important (1)	2	3	4	5	6	7	8	9	Least Important (10)
Taste	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Price	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Healthiness	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Convenience (easy/quick to prepare)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Availability (whatever is easiest to get)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Vegan	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Organic	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Vegetarian	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Gluten-free	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Habit (I've eaten it all my life)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

If you'd like to change your mind about the rank of a Factor, re-click or 'un-toggle' the circle to undo the selection.

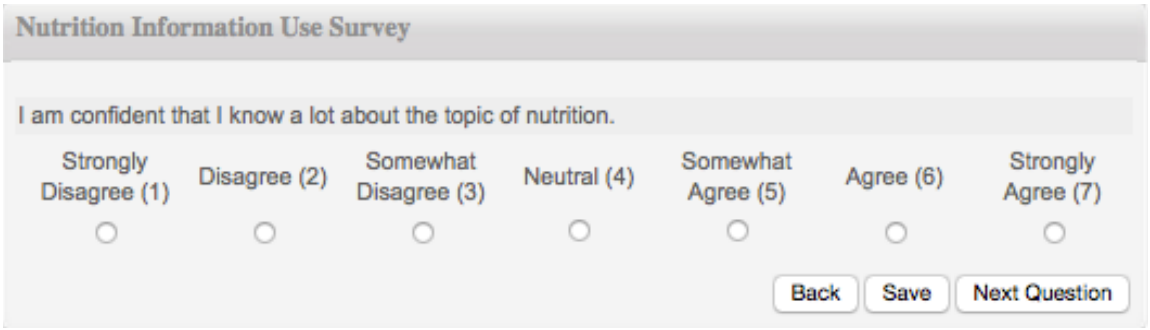
Back | Save | Next Question

Part 2 – Nutrition Knowledge & Health Consciousness

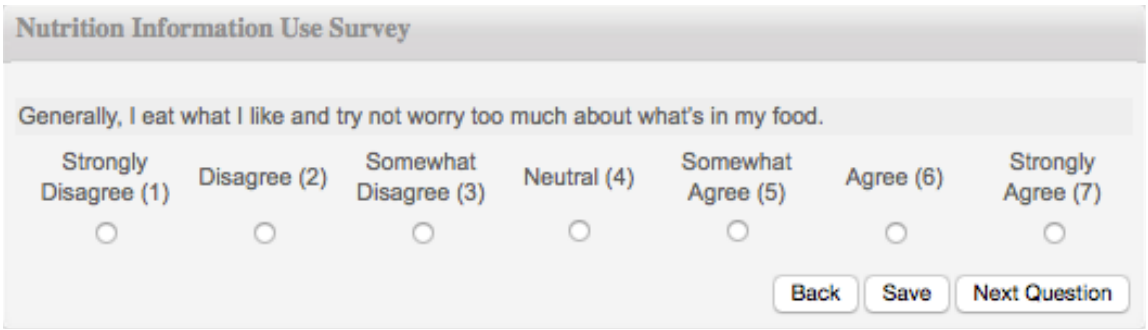
10.



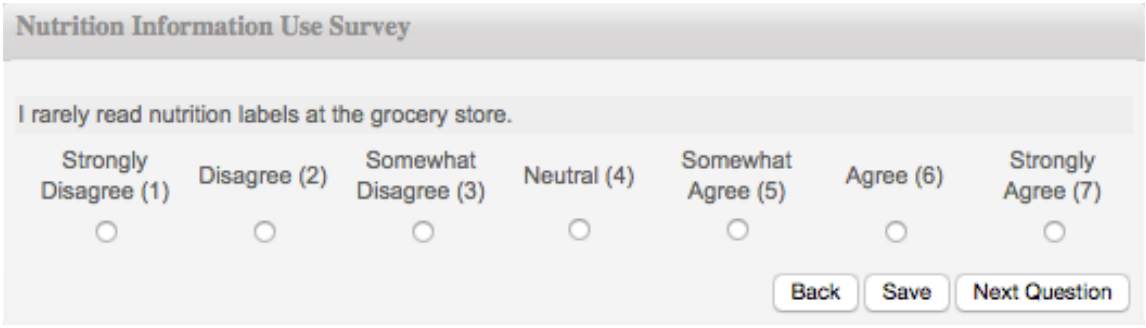
11.



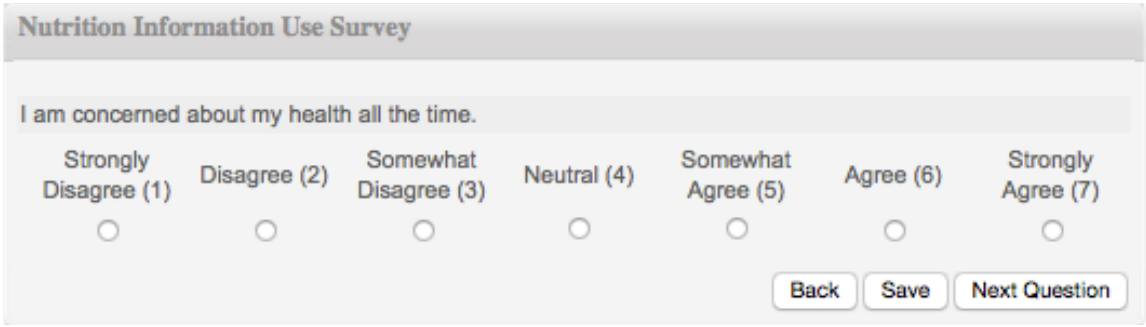
12.



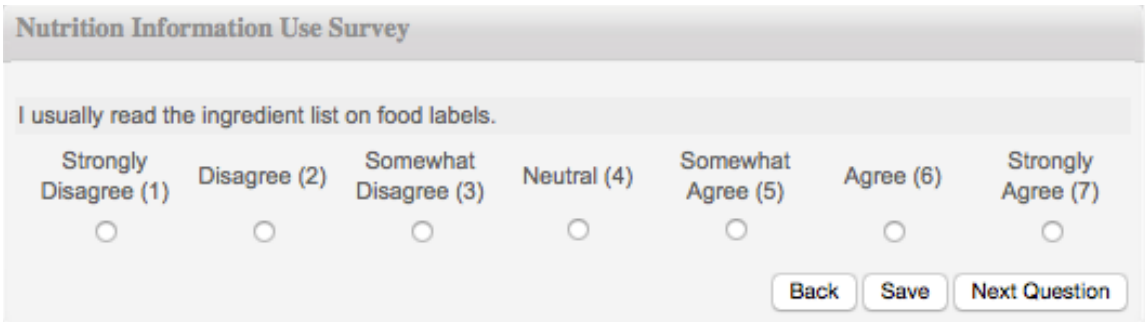
13.


Nutrition Information Use Survey
I rarely read nutrition labels at the grocery store.
Strongly Disagree (1)
Disagree (2)
Somewhat Disagree (3)
Neutral (4)
Somewhat Agree (5)
Agree (6)
Strongly Agree (7)
Back
Save
Next Question

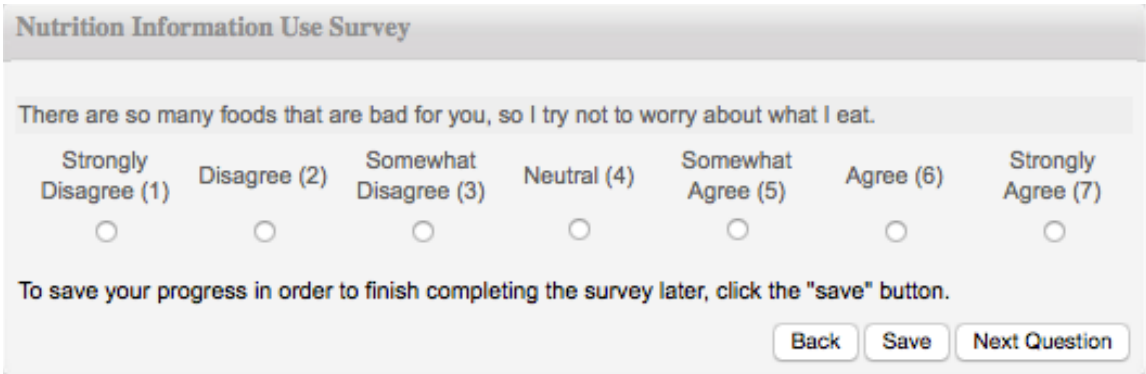
14.


Nutrition Information Use Survey
I am concerned about my health all the time.
Strongly Disagree (1)
Disagree (2)
Somewhat Disagree (3)
Neutral (4)
Somewhat Agree (5)
Agree (6)
Strongly Agree (7)
Back
Save
Next Question

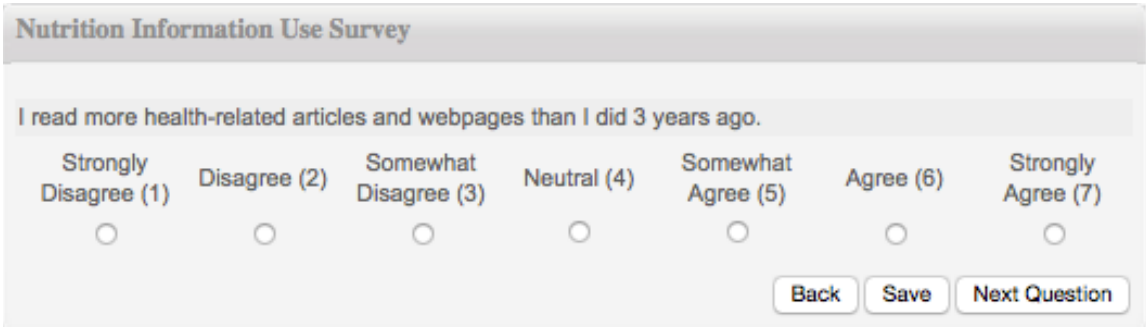
15.


Nutrition Information Use Survey
I usually read the ingredient list on food labels.
Strongly Disagree (1)
Disagree (2)
Somewhat Disagree (3)
Neutral (4)
Somewhat Agree (5)
Agree (6)
Strongly Agree (7)
Back
Save
Next Question

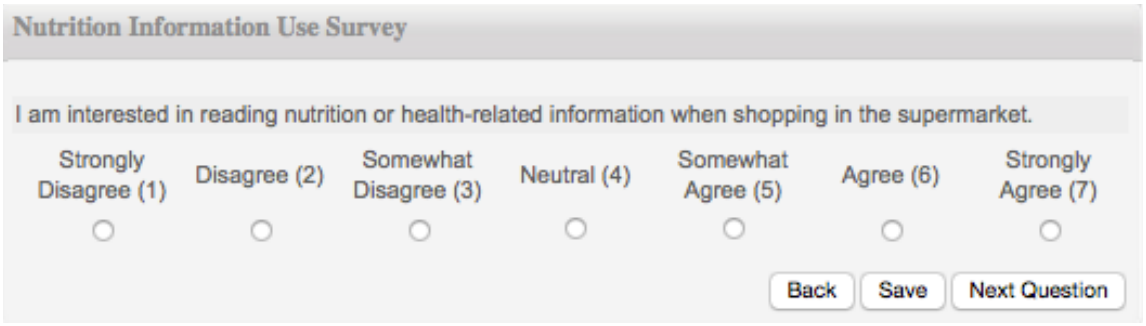
16.


Nutrition Information Use Survey
There are so many foods that are bad for you, so I try not to worry about what I eat.
Strongly Disagree (1)
Disagree (2)
Somewhat Disagree (3)
Neutral (4)
Somewhat Agree (5)
Agree (6)
Strongly Agree (7)
To save your progress in order to finish completing the survey later, click the "save" button.
Back
Save
Next Question

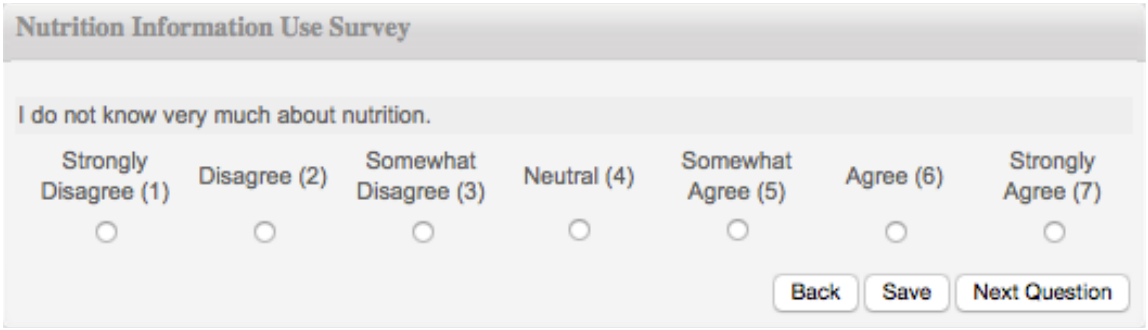
17.


Nutrition Information Use Survey
I read more health-related articles and webpages than I did 3 years ago.
Strongly Disagree (1)
Disagree (2)
Somewhat Disagree (3)
Neutral (4)
Somewhat Agree (5)
Agree (6)
Strongly Agree (7)
Back
Save
Next Question

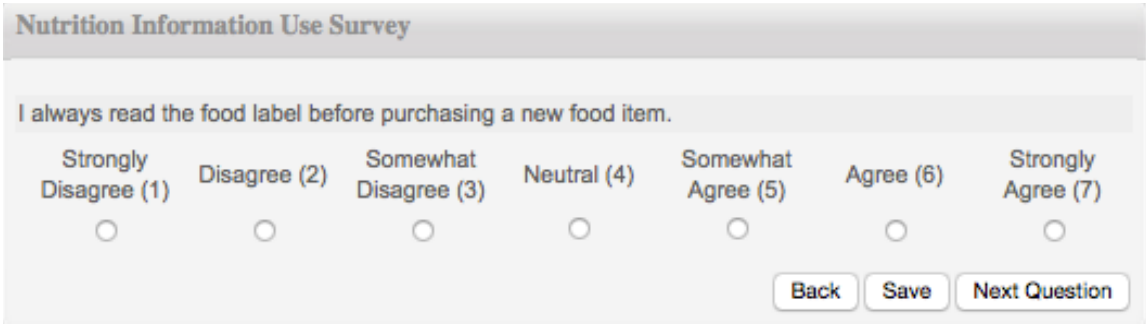
18.


Nutrition Information Use Survey
I am interested in reading nutrition or health-related information when shopping in the supermarket.
Strongly Disagree (1)
Disagree (2)
Somewhat Disagree (3)
Neutral (4)
Somewhat Agree (5)
Agree (6)
Strongly Agree (7)
Back
Save
Next Question

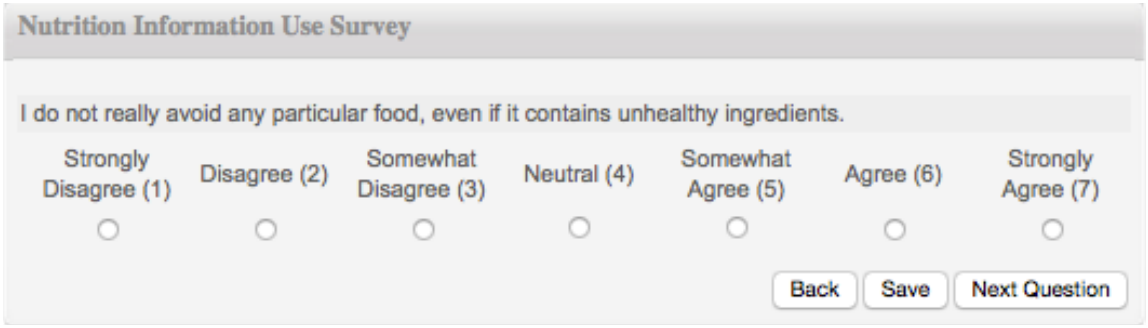
19.


Nutrition Information Use Survey
I do not know very much about nutrition.
Strongly Disagree (1)
Disagree (2)
Somewhat Disagree (3)
Neutral (4)
Somewhat Agree (5)
Agree (6)
Strongly Agree (7)
Back
Save
Next Question

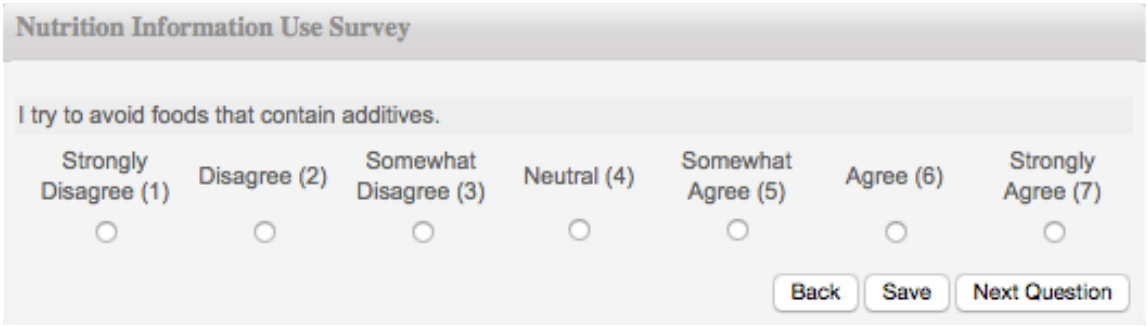
20.


Nutrition Information Use Survey
I always read the food label before purchasing a new food item.
Strongly Disagree (1)
Disagree (2)
Somewhat Disagree (3)
Neutral (4)
Somewhat Agree (5)
Agree (6)
Strongly Agree (7)
Back
Save
Next Question

21.

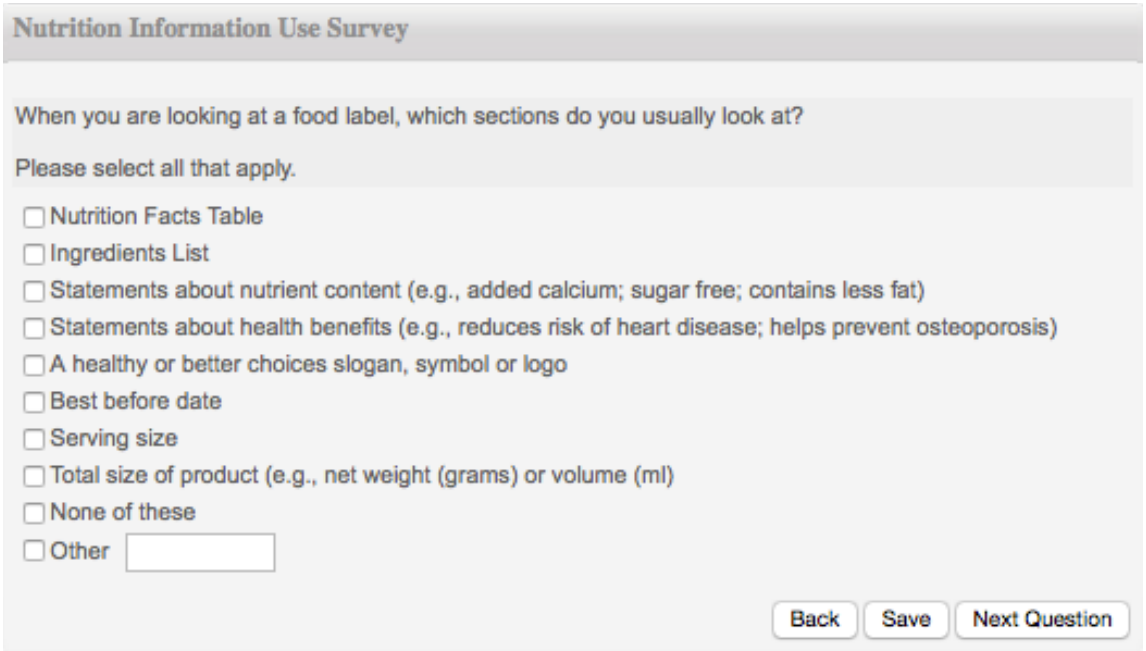


22.



Part 3: Food Label Use

23.



24.

Rank the following food label components from the **most important** (1) to the **least important** (8) to you when you are deciding whether or not to buy a food item in the supermarket.

Please give a different rank to each component.

Food Label Components	1 (Most Important)	2	3	4	5	6	7	8 (Least Important)
Claims about Nutrient Content	☐	☐	☐	☐	☐	☐	☐	☐
Nutrition Facts Table	☐	☐	☐	☐	☐	☐	☐	☐
Ingredient List	☐	☐	☐	☐	☐	☐	☐	☐
"Healthy Choice" Symbol or Logo	☐	☐	☐	☐	☐	☐	☐	☐
'Best before' date	☐	☐	☐	☐	☐	☐	☐	☐
Claims about Health Benefits	☐	☐	☐	☐	☐	☐	☐	☐
Total Size of Product	☐	☐	☐	☐	☐	☐	☐	☐
Serving Size	☐	☐	☐	☐	☐	☐	☐	☐

If you'd like to change your mind about the rank of a Food Label Component, re-click or 'un-toggle' the circle to undo the selection.

Back Save Next Question

Part 4: Ingredient List Information Use

25.

Nutrition Information Use Survey

Have you ever looked at an ingredient list to make sure a particular ingredient **was contained** in a product you were considering purchasing?

○ Yes
○ No

Back Save Next Question

26.

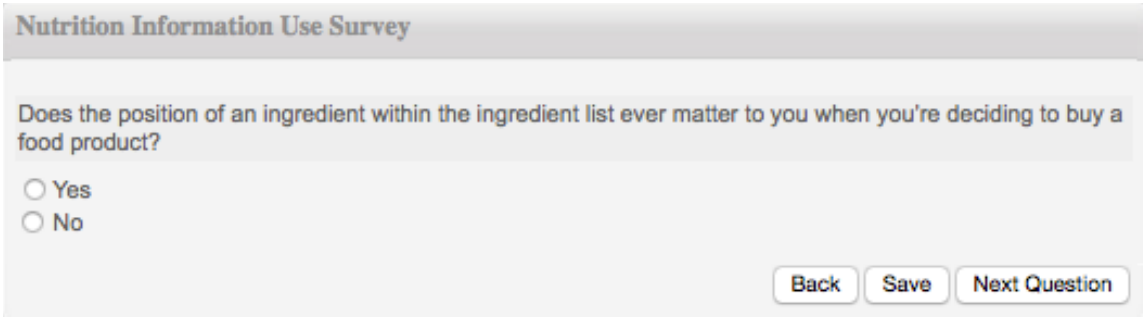
Nutrition Information Use Survey

Have you ever looked at an ingredient list to make sure a particular ingredient **was not** in a product that you were considering purchasing?

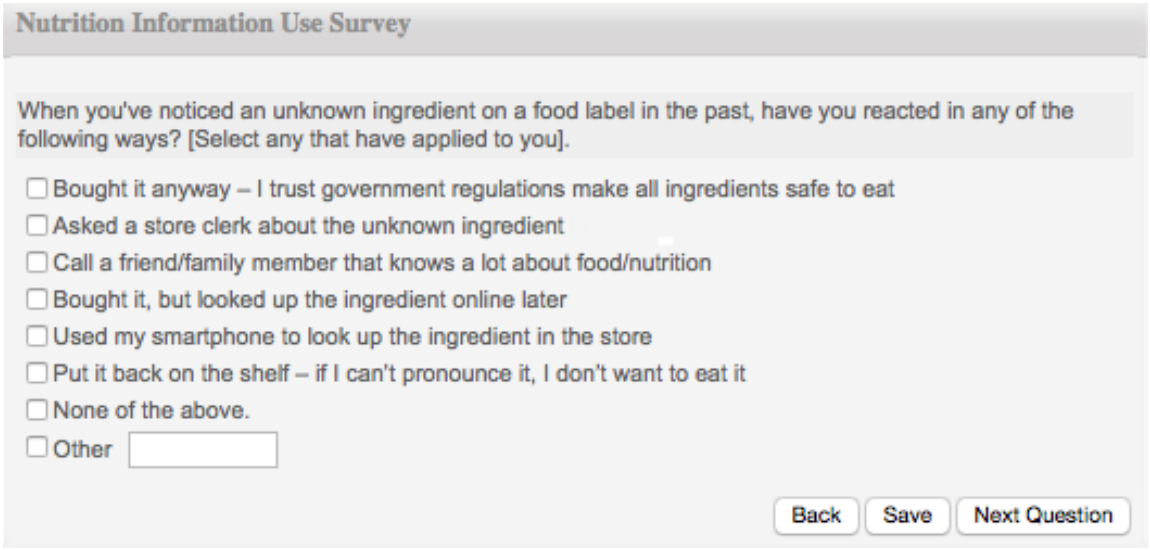
○ Yes
○ No

Back Save Next Question

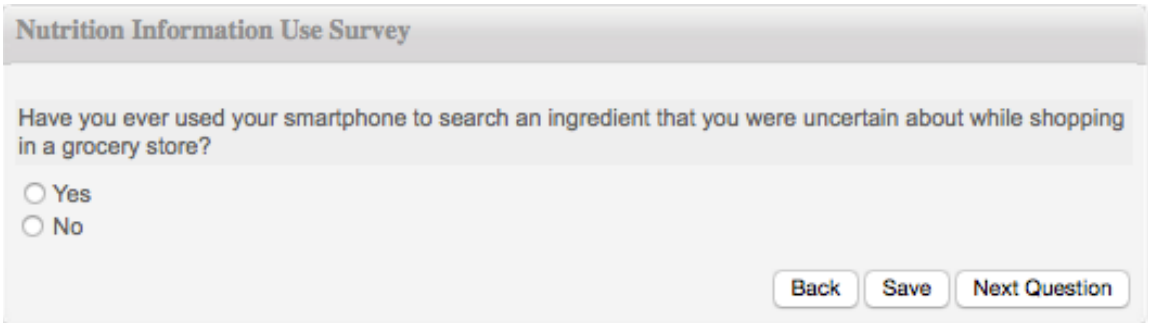
27.


Nutrition Information Use Survey
Does the position of an ingredient within the ingredient list ever matter to you when you're deciding to buy a food product?
Yes
No
Back
Save
Next Question

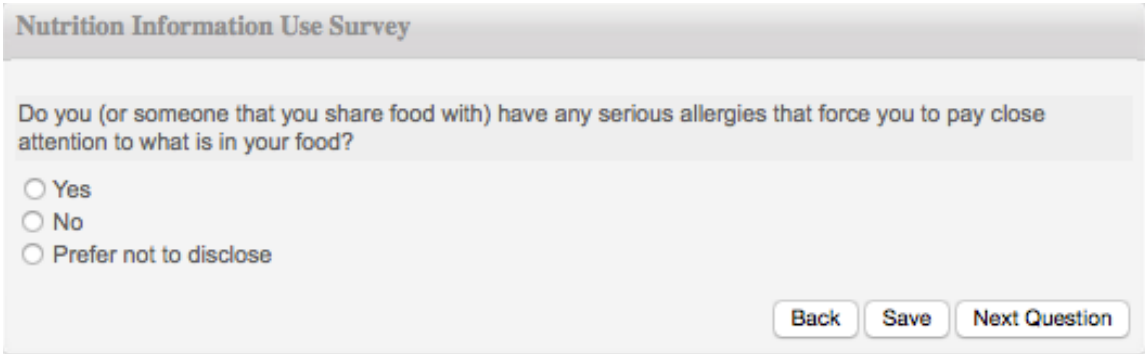
28.


Nutrition Information Use Survey
When you've noticed an unknown ingredient on a food label in the past, have you reacted in any of the following ways? [Select any that have applied to you].
Bought it anyway – I trust government regulations make all ingredients safe to eat
Asked a store clerk about the unknown ingredient
Call a friend/family member that knows a lot about food/nutrition
Bought it, but looked up the ingredient online later
Used my smartphone to look up the ingredient in the store
Put it back on the shelf – if I can't pronounce it, I don't want to eat it
None of the above.
Other
Back
Save
Next Question

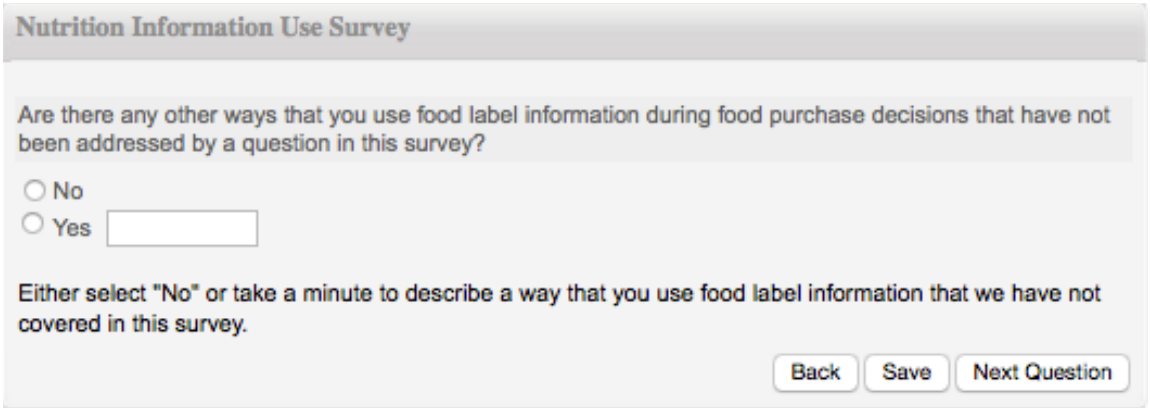
29.


Nutrition Information Use Survey
Have you ever used your smartphone to search an ingredient that you were uncertain about while shopping in a grocery store?
Yes
No
Back
Save
Next Question

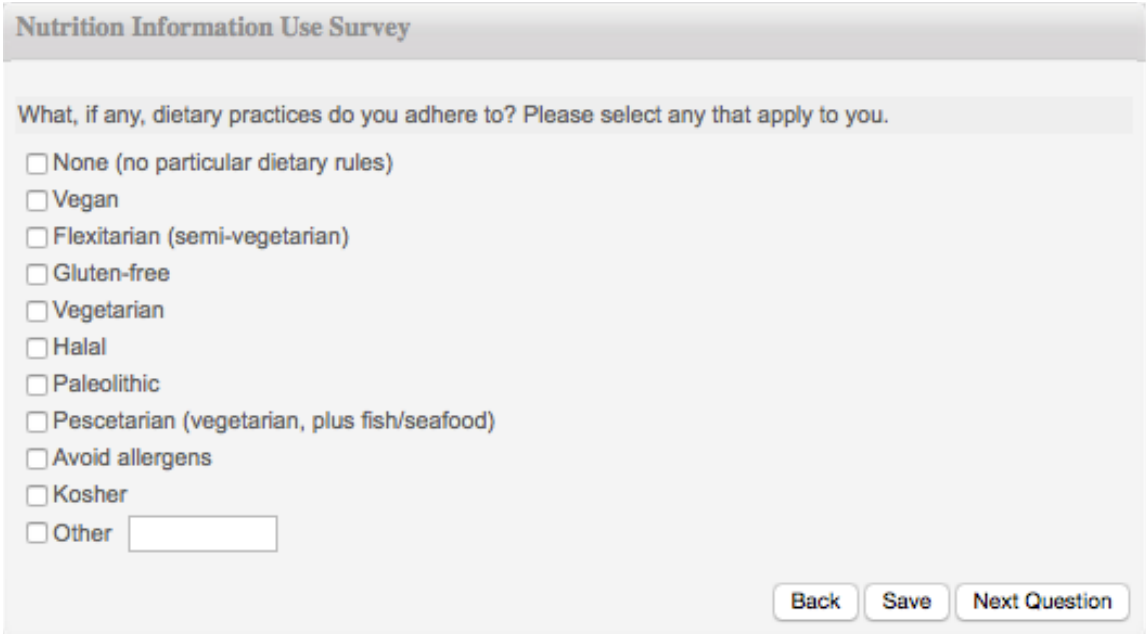
30.


Nutrition Information Use Survey
Do you (or someone that you share food with) have any serious allergies that force you to pay close attention to what is in your food?
Yes
No
Prefer not to disclose
Back
Save
Next Question

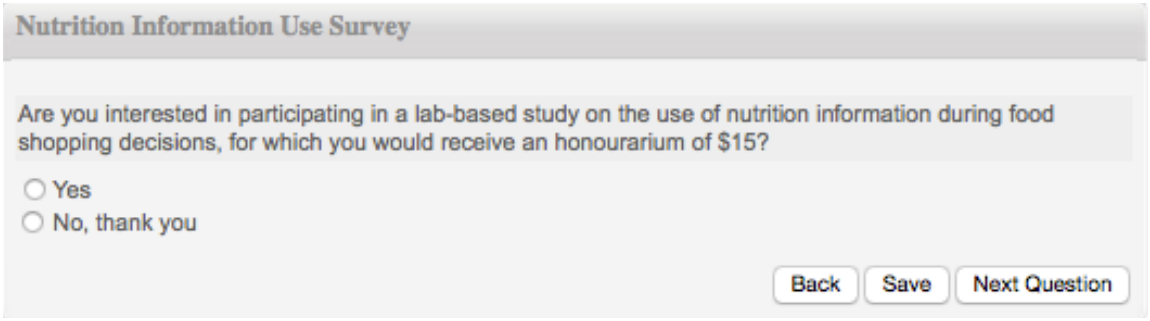
31.


Nutrition Information Use Survey
Are there any other ways that you use food label information during food purchase decisions that have not been addressed by a question in this survey?
No
Yes
Either select "No" or take a minute to describe a way that you use food label information that we have not covered in this survey.
Back
Save
Next Question

32.

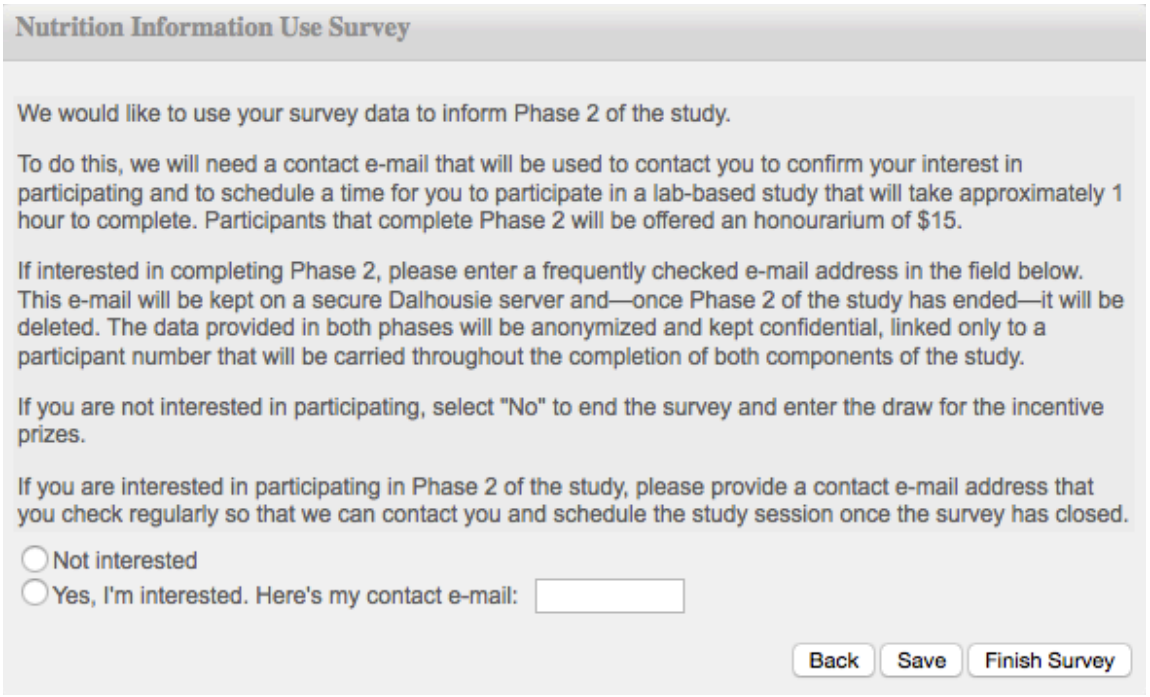

Nutrition Information Use Survey
What, if any, dietary practices do you adhere to? Please select any that apply to you.
None (no particular dietary rules)
Vegan
Flexitarian (semi-vegetarian)
Gluten-free
Vegetarian
Halal
Paleolithic
Pescetarian (vegetarian, plus fish/seafood)
Avoid allergens
Kosher
Other
Back
Save
Next Question

33.



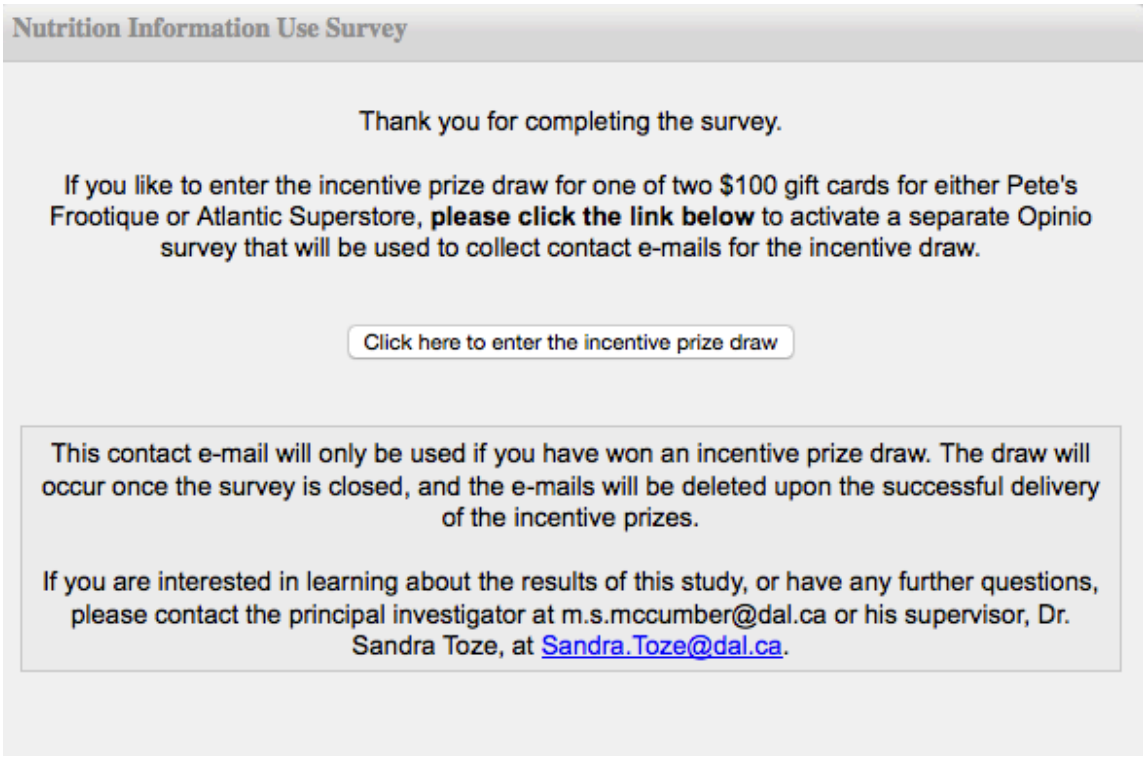
Upon selecting "No, thank you" for Question #33, participants will be directed to the Survey Thank You Screen, effectively skipping Question #34.

33a.



Upon selecting "Finish Survey" for Question #33a, survey participants will be directed to the Survey Thank You Screen.

[Thank You – Completed]



Survey participants have the option of clicking the link to a second Incentive Prize Draw Survey delivered using Opinio software. A script was installed to prevent any individuals from copying the link and skipping directly to the Incentive Prize Draw Survey.

Appendix B – PHASE 2 SCRIPT

– PRE-TASK BRIEF –

***Introduction**

"The purpose of this project is to explore how people use the information provided on food labels to make purchase decisions in the supermarket."

- Audio recorded for accuracy
- You will not be addressed by name during the session – confidentiality

What you will do:

- Pre-packaged food products
- Make a series of decisions related to these products

"Imagine yourself to be shopping in a super market…"

- You've got your smartphone with you…
- Any other resources you use to make purchase decisions

"I would like you to tell me what you're thinking when you're making these decisions, as much as possible." Essentially, please say anything you think."

What I'll do:

- Ask clarifying questions about your decisions

*There are no right answers – we are interested in everything you have to say"

- No obligation to answer questions if you feel uncomfortable
    - As health/nutrition can be a sensitive topic
    - But you're encouraged to answer every question
    - Additional benefit of becoming aware of nutrition info behaviour

You may withdraw from the study at any point, though once your session is finished and the data has been processed and anonymized, it will not be possible to withdraw the data that you've submitted.

Remember that:

- Encouraged to re-examine the products at any point during the session
- Use your smartphone during the session to help you make your decisions
- Information provided confidential and anonymized

You will be offered an honourarium of $15 as an expression of gratitude.

- Asked to sign a receipt at the end of the study

"If you're still interested in completing this phase of the study, please read and sign this consent form so that we can begin."

TURN AUDIO RECORDER ON! **TURN AUDIO RECORDER ON!**

– PHASE 2 –

"Please take a few moments to examine the products."

Step 1: Have you purchased any of these products before?

*Remember to walk me through your decision-making

*Re-examine products

Step 2: Which of these 6 products would you consider purchasing?

Step 3: Within each product type which would you purchase if you had to purchase just one option?

- What information did you base this decision on? [for each type]

Step 4: Within each product type, which option is healthier? *[Reminder]*

- What information did you base this decision on? [for each type]

Step 5: Is there any information on any of these labels that you are unsure about? Please re-examine these products and indicate what information, if any, you are unsure about.

Step 6: Here are 3 ingredients, search them with your smart-phone to find out what they are:

a. Tocopherols b. Calcium Chloride c. Hydrolyzed corn protein

*Now that you've searched [each], would you still consider eating it?

When using smartphone:

What type information are you looking for?

What search engine/tool are you using?

What webpage did you find that gave you the right information?

Debrief - Thank you

If you are interested in learning about the results of the study, or decide later that you would like to withdraw from the study, please feel free to contact my faculty supervisor, Dr. Sandra Toze or myself.

We would like to offer you an honourarium of $15 as an expression of gratitude. To receive this honourarium, please sign this receipt for our records, indicating that you have received this honourarium.

Once again, thank you for participating. Please do not hesitate to contact either of us if you have any questions or are interested in learning about the results of the study.

Have a nice day.

Appendix C – SCREENING TOOL

The following table summarizes the allotment of points per NIU Survey response. For responses to the scale-based questions from Part 2 of the NIU Survey, participants were allotted a maximum of 7 points for the response most indicative of the highest level of concern with ingredient information, decreasing by intervals of 1 for each response less indicative of concern with ingredient information. For responses to questions from Part 3 of the NIU Survey, 20 points were allocated for responses selecting the 'Ingredient List'.

NIU SURVEY QUESTION #	POINTS ALLOTTED PER RESPONSE						
	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neutral (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
NIU Question 10	1	2	3	4	5	6	7
NIU Question 12	7	6	5	4	3	2	1
NIU Question 13	7	6	5	4	3	2	1
NIU Question 15	1	2	3	4	5	6	7
NIU Question 16	7	6	5	4	3	2	1
NIU Question 20	1	2	3	4	5	6	7
NIU Question 21	7	6	5	4	3	2	1
NIU Question 22	1	2	3	4	5	6	7
NIU Question 23	20 points for selecting the 'Ingredient List'						
NIU Question 24	20 points for ranking the 'Ingredient List' as the 'Most Important (1)' factor						

Corresponding Statements

10. I am always interested in obtaining more information about my personal health.
12. Generally, I eat what I like and try not to worry much about what's in my food.
13. I rarely read nutrition labels at the grocery store*
15. I usually read the ingredient list on food labels.
16. There are so many foods that are bad for you, so I try not to worry about what I eat.
20. I always read the food label before purchasing a new food item.
21. I do not really avoid any particular food, even when it contains unhealthy ingredients.
22. I try to avoid foods that contain additives.
23. When you are looking at a food label, which sections do you usually look at?
24. Rank the following food label components from the '**Most important** (1)' to the **least important** (8) to you when… deciding… to buy a food item in the supermarket.

APPENDIX D – SURVEY ADVERTISEMENT E-MAIL MESSAGE

**E-mail messages were occasionally personalized in an effort to appeal to a contact when the name was known, as provided on the DSU database of Student Societies, accessible at https://tigersociety.dsu.ca/Organizations*

Good afternoon [Contact],

My name is Mark McCumber, and I am conducting a survey as part of my thesis project in the completion of a Master of Library and Information Studies (MLIS) degree. This survey has been approved for distribution by the Dalhousie University Ethics board.

The survey concerns the use of nutrition information from food labels to make purchase and consumption decisions, focusing on students enrolled at Dalhousie University.

This behaviour relates to all individuals to varying degrees, so I am hoping to collect the broadest possible sample so as to be representative of the Dalhousie student population.

As students that have committed to studying the environment, I am very interested in the perspectives of your peers, who must have an interesting and unique perception of food consumption and the environment.

You are in a position to help spread awareness about this survey within your network of Dalhousie students. It would be greatly appreciated if you would forward this email throughout your organizations' email list and, if you would be so kind, to post the message provided below on your student society's Facebook wall, if one exists.

Those that complete the survey can enter an incentive prize draws for one of two $100 gift cards to Pete's Frootique and Atlantic Superstore.

Thank you for your help!

Mark

Mark S. McCumber
MLIS Candidate (2015) | Dalhousie University

Please delete this introductory message and just forward/post the recruitment message below.
Do not worry about posting the Dal logo to Facebook. Thank you :)

DALHOUSIE UNIVERSITY
FACULTY OF MANAGEMENT

Dalhousie Student Participants Needed!

Complete a **short survey** to enter a draw for one of **two $100 gift card** to Atlantic Superstore or Pete's!

If you are a student enrolled at Dalhousie University, we would like to offer you the opportunity to complete in a short survey (15-25 minutes) on your use of food labels. This study is an attempt to better understand consumers' use of nutrition information during food shopping purchase decisions.

Participation is **voluntary** and your input would be very much appreciated.

No identifying information is required to complete the survey.
The survey will inform a thesis project as part of a Master of Library and Information Studies degree at Dalhousie University. This survey is the first component of a two-part study. Those that complete the survey are not required to participate in Phase 2.

To complete the survey, click the link below:
https://surveys.dal.ca/opinio/s?s=NutritionInfoUseSurvey

If you have any questions about this research, please contact Mark McCumber at m.s.mccumber@dal.ca, or his supervisor, Dr. Sandra Toze, at Sandra.Toze@dal.ca.

If you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact the Director, Research Ethics, Dalhousie University at (902) 494-1462, ethics@dal.ca.

APPENDIX E – FACEBOOK RECRUITMENT POST

Dalhousie Student Participants Needed!

Complete a short survey to enter a draw for one of two $100 gift card to Atlantic Superstore or Pete's!

If you are a student enrolled at Dalhousie University, we would like to offer you the opportunity to complete in a short survey (15-25 minutes) on your use of food labels. This study is an attempt to better understand consumers' use of nutrition information during food shopping purchase decisions.

Participation is voluntary and your input would be very much appreciated.
No identifying information is required to complete the survey.

The survey will inform a thesis project as part of a Master of Library and Information Studies degree at Dalhousie University. This survey is the first component of a two-part study. Those that complete the survey are not required to participate in Phase 2.

To complete the survey, click the link below:
https://surveys.dal.ca/opinio/s?s=NutritionInfoUseSurvey

If you have any questions about this research, please contact Mark McCumber at m.s.mccumber@dal.ca, or his supervisor, Dr. Sandra Toze, at Sandra.Toze@dal.ca.

If you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact the Director, Research Ethics, Dalhousie University at (902) 494-1462, ethics@dal.ca.

APPENDIX F – BULLETIN RECRUITMENT POSTER

DALHOUSIE UNIVERSITY
FACULTY OF MANAGEMENT

DALHOUSIE STUDENT PARTICIPANTS NEEDED!

Complete a **short survey** to enter a draw for one of **two $100 gift card** to Atlantic Superstore or Pete's (2 gift card winners will be drawn)!

If you are a student enrolled at Dalhousie University, we would like to offer you the opportunity to complete in a short survey (15-25 minutes) on your use of food labels. This study is an attempt to better understand consumers' use of nutrition information during food shopping purchase decisions.

Participation is **voluntary** and your input would be very much appreciated.

No identifying information is required to complete the survey.

To complete the survey, go to this link:

https://surveys.dal.ca/opinio/s?s=NutritionInfoUseSurvey

Feel free to take a picture of this poster an input the link at home, complete the survey now via smartphone, or to take a paper tab with the survey web address at the bottom of the poster!

This survey is part of a thesis project for a Master of Library & Information Studies (MLIS) degree at Dalhousie University. It is the first phase of a two-part study. Those that complete the survey do not have to participate in Phase 2.

If you have any questions about this research, please contact Mark McCumber at m.s.mccumber@dal.ca, or the project supervisor, Dr. Sandra Toze, at Sandra.Toze@dal.ca.

If you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact the Director, Research Ethics, Dalhousie University at (902) 494-1462, ethics@dal.ca.

https://surveys.dal.ca/opinio/s?s=NutritionInfoUseSurvey

APPENDIX G – RECRUITMENT DETAILS

Contact	E-mail Address
Ranjith Kumar Murugesan - DAGS Director 1	director1@dags.ca
Jim Boyle - DAGS Director 2	director2@dags.ca
Corey Smith - DAGS Director 3	director3@dags.ca
Logan Lawrence - DAGS Director 4	director4@dags.ca
Dalhousie Management Society (Undergrad)	mgmtsoc@dal.ca
Dalhousie Student Union Sustainability Office (DSUSO)	DSUSO@dal.ca
Dalhousie Students Association of Health Sciences	fl694462@dal.ca
School of Information Management Students' Association	simsa@dal.ca
SRES Student Society	sres@dal.ca
Dalhousie Public Administration Student Society	james.rothwell@dal.ca
School of Social Work Student Group (SSWSG)	swsg14@dal.ca
Environmental Programs Student Society	EPSS@dal.ca
Dalhousie Science Society	dss@dal.ca
Dalhousie Association of Psychology Students (DAPS)	daps@dal.ca
Dalhousie Association of Graduate Students in Psychology	dagsip@dal.ca
Dalhousie Undergraduate Physics Society (DUPS)	marc.cormier@dal.ca
Dalhousie Graduate Physics Society (DGPS)	dgps@dal.ca
Dalhousie Oceanography Students Association	clark.richards@dal.ca
Dalhousie Oceanography Undergraduate Society	dal.oceans@gmail.com
Undergraduate Neuroscience Society	uns@dal.ca
Society of Microbiology and Immunology Students	impss@dal.ca
Mathematics and Statistics Graduate Student Association	ms.grads@mathstat.dal.ca
Dalhousie Undergraduate Mathematics & Statistics Society	justine.gauthier@dal.ca
Dalhousie Association of Marine Biology Students	daldams1213@gmail.com
Undergraduate Economics Students Association	daleconomics@gmail.com
Earth Science Undergraduate Dawson Geology Club	Dawsongeology@gmail.com
Dawson Geology Graduate Society	stefanie.w@Dal.Ca
Dalhousie University Undergraduate Chemistry Society	leanne.chapman@dal.ca
Dalhousie Association of Biology Students (DABS):	dabs@dal.ca
Dalhousie Biochemistry Student Society	dbss@dal.ca
Dalhousie Undergraduate Political Science Society	dalpoli@gmail.com

Dalhousie Canadian Studies Student Society	dalcanadians@gmail.com
Dalhousie English Society	engsoc@dal.ca
Club Français – Student Society	francais@dal.ca
DalOUT	dalout@dal.ca
Dalhousie Agriculture Students' Association	robyn.mccallum@dal.ca
IDEAS Student Society	ideas@dal.ca
Dalhousie SOSA Society (Undergraduate)	ch839145@dal.ca
Dalhousie Arts and Social Sciences Society	dasss@dal.ca
Association of Health Administration Students (AHAS)	ahas@dal.ca
Biological/Environmental Engineering Society (BEES)	sarah.boyne@dal.ca
Community Health & Epidemiology Graduate Student Soc.	chestudentreps@gmail.com
Business Law Association of Dalhousie (BLAD)	Katelyn.Elling@dal.ca
DAL Action: A Community Stewardship Society	dalaction@gmail.com
Dalhousie Accounting Society (DAS)	dalhousie.acct.soc@gmail.com
Dalhousie African Student Association (DASA)	lokende@dal.ca
Dalhousie Alltrials Society (Daltrials)	dal.alltrials@gmail.com
Dalhousie Beekeeping Society (Dal Beekeeping)	george.t.kitching@dal.ca
Dalhousie Cancer Awareness and Research Society	contact@dcars.ca
Dalhousie Circle K International Society (Dal Circle K)	korede.akindoju@dal.ca
Dalhousie Collaborative Education Society (DCES)	cr686631@dal.ca
Dalhousie Commerce Society	office@dalcomm.ca
Dalhousie Computer Science Society (CSS)	society@dal.ca
Dalhousie Dental Students' Society (DDSS)	charlottedickie@dal.ca
Dalhousie Cooking Society (DCS)	dalcookingsociety@gmail.com
Dalhousie Diabetes Society (DDS)	al841443@dal.ca
Dalhousie Freethought Community (DFC)	herman.stubeda@dal.ca
Dalhousie Global Brigades (DGB)	allison.barry@globalbrigades.org
Dalhousie Global Public Health Brigades (DGPHB)	DGPHB@gmail.com
Dalhousie Graduate Nursing Society (DGNS)	mg816903@dal.ca
Dalhousie Health Initiatives Society (DHIS)	Douglas.Iaboni@dal.ca
Dalhousie International Students' Association (DISA)	disa@dal.ca
Dalhousie Meal Exchange (DAL MX)	rn230967@dal.ca
Dalhousie Medical Students' Society (DMSS)	dmss@dal.ca
Dalhousie Muslim Student Association (Dal-MSA)	msaatdal@gmail.com

Dalhousie Nursing Research Interest Group (N-RIG)	dalhousienrig@gmail.com
Dalhousie Occupational Therapy Student Society	braydon.connell@dal.ca
Dalhousie Oxfam Society (DalOxfam)	dalkings.oxfam@gmail.com
Dalhousie Pharmacology Graduate Student Society	elizabeth.cairns@dal.ca
Dalhousie Physiotherapy Student's Society (DPTSS)	madeline.raymond@dal.ca
Dalhousie Pre-Medical Student Society (DAL Pre-Med)	jtkh13@gmail.com
Dalhousie Recreation Society (Dal Rec)	hs759112@dal.ca
Dalhousie Student Pharmacy Society (DSPS)	ch487944@dal.ca
Dalhousie United States Association (DUSA)	wl305287@dal.ca
Dalhousie World Vision Society (DWVS)	dalwvsociety@gmail.com
Dalhousie/King's Red Cross Club (DKRCC)	nessa.maclean@dal.ca
Dalhousie's Right To Play Society (DTRP)	righttoplay.dalhousie@gmail.com
Environmental Engineering Society (EnESS)	ch606652@dal.ca
Environmental Law Students Society (ELSS)	elss@dal.ca
Environmental Programs Student Society (EPSS)	EPSS@dal.ca
European Studies Society (ESS)	europeanstudiesjournal@gmail.com
Faculty of Medicine Graduate Students' Society	Er427958@dal.ca
Food Allergy and Sensitivity Awareness and Support	alexandraostephenson@gmail.com
Gender and Women's Studies Student Collective (GWSC)	dalgwss@gmail.com
Health and Human Performance Graduate Student Society	hahpgss@gmail.com
Student Association for Health and Human Performance	sahhper@dal.ca
Health and the Environment Society	jmmcswee@dal.ca
Health Law Students' Association (HLSA)	hlsa.dal.law@gmail.com
Law Students' Society (LSS)	contact@dallss.com
MEDLIFE at Dalhousie University (MEDLIFE)	kl330746@dal.ca
Nova Scotia Public Interest Research Group (NSPIRG)	info@nspirg.ca
Rainforest Action Dalhousie (RAD)	molly.oray@dal.ca
Repair Our World (ROW)	l.rabinovitch@dal.ca
Social Activist Law Student Association (SALSA)	salsa.dalhousie@gmail.com
Society of Dalhousie Music Students (SDMS)	sdms.exec@gmail.com
Society of Undergraduate Planners (SUP)	sup.dalhousie@gmail.com
The Loaded Ladle Halifax Food Coop (Loaded Ladle)	loadedladle@gmail.com
World Animal Protection Dalhousie (WAP Dal)	Wspadal@dal.ca
Your Environment, Sustainability and Society Student Society	dalhousie.ess@gmail.com

Facebook Group Pages

GROUP NAME	GROUP STATUS	# OF MEMBERS
Dalhousie MLIS 2014-15	Closed Group	79
Class of 2015	Open Group within Dal.	680
Commerce	Open Group within Dal.	650
Dal. Association of Psych. Students	Public Group	230
Dal. Association of Grad. Students	Closed Group	984
Dal. University Graduating Class of 2016	Public Group	860
Dal. Arts & Social Sciences Society	College & University	806

Bulletin Boards:

Studley Campus

Killam Library: North Entrance; South Entrance (pillar)
Dalplex
Arts Center
Weldon Law Building
Goldberg Computer Science Building
LeMarchant Place
Sir James Dunn Building
Mona Campbell Building
Henry Hicks Building
Life Sciences Centre
Marion McCain Arts and Social Sciences Building
Kenneth C. Rowe Management Building
Student Union Building

Sexton Campus

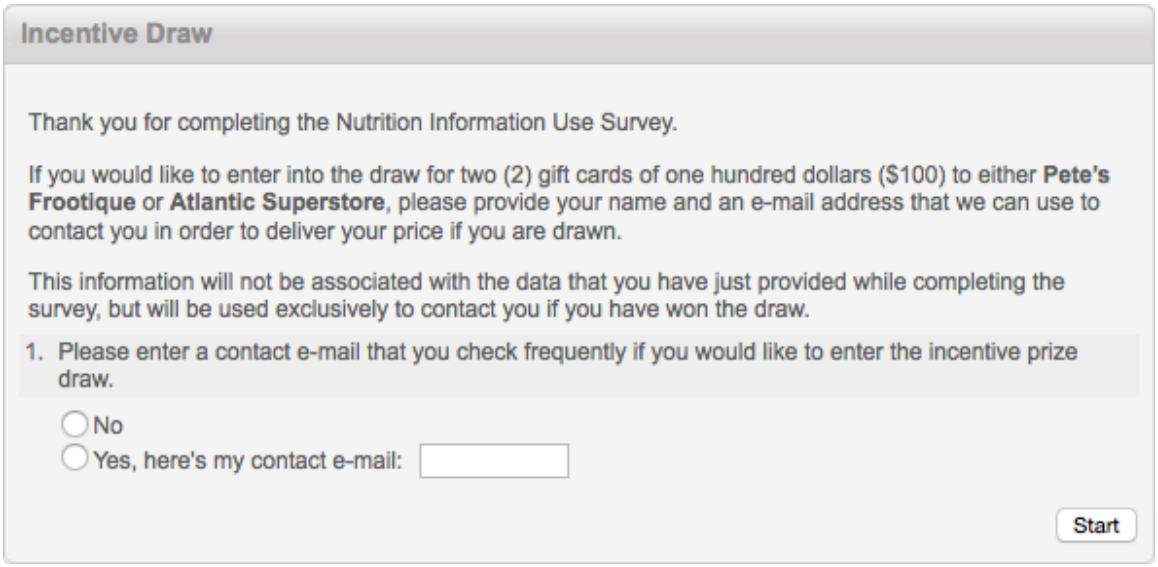
FH Sexton Memorial Gymnasium
Ralph M. Medjuck Building
Al MacDonald Building

Carleton Campus

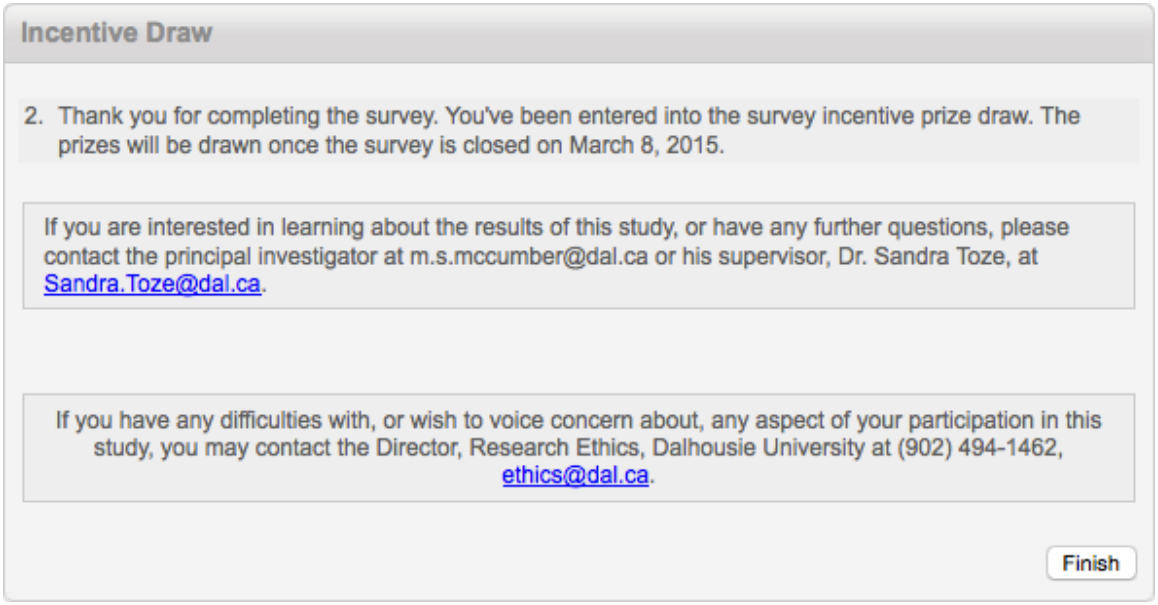
Dentistry Building
Sir Charles Tupper Medical Building
Life Sciences Research Institute

APPENDIX H – NIU SURVEY INCENTIVE PRIZE DRAW

The Incentive Prize Draw was delivered using Opinio software, accessible only via hyperlink provided at the end of the Nutrition Information Use Survey (see Appendix A). A total of two (2) participants who completed the NIU Survey were contacted and awarded each a $100 gift card to either Pete's Frootique or Atlantic Superstore. The draw took place on April 13, 2015.



[Complete – Thank you]



APPENDIX I – PHASE 2 CONFIRMATION OF INTEREST E-MAIL

DALHOUSIE UNIVERSITY
FACULTY OF MANAGEMENT

Dear participant,

Thank you for completing the Nutrition Information Use survey. Your time and insight have been very much appreciated. We are moving on to Phase 2 of our study and would like to confirm that you are still interested in participating. Those that complete Phase 2 will be offered an honourarium of $15 as an expression of gratitude for the volunteering of their time. This study will be conducted in a lab setting in the Rowe building on the Dalhousie Studley campus.

The session will be audio recorded to ensure that all discourse between participants and the researcher is accurately collected. The data collected during Phase 2 will be anonymized and kept confidential.

We would also like for you to bring your smartphone, fully charged (75% or more), and any other tool/device that you would have with you when grocery shopping to help you make your food purchase decisions.

We would like to schedule a time for you to complete Phase 2 that best suits your schedule. A reminder will be sent to you the day before you've scheduled to complete Phase 2 in order to remind you of your scheduled time and to remind you to bring your smartphone.

If you are still interested in participating, please confirm that you would like to complete Phase 2 of the Nutrition Information Use Study by responding to this e-mail and indicating a time that suits your schedule. The study will take one (1) hour to complete.

Thank you for your time and interest,

Mark McCumber
MLIS Candidate (2015)
Dalhousie University

If you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact the Director, Research Ethics, Dalhousie University at (902) 494-1462, ethics@dal.ca.

APPENDIX J – PHASE 2 REMINDER E-MAIL

DALHOUSIE UNIVERSITY
FACULTY OF MANAGEMENT

Dear Participant,

This is a friendly reminder concerning your participation in Phase 2 of the Nutrition Information Use Study. We ask that you please bring your charged smartphone (at least 75% charged) to complete the study. If you're a heavy smartphone user throughout the day, consider bringing along your charger.

You've scheduled later today, March 27, 2015, at 12:00PM to complete the Simulated Shopping Task. The lab is located in a study room on the 2nd floor of the Rowe Building, 3100 University Avenue on the Studley Campus. You will be meet in the main lobby of the building, inside the main set of doors (facing the SUB).

If you are unable to make this time, please respond to this e-mail, or text/call 902-719-8078, to schedule another time to complete the study. You may withdraw if you have decided that you are no longer interested in participating. If you have decided this, it would be appreciated if you would express this decision via response to this e-mail or via text to 902-719-8078.

Upon completing the study tomorrow, you will be awarded the honourarium of $15. The study should take less than 1 hour to complete.

Have a great day,
Mark McCumber

If you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact the Director, Research Ethics, Dalhousie University at (902) 494-1462, ethics@dal.ca.

APPENDIX K – INCENTIVE PRIZE WINNER E-MAIL

Dear incentive prize winner,

Thank you for completing Nutrition Information Use Survey. Your input is very much appreciated and we look forward to processing the results of the survey.
Please allow us to arrange the delivery of your prize of a $100 [Pete's or Atlantic Superstore – you decide] gift card! You can come pick your gift card up on the fourth floor of the Rowe building in Room 4020, 6100 University Avenue (Dalhousie's Studley campus).

If you are unable to pick up your gift card, arrangements will be made for it to be delivered to you. Please respond to this e-mail as soon as possible to get your prize!

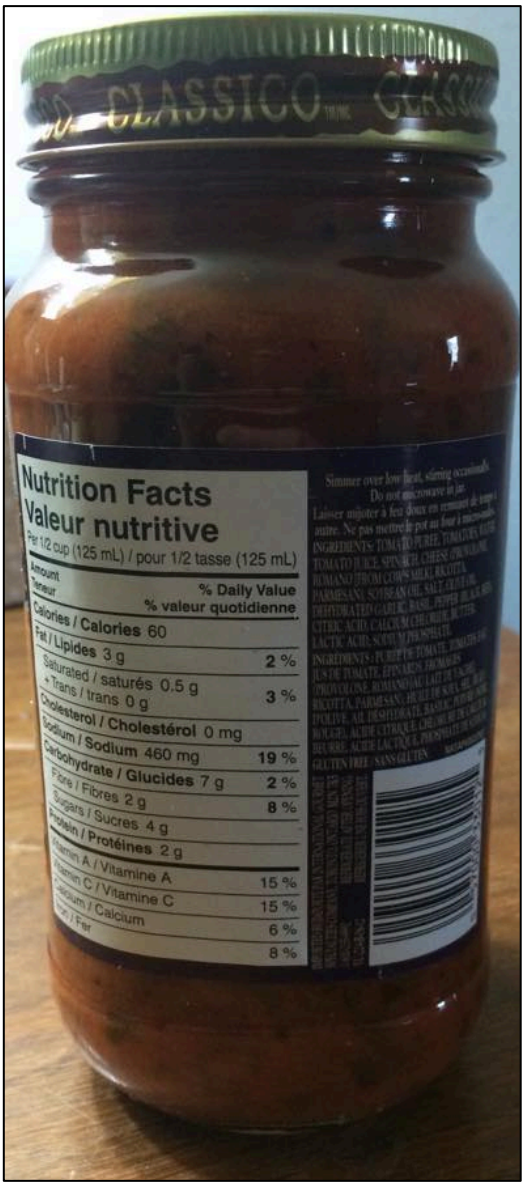
Thank you again for your participation,

Mark McCumber

APPENDIX L – FOOD PRODUCTS

Category 1: Bottled Spinach & Cheese Pasta Sauces

Classico – Florentine Spinach & Cheese – Pasta Sauce



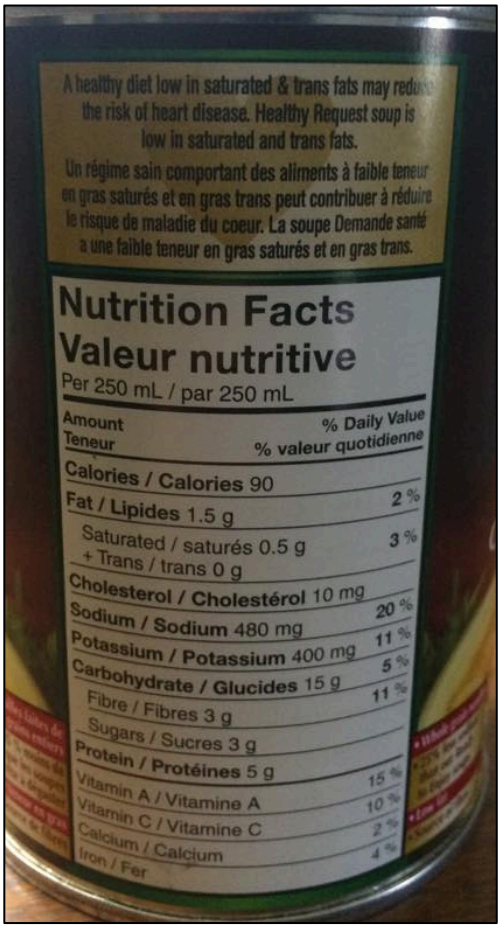
List of Ingredients:
Tomato puree, Tomatoes, Water, Tomato Juice, Spinach, Cheese (Provolone, Romano [from Cow's Milk], Ricotta, Parmesan), Soybean Oil, Salt, Olive Oil, Enzymes, Dehydrated Garlic, Basil, Pepper (Black, Red), Citric Acid, Calcium Chloride, Butter, Lactic Acid, Sodium Phosphate.
*Gluten free.

President's Choice – Spinach and Cheese – Pasta Sauce

List of Ingredients:
Tomatoes, Water, Spinach, Cheeses (Asiago, Parmesan, Romano) (Milk), Onions, Olive Oil, Salt, Garlic, Spices, Citric Acid.

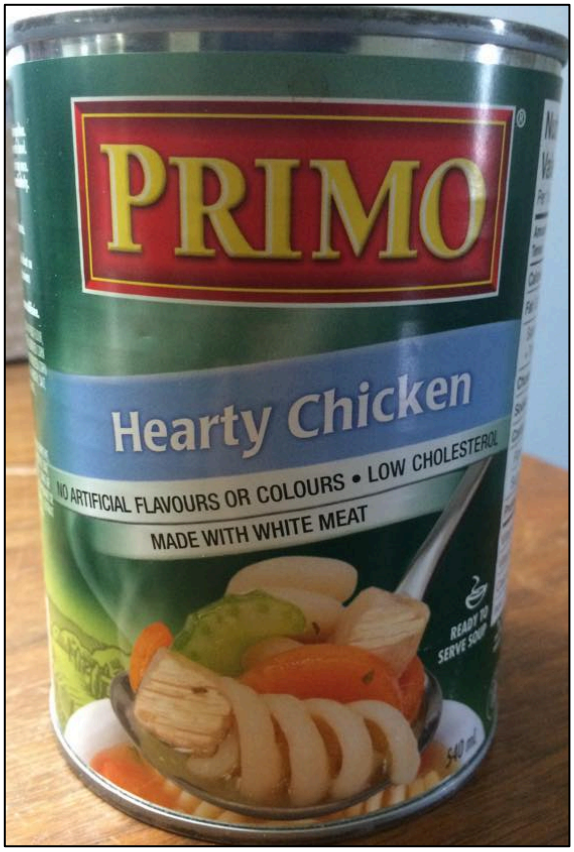
Category 2: Canned Chicken Noodle Soup

Campbell's Healthy Request – Herbed Chicken Noodle – Soup



List of Ingredients:
Chicken Broth (Water, Chicken Stock), Whole Grain Egg Noodle (Whole Grain Wheat Flour, Durum Semolina Flour, Egg Whites, Whole Egg), Celery, Seasoned Chicken, Carrots, Potato Starch, Chicken Flavour, Yeast Extract, Modified Corn Starch, Red Peppers, Salt, Onion Powder, Inulin (Chicory Root), Potassium Chloride, Chicken Fat, Dehydrated Garlic, Parsley, Sugar, Sea Salt, Flavour, Spice, Ascorbic/Citric Acid Blend, Beta Carotene and Soy Protein Isolate.

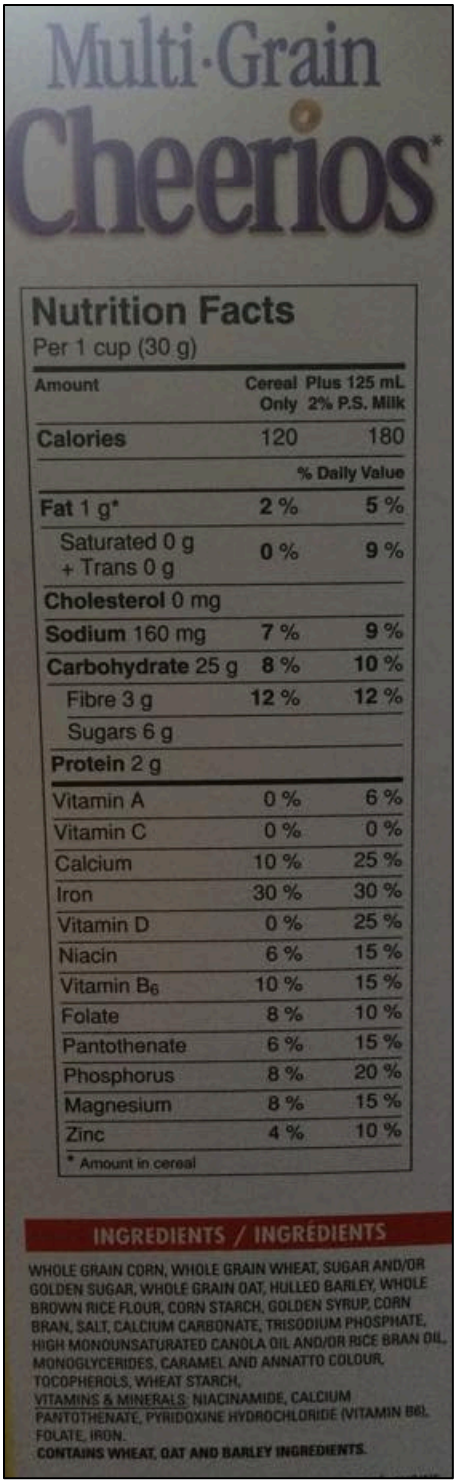
Primo – Herbed Chicken Noodle – Soup



List of Ingredients:
Water, Carrots, Rotini (Enriched Durum Wheat Flour, Egg Whites), Seasoned Chicken (White Chicken, Water, Modified Corn Starch, Salt, Sodium Phosphate), Celery, Chicken Fat, Hydrolyzed Corn Protein, Sea Salt, Potato Starch, Chicken Broth (Chicken Broth, Salt, Flavours), Yeast Extract, Onion Powder, Sugar, Seasoning, Dehydrated Parsley, Beta-Carotene.

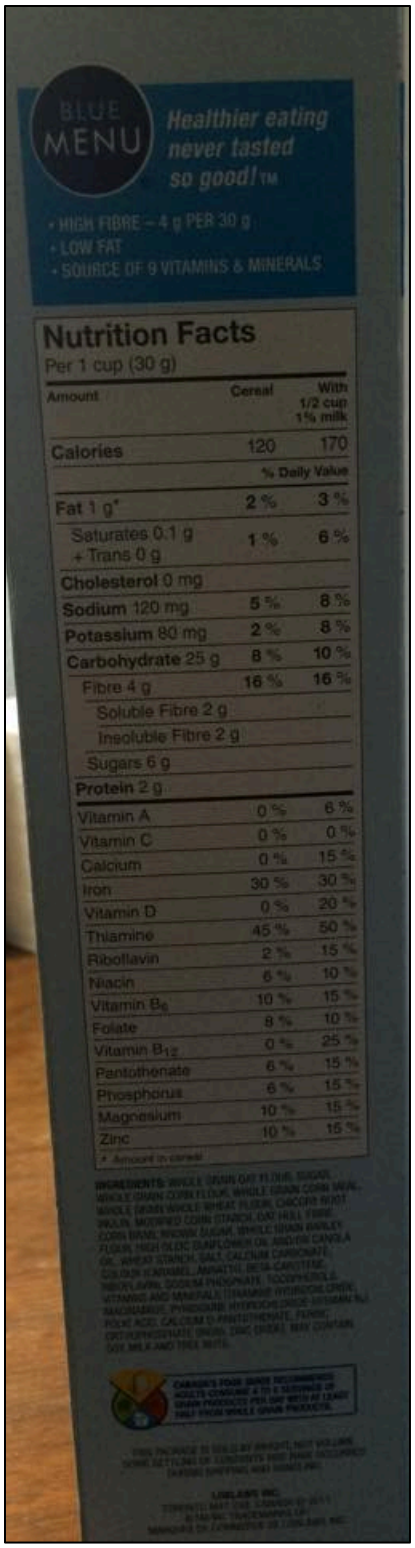
Category 3: Multigrain O's Cereal

Cheerios – Multi-Grain – Cereal



List of Ingredients:
Whole Grain Corn, Whole Grain Wheat, Sugar and/or Golden Sugar, Whole Grain Oat, Hulled Barley, Whole Brown Rice Flour, Corn Starch, Golden Syrup, Corn Bran, Salt, Calcium Carbonate, Trisodium Phosphate, High Monounsaturated Canola Oil and/or Rice Bran Oil, Monoglycerides, Caramel and Annatto Colour, Tocopherols, Wheat Starch.
Vitamins & Minerals: Niacinamide, Calcium Pantothenate, Pyrodoxine Hydrochloride (Vitamin B6), Folate, Iron.
Contains Wheat, Oat, and Barley Ingredients.

President's Choice – Multi-grain O's – Cereal



List of Ingredients:
Whole Grain Oat Flour, Sugar, Whole Grain Corn Flour, Whole Grain Corn Meal, Whole Grain Whole Wheat Flour, Chicory Root Inulin, Modified Corn Starch, Oat Hull Fiber, Corn Bran, Brown Sugar, Whole Grain Barley Flour, High Oleic Sunflower Oil and/or Canola Oil, Wheat Starch, Salt, Calcium Carbonate, Colour (Caramel, Annatto, Beta-Carotene, Riboflavin), Sodium Phosphate, Tocopherols, Vitamins and Minerals [Thiamine Hydrochloride, Niacinamide, Pyridoxine Hydrochloride (Vitamin B6), Folic Acid, Calcium D-Pantothenate, Ferric Orthophosphate (Iron), Zinc Oxide].
May Contain Soy, Milk, or Tree Nuts.

APPENDIX M – CONSENT FORM

DALHOUSIE UNIVERSITY
FACULTY OF MANAGEMENT

Simulated Shopping Task – Consent Form

Mark McCumber, (902) 719-8078 – m.s.mccumber@dal.ca
Dr. Sandra Toze, Faculty Supervisor, (902) 494-2488, stoze@dal.ca

Introduction
We invite you to voluntarily participate in this study on the use of nutrition information during food purchase decisions. This research is affiliated with Dalhousie University. It is part of a thesis project by the principal investigator, Mark McCumber, contributing toward his completion of the Master of Library & Information Studies program at Dalhousie University. Please note that we need participants who are willing to be observed and audio recorded while completing this task related to nutrition information use.

Purpose
The purpose of this research is to better understand how people use the nutrition information provided on food labels to make purchase decisions in the supermarket.

What you will be asked to do:
Participation in this phase of the study will take approximately 1 hour.

You will be presented with a series of pre-packaged food products and asked to complete a series of tasks related to these products. We would like you to imagine that you have come across these products in a supermarket setting, and that you are considering whether you might purchase these products.

You may use your smartphone—or any other resource you might use—at any time to help make these decisions. You will be encouraged to re-examine the food label of any of these products at any point during the study. The researcher may ask you to elaborate on your reasoning behind these decisions, and you may refuse to answer any question. These questions will be limited to nutrition information use, and are not expected to make you uncomfortable. To ensure the accurate recording of data, your discussion with the researcher will be audio recorded and transcribed to text at a later date. You will not be addressed by participant ID # during the session so as to preserve your confidentiality. We would appreciate that you answer all questions to the best of your ability and as honestly as your comfort allows.

Risks/Benefits
You may be uncomfortable speaking about some aspects of your nutrition information behaviour. Feel free to refuse to answer any question that makes you uncomfortable. You may also benefit from learning more about your nutrition information behaviour, and by increasing your awareness of the information you use to make food purchase decisions.

Compensation
You will be offered an honourarium of $15 as a demonstration of gratitude for the volunteering of time from their busy schedules to participate in this research project. This will be delivered to the participant upon completing this study and the signing of a receipt declaring that the honourarium was received.

Confidentiality & Anonymity
The data that you provide here will be kept confidential. After completing the study, before any data is processed, your contact e-mail will be destroyed so as to remove the possibility of any association between your identity and the collected data. You will be referred to by your participant # during the session so as to increase confidentiality. This consent form and the honourarium receipt signed at the end of the study will not be associable to the data that you have provided and will be stored in a secure location until the research project has been completed.

Data Retention
As stated, the e-mail address used to contact you will be destroyed after having completed this phase of the research and before any of the audio-recorded data is processed. The anonymized data will be retained until the final thesis project report has been finalized in early April. Once it has been successfully defended, all of the research data collected will be destroyed. The prospective date of data destruction will be May 30, 2015.

I, _____, have read the explanation of this study, provided above.

I have been given the opportunity to discuss it and my questions have been answered to my satisfaction.

I consent to being audio-recorded.

I consent to the use of quotations from my recorded session in a report or conference paper, using my participant ID # without reference to my personal identity.

I hereby consent to take part in this study. I understand that my participation is voluntary and that I am free to withdraw from the study at any time.

_____ _____
Participant's Signature Date Researcher's Signature Date

In the event that you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact Dr. Sandra Toze of the School of Information Management at Dalhousie University: stoze@dal.ca

If you have any difficulties with, or wish to voice concern about, any aspect of your participation in this study, you may contact the Director, Research Ethics, Dalhousie University at (902) 494-1462, ethics@dal.ca.

APPENDIX N – CODING HIERARCHY

Coding hierarchy and definitions, relying heavily on Furst et al. (1996) for conceptual framework and code categories. Level 1 of the hierarchy is emboldened; Level 2 is underlined; Level 3 and 4 are italicized; Level 5 is plain text. Code categories directly related to ingredient list information have also been emboldened for emphasis.

1. Context/Life course/Influences: All factors related to the individuals' context; all that has contributed toward the individuals' reality prior to encountering the decision-making circumstance.

1.1. Personal Factors: Nodes related to needs and preferences based on psychological or physiological traits, including demographic characteristics like age, gender, health status, & sensory preferences.

1.1.1. *Celiac disease*: Statements related to Celiac disease.

1.1.2. *Gluten-free*: Statements related to a gluten-free diet.

1.1.3. *Intolerances*: Statements related to the intolerance of food products.

1.1.4. *Paleolithic*: Statements related to a Paleolithic diet.

1.1.5. *Religious*: Dietary restrictions related to religious beliefs.

1.1.6. *Sickness*: Statements related to past sickness associated with foods.

1.1.7. *Veg*. vs. *Omni*: Statements related to the vegetarian/omnivore debate.

1.1.8. *Vegetarian*: Statements related to a vegetarian diet.

1.2. Ideals: Nodes related to expectations, standards, and beliefs affecting food purchase decisions.

1.2.1. *Environmental concerns*: Statements related to environmental concerns related to food production and consumption.

1.2.2. *Ethics*: Statements related to ethics or ethical concerns.

1.2.3. *Foodborne illness*: Statements related to foodborne illnesses.

1.2.4. *Free-range meat*: Statements related to free-range meat.

1.2.5. *Genetically modified*: Statements related to genetically modified foods.

1.2.6. *Hormones*: Statements related to growth hormones in foods.

1.2.7. *Pesticides & Herbicides*: Statements related to pesticides or herbicides in foods.

1.2.8. *Personal physical aesthetics*: Statements related to eating healthy to achieve an ideal body type.

1.2.9. *Supporting local*: Statements related to supporting local food production and business.

1.3. Social Framework: Nodes related to the influence of personal relationships and social roles on food purchase decisions.

1.3.1. *Childhood association*: Statements related to childhood memories of a food product effecting decisions.

1.3.2. *Familial influences*: Statements related to the nutrition behaviour of family members of the participant.

1.4. Resources: Nodes related to the physical resources available to the individual, such as money, equipment, and space, as well as intangible resources like skills, knowledge, and time.

1.4.1. *External information sources*: References to external sources of nutrition information used to gather nutrition knowledge.

1.4.2. *Information searching at home*: Statements related to nutrition info searching at home, or at least outside of the grocery store.

1.4.3. *Internet sources of nutrition information*: Statements related to the Internet sources used by participants.

1.4.4. *Nutrition information from social media*: Statements related to the impact of social media on access to nutrition information.

1.4.5. *Pre- or post-shopping information search*: Statements related to nutrition information searching either prior to or following a food shopping session.

1.4.6. *Reading about food*: Statements related to reading about food and nutrition.

1.5. Food context: Nodes related to the specific personal context that a food decisions is made within – closely related to Social Framework, as nutrition behaviour can vary depending why/where/when a food decision is being made; ie: Christmas treats.

1.5.1. *Store-dependent*: Nodes related to store-dependent factors specific to a particular shopping destination

1.5.1.1. *Proximity to store*: Statements related to the importance of one's proximity to a store.

1.5.1.2. *Shopping location*: Statements related to the impact of the shopping location on food purchase behaviour.

1.5.2. *Time restrictions*: Statements related to time restrictions affecting nutrition information behaviours.

2. Personal system: Personal systems develop over years of making food purchase decisions, consisting of a combination of *Value Negotiations* and *Strategies* unique to the individual.

2.1. Collecting points: Statements related to the collection of points to some end; such as an eventual discount at the supermarket or the redemption of points for a prize.

2.2. Ingredient List-dependent: Personal Systems dependent on ingredient list information to make food purchase decisions.

2.2.1. *Trigger-focused*: Personal Systems that utilize the ingredient list, as well as 'Contains' statements, with the primary objective of avoiding triggers. These participants scan the ingredient list looking for specific pre-determined ingredients that are either triggers or considered to be indicative of triggers (such as the possibility of powdered spices containing gluten).

2.2.2. *Ideal-focused*: Personal Systems that utilize the ingredient list to avoid ingredients that are perceived to be negative in accordance with the food-related ideals of the individual consumer.

2.3. Front-of-package appeal: Personal Systems that utilize front-of-package symbols / logos / graphics.

2.4. Reduced intake: Personal Systems involving the reduced intake of certain types of food, food types, or food components.

2.5. Low cost: Personal system of purchasing primarily based on comparative cost of products.

3. Value negotiations: All statements related to weighing and negotiating of any factor affecting a food purchase decision – valuations are situation-dependent and may vary between circumstances for the same individual.

3.1. Convenience: Statements related to the role of convenience in food purchase decisions.

3.2. Experience w/ product: Statements related to past experiences with the product.

3.3. External forces: Statements related to the influence of any external forces on food purchase behaviour, such as a points system or store flyer.

3.4. Food origin: Statements related to the origin of food products; where it was made or grown.

3.5. Healthiness: Statements related to perceptions of the healthiness of product / ingredient / nutrient.

3.5.1. *Front-of-package perceptions*: Statements related to participants' perceptions of healthiness from the front-of-package symbols or claims on a food label.

3.5.2. *Health risks*: Statements related to the perceived health risks associated with the consumption of a food.

3.6. Ingredient list: Nodes related to the evaluation of ingredient list information.

3.6.1. *Allergens:* Statements related to the presence or avoidance of allergens.

3.6.2. *Negative ingredients*: Statements related to negative ingredients.

3.6.2.1. *Chemical-sounding*: Statements related to the assumption that 'chemical-sounding' ingredients are negative in nature.

3.6.2.2. *Unhealthy ingredients*: Statements related to an ingredient being unhealthy and therefore negative.

3.6.2.3. *Salts*: Statements about salts in food; not limited to sodium, but any salt or salt substitute.

3.6.3. *Preference for certain ingredients*: Statements suggesting a preference for ingredients that are perceived to be positive.

3.6.3.1. *Common ingredients*: Statements about an ingredient being common or normal, and therefore positive – or at least not negative.

3.6.3.2. *Positive ingredients*: Statements indicating an ingredient is positive in nature.

3.6.3.3. *Known ingredients*: Statements indicating preference for known ingredients.

3.6.3.4. *Fewer additives*: Statements indicating a preference for foods that contain fewer additives.

3.6.4. *Primary ingredients*: Evaluating the primary ingredients listed in an ingredient list.

3.6.5. *Pronounceability of ingredients*: Evaluating ingredients based on pronounceability.

3.6.6. *Total number of ingredients*: Statements related to the total # of ingredients affecting food purchase decisions.

3.6.6.1. Physical length / size of ingredient list: Statements related to the physical size or length of an ingredient list.

3.6.7. *Trust in ingredient labelling*: Statements related to a lack of trust in ingredient labelling.

3.6.8. *Unknown ingredients*: Statements related to unknown ingredients on food labels.

3.6.9. *Vague ingredients*: Statements related to the apparent vagueness of a listed ingredient.

3.7. Labelling: Nodes related to evaluating the labelling of a food product.

3.7.1. *Front-of-package claims*: Statements related to the evaluating front-of-package claims.

3.7.2. *International labelling standards*: Statements related to the labelling practices of other countries.

3.7.3. *Misleading nutrition information*: Statements related to potentially misleading nutrition information on food labels.

3.7.4. *Straightforward labelling*: Statements related to the straightforwardness or clarity of a label / the information on a label.

3.7.5. *Trust in labelling*: Statements related to trust in food labelling practices or standards.

3.7.5.1. *Distrust of 'gluten free' claims*: Statements related to a lack of trust in products labeled 'gluten-free' to be entirely gluten-free.

3.7.6. *Unclear labelling*: Statements related to the label being hard to read / understand.

3.8. Limiting intake: Statements related to limiting or reducing intake of foods / components of foods.

3.9. Nature of Food: Nodes related to perceptions and evaluations of the nature of a food product or its components.

3.9.1. *Whole food*: Statements related to 'whole' foods.

3.9.2. *Additives*: Statements related to additives.

3.9.3. *Genetically modified*: Statements related to the genetic modification of food.

3.9.4. *Natural foods*: Statements related to a food being natural, or to its degree of naturalness.

3.9.5. *Organic*: Statements related to organic foods.

3.9.6. *Preservatives*: Statements related to food preservatives.

3.9.7. *Processed foods*: Statements related to processed foods.

3.9.8. *Unprocessed foods*: Statements related to unprocessed foods.

3.9.9. *'Real' food*: References to a preference for 'real' foods.

3.9.10. *Simple food*: References to a preference for simple foods.

3.9.11. *Understanding food content*: Statements related to understanding the content of food.

3.10. Nutrition Facts table: Nodes related to the evaluation of Nutrition Facts table information.

3.10.1. *Recommended daily intake*: Statements related to evaluating a product based on the listed percentages of daily intake per serving.

3.10.1.1. *Trust in recommended daily intake*: Statements related to trust in the listed percentages of daily intake per serving.

3.10.2. *Negative nutrients*: Statements about a nutrient being negative in nature.

3.10.2.1. *Calories*: Statements about the calorie content.

3.10.2.2. *Carbohydrates*: Statements about carbohydrates.

3.10.2.3. *Cholesterol*: Statements about cholesterol.

3.10.2.4. *Fat*: Negative statements about fat content.

3.10.2.4.1. Saturated fat: Statements related to saturated fats.

3.10.2.4.2. Trans fat: Statements related to trans fats.

3.10.2.5. *Potassium*: Statements about potassium.

3.10.2.6. *Sodium*: Statements about sodium.

3.10.2.7. *Sugar*: Statements about sugar.

3.10.3. *Positive nutrients*: Statements about a nutrient being positive in nature.

3.10.3.1. *Fat*: Positive statements about fat content.

3.10.3.1. *Fiber*: Statements about fiber.

3.10.3.1. *Protein*: Statements about protein.

3.10.3.1. *Vitamins*: Statements about vitamins.

3.10.4. *Serving size*: Statements about the listed serving size on the Nutrition Facts table.

3.11. Packaging: Nodes related to the evaluation of a food's packaging; type of package, size, etc.

3.10.1. *Size of packaging*: Statements related to the size of a food's packaging.

3.10.2. *Visual appeal of food through packaging*: Statements related to the visual appeal of food within the package, such as through a clear bottle.

3.10.3. *Visual appeal of graphics on food package*: Statements related to the visual / sensory appeal of the graphic images presented on food packaging.

3.12. Perceptions: Nodes related to perceptions of a particular food type / product / brand.

3.12.1. *Brand*: Statements related to a particular brand.

3.12.2. *Product marketing*: Statements related to the influence of a product / brand's marketing on their purchase decisions.

3.12.3. *Trust in food*: Statements related to trust in particular product / type of food.

3.12.4. *Trust in manufacturer*: Statements about trust in a food producer / manufacturer.

3.13. Price: Statements related to the role of price in food purchase decisions.

3.13.1. *High price equals high quality*: Statements related to the perception that a higher price implies a higher quality food.

3.14. Product similarity: Statements related to two products' similarity.

3.15. Quality: Nodes related to the perceived quality of a food product.

3.15.1. *Pay more for quality food products*: Statements related the willingness to pay more money for higher quality foods.

3.15.2. *Safe to eat*: Statements suggesting a food or ingredient being safe to eat.

3.16. Taste: Statements related to the role of taste in food purchase decisions.

4. Strategies: Statements related to *Strategies* (or heuristic short-cuts) that have been developed to help make purchase decisions, which tend to recur and become routine behaviours.

4.1. Avoidance: General *Strategies* of avoidance – not related specifically to ingredient list or Nutrition Facts table information (see 4.5. Ingredient list and 4.6. Nutrition Facts table).

4.1.1. *'Unhealthy' foods*: Strategy of avoiding unhealthy foods in general.

4.1.2. *Allergens*: Strategies employed to avoid allergens, apart from using ingredient list info.

4.1.2.1. *Buy less pre-packaged foods*: Strategy of buying less pre-packaged foods, so as to limit exposure to foods cross-contaminated with allergens.

4.1.2.2. *Using front-of-package symbol to identify allergen*: Using front-of-package symbols to identify products with allergens – ie: whole grain wheat symbol.

4.1.2.3. *Using front-of-package symbol to identify non-allergen products*: Using front-of-package symbols / logos to find products that do not contain allergens. ie: Celiac foundation logo.

4.1.2.4. *Habitual purchasing to avoid allergens*: Habitual purchasing of trusted food products to avoid allergens.

4.1.3. *Canned foods*: Strategy of avoiding the consumption of canned / bottled food products.

4.1.4. *Pre-packaged foods*: Strategy of avoiding pre-packaged food products in general.

4.2. Cook own food: Strategy of cooking one's own food instead of buying pre-made foods.

4.3. Exceptions: Statements related to exceptions and compromises to regular dietary behaviours for sensory pleasure, social factors, or any other reason.

4.4. Habitual purchasing: Statements related to habitual food purchasing, as a strategy to eat healthier and avoid unwanted foods / ingredients / nutrients.

4.5. Ingredient List: Strategies related to ingredient list use.

4.5.1. *Avoidance*: Strategies of avoidance using ingredient list information.

4.5.1.1. *Added sugar*: Statements related to products with added sugars.

4.5.1.1.1. Specific sugars: Strategy of avoiding certain types of sugars, like high fructose corn syrup.

4.5.1.1.2. Position of sugar in ingredient list: Strategy of choosing products that list sugar lower in the ingredient list.

4.5.1.2. *Allergens*: Strategies to avoid allergens using ingredient list information.

4.5.1.2.1. 'Contains' statement: Strategy of looking at the 'Contains' statements first to see if the manufacturer has highlighted an allergen in the food product.

4.5.1.2.2. Scan for allergens: Strategy of scanning the ingredient list for allergens; including as a secondary measure, after no 'Contains [allergen]' statement has been located.

4.5.1.3. *'Chemical' ingredients*: Strategy of avoiding 'chemical-sounding' ingredients.

4.5.1.4. *Pronounceability*: Strategy of avoiding ingredients that are perceived to be difficult to pronounce.

4.5.1.5. *Long-named ingredients*: Strategy of avoiding ingredients with long names.

4.5.1.6. *Short ingredient lists*: Strategy of choosing products with shorter ingredient lists

4.5.1.7. *Uncommon in cooking*: Strategy of avoiding ingredients that are perceived to be uncommon in cooking.

4.5.1.8. *Unknown ingredients*: Strategy of avoiding unknown ingredients so as to avoid potentially negative ingredients.

4.5.1.8.1. Prefer unknown ingredients lower in ingredient list: Strategy of choosing products with the unknown ingredients lower in the ingredient list so as to consume less 'unknown' ingredients.

4.5.1.9. *Unnatural ingredients*: Strategy of avoiding ingredients perceived as unnatural.

4.5.2. *Comparing ingredient list info with NF table info*: Comparing the ingredient list to the Nutrition Facts table to determine the source of nutrients within the ingredient list.

4.5.3. *Comparing two ingredient lists*: Strategy of comparing the ingredient lists to determine which product has fewer negative ingredients.

4.5.4. *Information seeking of unknown ingredients*: Strategy of in-store information seeking via smartphone Internet browser for information about an unknown ingredient.

4.5.4.1. *Only when 1 ingredient is unknown (or few)*: Supplementary information search, but only if a single (or few) unknown ingredients are listed – if several are unknown, energy may not be expended on seeking.

4.5.5. *Preference for fewer ingredients*: Strategy of preference for food with fewer ingredients.

4.5.7. *Scan primary ingredients*: Strategy of checking the primary ingredients (first several listed) to make sure a particular negative ingredient is not one of the primary ingredients.

4.5.8. *Preference for shorter ingredient lists*: Strategy of selecting foods with a shorter ingredient list.

4.6. Nutrition Facts table: Strategies related to the Nutrition Facts table.

4.6.1. *Comparing positive nutrients*: Strategy of comparing positive nutrients listed on the Nutrition Facts table of two comparable products.

4.6.2. *Comparing negative nutrients*: Strategy of comparing negative nutrients listed on the Nutrition Facts table of two comparable products.

4.6.3. *Fewer negative nutrients*: Strategy of choosing products with fewer negative nutrients.

4.6.4. *Negative over positive nutrients*: Considering negative nutrients more than positives.

4.6.5. *Positive over negative nutrients*: Considering positive nutrients more than negatives.

4.6.6. *Recalculate serving size*: Recalculating serving size to reflect a more realistic serving size that will likely be consumed.

5. Decisions: The decisions made, dependent on the task.

5.1. General: Statements about any purchase decision in general; either part of Phase 2 or brought up independently by the participant.

5.2. Select healthier product: Statements related to Task 2: selecting the healthier option within each product type category.

5.3. Select 1 per food type: Statements related to Task 1: select one product within each product type.

APPENDIX O – PARTICIPANT IDS

Participant A — Participant #2627295
Participant B — Participant #2629008
Participant C — Participant #2627021
Participant D — Participant #2634810
Participant E — Participant #2628286
Participant F — Participant #2628512
Participant G — Participant #2630246
Participant H — Participant #2631573
Participant I — Participant #2629835
Participant J — Participant #2629717
Participant K — Participant #2634771