2016

Impact of Product Label Communication Congruency on Attitude Certainty and Purchase Intention for Food Allergy Stakeholders Under High and Low Levels of Elaboration

Roger W. Wortman
Nova Southeastern University, roger.w.wortman@gmail.com

IMPACT OF PRODUCT LABEL COMMUNICATION CONGRUENCY ON ATTITUDE CERTAINTY AND PURCHASE INTENTION FOR FOOD ALLERGY STAKEHOLDERS UNDER HIGH AND LOW LEVELS OF ELABORATION

By
Roger W. Wortman Jr.

A DISSERTATION

Submitted to
H. Wayne Huizenga College of Business and Entrepreneurship
Nova Southeastern University

in partial fulfillment of the requirements
for the degree of

DOCTOR OF BUSINESS ADMINISTRATION

2016

A Dissertation

entitled

IMPACT OF PRODUCT LABEL COMMUNICATION CONGRUENCY ON ATTITUDE CERTAINTY AND PURCHASE INTENTION FOR FOOD ALLERGY STAKEHOLDERS UNDER HIGH AND LOW LEVELS OF ELABORATION

By

Roger W. Wortman Jr.

We hereby certify that this Dissertation submitted by Roger W. Wortman Jr. conforms to acceptable standards, and as such is fully adequate in scope and quality. It is therefore approved as the fulfillment of the Dissertation requirements for the degree of Doctor of Business Administration.

Approved:

Sara Weisfeld-Spolter, Ph.D. — Date 3/15/17
Chairperson

Cynthia Ruppel, Ph.D. — Date 3/13/17
Committee Member

John Stanton, Ph.D. — Date 2/25/17
Committee Member

Sara Weisfeld-Spolter, Ph.D. — Date 3/15/17
Chair, Doctoral Program

J. Preston Jones, D.B.A. — Date 3/22/17
Dean

H. Wayne Huizenga College of Business and Entrepreneurship
Nova Southeastern University
2016

CERTIFICATION STATEMENT

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed _____

Roger W. Wortman Jr.

ABSTRACT

IMPACT OF PRODUCT LABEL COMMUNICATION CONGRUENCY ON ATTITUDE CERTAINTY AND PURCHASE INTENTION FOR FOOD ALLERGY STAKEHOLDERS UNDER HIGH AND LOW LEVELS OF ELABORATION

by

Roger W. Wortman Jr.

Food allergies within the United States and Europe have become exceedingly prevalent in children, adolescents, and adults. In the United States alone, over 12 million people have been diagnosed with at least one food allergy. If the allergen is accidentally consumed, the food allergy sufferer may suffer a life-threatening condition known as anaphylaxis. More than 200 U.S. food allergic consumers die annually as a result of anaphylaxis due to ingestion of food allergens. To safely manage food allergies, food allergy sufferers and stakeholders (such as caregivers) require clear and complete ingredient information to avoid certain allergens in packaged food products. Despite U.S. legislative mandates designed to assist the food allergic consumers and stakeholders to make safe food selection choices, food allergy labeling on consumer packaged food products remains unclear. To properly manage food allergy, it is imperative that food allergy stakeholders have access to clear and unambiguous food allergen ingredients located on the food product labels. The purpose of this research was to capture the impact of current United States food allergen labeling guidelines on U.S. food allergy stakeholders. With the elaboration likelihood framework, this research aimed to better understand how the congruence of allergen ingredient information on the Product Label Claim on the front of the package and Nutrition Facts Panel information on the back of the package affected food allergic consumers and stakeholders in evaluation of product packaging allergen information. A total of 223 food allergy stakeholders were administered four surveys depicting food allergen labeling variations found on U.S. food product labels. Seventeen hypotheses were formulated and analyzed with ANCOVA and *t* tests to measure the impact of congruence and elaboration of the food allergen messages on the food product labels, with a specific focus on purchase intention. Findings indicated that food allergy stakeholders had difficulties using and understanding existing food allergen labels under current U.S. food allergen labeling guidelines. The results also showed confusion among U.S. food allergic stakeholders with safe food selection choices when the label claims did not align with the actual allergen ingredient information. Research, public policy, and managerial implications were thoroughly discussed.

ACKNOWLEDGMENTS

I would like to thank my family, friends, and those who have provided support and guidance throughout the dissertation process. Thank You!!

TABLE OF CONTENTS

APPENDIX

LIST OF TABLES

Table

Page

FIGURE

Figure

Page

INTRODUCTION TO RESEARCH

Suppose a consumer who is allergic to dairy products is shopping for a non-dairy yogurt. After browsing through a variety of brands, she sees the product “O'Soy," with a Product Label Claim identifying the product as “organic soy yogurt.” Is it safe for the food allergic consumer to rely on this information, purchase, and then consume this product?

This is a serious question faced by many food allergic consumers today, and the answer is not as simple as one would presume. The “O’Soy” brand name appears to indicate this is a soy- based yogurt. In addition to the brand name itself, a prominent Product Label Claim in large bold font on the front label identifies the product as "Organic Soy Yogurt." A recent research study has suggested that food consumers are influenced by and base their purchase decisions on the name of the food product (Irmak, Vallen, & Rosen Robinson, 2011). Additionally, prior research has substantiated the notion that food allergic consumers utilize package information and product claims to evaluate if a product contains an allergenic substance (Voordouw et al., 2012).

If the above food allergic consumer assesses allergen risk in a similar fashion, this is but one example of how a food allergic consumer may unknowingly consume an allergenic substance, since an inspection of the back label of the “O’Soy” yogurt states that the product "contains milk" (Appendix A, Figure A1). This potential mistake, relying on the package information found on the front of the yogurt container's label, could be

life-threatening to a food allergic consumer allergic to dairy products. Further investigation revealed an online disclosure, found on the "O'Soy" website, that states, "O’Soy is lactose free and that those who are *only lactose intolerant*, and not *allergic* to milk, can safely enjoy O’Soy" (Stonyfield Farms, 2011). In 2014, Stonyfield Farms modified the ingredients and cultures used in O'Soy yogurt to eliminate dairy in the yogurt (Stonyfield Farms, 2014).

CHAPTER I

INTRODUCTION

Problem and Subproblem

Problem

As the previous example illustrates, more understanding and research are needed, since confusing and often conflicting product ingredient information appears on food product labeling. Food product labels need to effectively and efficiently communicate ingredient information to vested stakeholders, such as food allergy sufferers, but how to best do this remains uncertain (Cornelisse-Vermaat, Voordouw, Yiakoumaki, Theodoridis, & Frewer, 2008). Domestically and internationally, food allergies have become exceedingly prevalent in children, adolescents, and adults (America, 2011; American Academy of Allergy Asthma & Immunology [AAAI], 2011a, 2011b; Buhl, Kampmann, Martinez, & Fuchs, 2008).

Both the United States and various European governments recognize the importance of clear and complete ingredient communications of known allergens to allergic consumers (Agency, 2014; United States Departmenat of Health and Human Services [USDHHS], 2006). To improve methods of allergen disclosure in packaged foods, numerous governments have instituted various labeling and allergen disclosure

laws. These include the United States' Food Allergen Labeling and Consumer Protection Act (FALCPA) and legislation improvements such as those found in the European Union's Food Information for Consumers Regulation (Agency, 2014; USDHHS, 2006).

Regardless of legislative mandates, manufacturers should institute clear labeling if the product(s) place consumers at risk for harm (Crevel, 2001). "Consumers expect, and the food industry must ensure, that its products will be safe for all consumers" (Crevel, 2001, p. 94). Yet, despite the ethical benefits and legislative mandates designed to assist the food allergic consumer, food allergy labeling remains unclear (Barnett, Leftwich, et al., 2011; Barnett, Muncer, et al., 2011; Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Marchisotto et al., 2016; Mills et al., 2004; Sakellariou, Sinaniotis, Damianidou, Papadopoulos, & Vassilopoulou, 2010).

Limited research in this area has suggested that food allergic consumers typically evaluate if a food product is safe to eat based on two sources of information (located on the product's label): the Product Label Claim(s) and information contained in the Nutrition Facts Panel (Barnett, Leftwich, et al., 2011; Barnett, Muncer, et al., 2011; Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Mills et al., 2004; Simons, Weiss, Furlong, & Sicherer, 2005; Taylor & Hefle, 2001; Verrill & Choinere, 2009; Voordouw et al., 2012). Despite the product label being the preferred source for allergen communications and the consensus that food allergen labeling needs improvements, there is no clear agreement on the best manner to convey allergen information to the food allergic stakeholder (Barnett, Leftwich, et al., 2011; Barnett, Muncer, et al., 2011; Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Crevel et al., 2008; Miles, Valovirta, & Frewer, 2006; Sakellariou et al., 2010; Taylor & Hefle, 2001; Voordouw et al., 2012). Further, as

noted in the opening example, conflicting (incongruent) allergen information has been communicated to the allergic consumer via the product information and packaging material. How these incongruencies affect allergic consumers' perceptions and attitudes remains unclear.

Subproblem

This study sought to contribute to the under-researched and newly emerging domain of food allergic consumers by conceptualizing a decision making process based on the degree of elaboration the consumer engages in when reading and evaluating information contained on the food product label and the Nutrition Facts Panel. The particular focus was on the effects of congruent and incongruent allergen information to help answer the questions stated above. From a theoretical standpoint, this paper integrated the Elaboration Likelihood Model (ELM) to better understand purchase intentions of allergic consumers when faced with congruent and incongruent allergen information found on the product label, The study also examined the effects of congruence on attitude certainty of product safety, overall attitude certainty, perception of milk/dairy, perceived credibility in claim, trust in nutrition information, trust in brand and label, and purchase intention. From a managerial and social policy perspective, this paper sought to highlight current labeling issues faced by allergic consumers and to contribute towards the development of clear and unambiguous allergen disclosures on consumer packaged food products.

Ultimately, the overarching goal of this paper is to help provide a safer and more consumer friendly food shopping experience for allergic consumers through an alignment

or congruency of the food allergen communication message. This message consists of allergen information communicated by way of the Product Label Claim located on the front of the food package label and the Nutrition Facts Panel information located on the back or side of the food package label. Specificity is needed to provide clear, concise, and accurate allergen information to food allergic consumers and stakeholders of food allergic individuals.

For purposes of this research, food allergic consumers, unless specifically identified as such, was included under the collective term "food allergic stakeholder." This term is used to identify food allergic consumers and stakeholders of food allergic consumers to include parents, loved ones, and caretakers responsible for food selection for the food allergic consumer.

Research Questions

1. How does elaboration and congruency of product package allergen information affect attitude certainty of product safety?
2. Does trust in brand and label mediate between congruency of product package allergen information and purchase intention?
3. How does elaboration and congruency of product package allergen information affect overall attitude certainty?
4. Does overall attitude certainty mediate between congruency of product package allergen information and purchase intention?
5. How does elaboration and congruency of product package allergen information affect perception of milk/dairy?

6. Does perception of milk/dairy mediate between congruency of product package allergen information and purchase intention?
7. How does elaboration and congruency of product package allergen information affect perceived credibility in claim?
8. Does perceived credibility in claim mediate between congruency of product package allergen information and purchase intention?
9. How does elaboration and congruency of product package allergen information affect trust in nutrition information?
10. Does trust in nutrition information mediate between congruency of product package allergen information and purchase intention?
11. How does elaboration and congruency of product package allergen information affect trust in brand and label?
12. Does trust in brand and label mediate between congruency of product package allergen information and purchase intention?
13. How does elaboration and congruency of product package allergen information affect purchase intention?
14. Is there a difference between initial purchase intention based on allergen information contained on the front of the product label and purchase intention based on the congruency and elaboration of allergen information found on the front and rear of the product package?
15. How does access to congruent (incongruent) product package allergen information affect attitude certainty to product safety and overall attitude certainty as compared to just seeing the product label alone?

Background and Justification

Research pertaining to food allergic consumers is in its infancy in both Europe and the United States, as evidenced by foundational research and public policy changes that have taken place within the last decade**.** Previous research has highlighted multiple issues food allergic consumers encounter with food product claims and Nutrition Facts Panel information. In an exploratory research study conducted in the Netherlands and Greece, Cornelisse-Vermaat et al. (2008) found (a) food allergic consumers had perceived problems with readability of product label, (b) product ingredients lists were found to be insufficient in identifying food allergens contained in the food product, (c) consumers were not satisfied with current labeling guidelines of food allergen identification, and (d) food allergic consumers relied on product claims and Nutrition Fact label information to manage their allergies. Based on their findings, the researchers concluded that further research is needed to understand the best manner to convey food allergen information on product labels (Cornelisse-Vermaat et al., 2008).

In a recent study conducted within Germany and the Netherlands, Voordouw et al. (2012) investigated food allergic consumer preferences for information delivery of allergenic ingredients. Study participants examined three methods of information delivery that were previously identified within the authors' prior research study. The three prototype delivery methods were presented in three distinct mediums: (a) product label, (b) a handheld electronic scanner utilized during the shopping experience, and (c) an information booklet that was carried with the shopper (Voordouw et al., 2012). The findings indicated that food allergic consumers trusted and preferred food product ingredient information communicated via the product label, followed by the electronic scanner and the information booklet, respectively (Voordouw et al., 2012).

A U.S.-based research study found food product label information to be the single strongest tool in the identification of food allergens among allergic consumers and caretakers of allergic consumers (Simons et al., 2005). Most allergic consumers "relied on food package labeling and further information from manufacturers to determine if a food was safe to eat" (Simons et al., 2005, p. 427). Results from the study also indicated that 99% of allergic consumers and their caretakers read product labels during the shopping experience and 94% reread the same labels during cooking and food preparation to prevent the accidental introduction of allergenic food ingredients (Simons et al., 2005).

Similarly, in a separate study conducted in the United Kingdom with nut-allergic consumers, Barnett, Leftwich, Muncer, et al. (2011) identified a variety of methods that nut-allergic consumers utilize to determine if a food product contains a particular allergen. The researchers found "participants sometimes used the product brand or name as a source for their risk assessment" and reflected "on prior experience with the product" (Barnett, Leftwich, Muncer, et al., 2011, p. 972). Further, when the above allergen identification strategy did not assist with providing a confident determination of allergens contained in the food product, "participants used other printed packet information such as the ingredients list" and allergy advice boxes (Barnett, Leftwich, Muncer, et al., 2011, p. 972). The allergic consumers interpreted a product to be allergen-free if the label lacked a "contains" statement (Barnett, Leftwich, Muncer, et al., 2011). If United States food allergic consumers and food allergy stakeholders process information similarly to their United Kingdom counterparts, the results could be life-threatening since, according to

FDA guidelines, a "contains" statement is optional (Agency, 2014; United States Departmenat of Health and Human Services [USDHHS], 2009a).

Participants in the study by Barnett, Leftwich, Muncer, et al. (2011) concluded that statements such as "nut-free" and/or "milk-free" located on the product packaging and a standardized approach to allergen labeling would prove invaluable. If U.S. food allergy stakeholders perceive similar Product Label Claims such as "dairy-free" in a related manner, the results could be life-threatening. Dairy protein derivations such as sodium caseinate are, in accordance with FDA and FALCPA guidelines, permitted in food products even when product labels make claims such as "dairy-free" (United States Departmenat of Health and Human Services [USDHHS], 2009b). Figure 2A (Appendix A) illustrates an example of a food product that is clearly labeled as "dairy-free" but contains dairy protein and/or dairy protein derivatives; the trigger for allergic reactions in dairy allergic consumers.

In addition to "contains" statements, recent research has investigated precautionary allergen labeling(Marchisotto et al., 2016). Although allergen disclosures are frequently governmental mandated, precautionary allergen labeling is voluntary (Marchisotto et al., 2016). Similar to the lack of cohesive allergen disclosures from 10 or more years ago, precautionary allergen labeling is another area that has created confusion among allergic consumers (Marchisotto et al., 2016). Since these precautionary allergen labeling disclosures are often imprecise or laden with generalized, nonspecific "cautions," precautionary allergen labels easily create confusion for the consumer.

A separate United States study investigated the impact of a product's name and its effect on food evaluation and consumption (Irmak et al., 2011). The findings indicated

that dieters rely on and make purchase decisions based on the name of a food product (Irmak et al., 2011). If food allergy stakeholders utilize the product name in a similar fashion, the food allergic consumer may unknowingly consume an allergenic substance, and potentially suffer from a life-threatening allergic reaction.

The current research aims to further expand these findings as well as answer the call for conducting of future research to better understand the best manner to convey food allergen information to food allergy stakeholders (Barnett, Leftwich, et al., 2011; Barnett, Muncer, et al., 2011; Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Crevel et al., 2008; Marchisotto et al., 2016; Miles et al., 2006; Sakellariou et al., 2010; Taylor & Hefle, 2001; Voordouw et al., 2012). Therefore, by an examination of purchase intentions of U.S. food allergy stakeholders when faced with congruent and incongruent allergen information found on the product label; and the effects of congruence on attitude certainty, perception of ingredients, perceived credibility in claim, trust in claim and trust in brand, this research aims to provide insight into how food allergy stakeholders evaluate product packaging information. Insight will likely help marketers understand the best way to communicate to these consumers in a truthful, efficient, and effective manner.

Background on Food Regulation: The Food and Drug Administration

The Food and Drug Administration (FDA) is a United States governmental agency that, among other tasks, is directly responsible for the inspection and regulation of food and food products sold within the United States, U.S. territories and U.S. possessions (United States Department of Health and Human [USDHHS], 2010). Specifically, the FDA is charged with the responsibility of monitoring and regulating foods and food packaging to ensure each product meets minimum standards for "safe,

wholesome, sanitary, and properly labeled" foods (USDHHS, 2010, para. 1). In 2004, the Food Allergen Labeling and Consumer Protection Act was enacted to directly address the labeling of food products and the identification of allergens contained in food products (USDDHS, 2006; Verrill & Choinere, 2009). Prior to the institution of FALCPA, manufacturers were not required to provide food product ingredient lists that clearly disclosed all ingredient contents of a food product.

Beginning in 2006, FALCPA required food manufacturers to institute mandatory product label changes (USDHHS, 2006). The Act identified major food allergens from three food groups—milk, eggs, and fish—and five particular foods—crustacean shellfish, tree nuts, wheat, peanuts, and soybeans (USDHHS, 2006). As of this writing, allergenic ingredients that are not part of FALCPA's listed food groups or food items are not required to be identified on the product label (HSDHHS, 2006). This exception does not mean, however, that additional allergens not noted by the FDA do not pose a risk for certain food allergic consumers.

Under FALCPA, manufacturers must identify FALCPA-recognized allergens on the food product label. Identification of the allergenic ingredient may be accomplished in one of two ways: (a) by identification of the allergen in the ingredients section of the Nutrition Facts Panel, or (b) by the inclusion of a "contains" statement on the Nutrition Facts Panel (USDHHS, 2006). Manufacturers need only meet these minimum requirements to satisfy FALCPA guidelines. An example of the FDA mandated label requirements, per FALCPA guidelines, may be found in Figure A3 (Appendix A).

Despite the advances that resulted from FALCPA, food allergy stakeholders still face countless challenges during the food shopping experience. These challenges include

product names that are misleading, Product Label Claims that are deceptive and/or confusing, and inconsistent disclosure of allergens on the Nutrition Facts Panel. Under the recently enacted FALCPA guidelines, the FDA briefly but insufficiently details significant shortcomings with food allergen labeling (USDHHS, 2009b).

One such example pertains to food products that contain dairy and/or dairy derivatives. As of this writing, the FDA chose to not define or regulate Product Label Claims such as "non-dairy" or "dairy-free" (USDHHS, 2009b; Figure A2, Appendix A). Instead, according to FDA guidelines, the manufacturer must identify dairy within either (a) the nutrient ingredient list, or (b) via a "contains" statement located within the nutrient fact panel. If a dairy allergic consumer were to rely on a Product Label Claim and consume a product purported as "non-dairy" when in fact it contained dairy, the food allergic consumer would unknowingly ingest the dairy allergen and suffer an allergic reaction. This specific problem, a conflict between Product Label Claim and actual ingredient information and disclosure, is what the current research addressed.

Background: U.S. Food Allergies

An important distinction must be made between food intolerance and food allergy. The two terms should not be confused (American Academy of Allergy Asthma & Immunology [AAAI], 2011c; USDHHS, 2009b). Food intolerance is commonly referred to as digestive discomfort (American Academy of Allergy, 2011c; USDHHS, 2009b). Signs of food intolerance include but are not limited to symptoms such as gas, bloating, and nausea. Food intolerant consumers, such as consumers who have problems digesting lactose, can purchase lactose-reduced milk or lactose digestive aids to assist in milk digestion (USDHHS, 2009b).

Unlike food intolerance, food allergy is an incurable disease (AAAI, 2011a). When a person with a food allergy ingests the allergenic ingredient, an allergic reaction is likely to ensue (AAAI, 2011a; American Academy of Allergy Asthma & Immunology [AAAI], 2011d). As detailed earlier, an allergic reaction is the immune system's abnormal response towards a particular allergen or allergens (AAAI, 2011a). Food-based allergic reactions are life-threatening and are responsible for more than 200 U.S. deaths annually (America, 2011).

Researchers and physicians estimate approximately 3% to 4% of the U.S. population has been diagnosed with at least one food allergy (AAAI, 2011b). Given current U.S population estimates, this percentage translates into 12 million food allergic consumers who have been diagnosed with food allergies. According to a study conducted in 2010, 8% of U.S children were identified as food allergic (AAAI, 2011b). The prevalence of undiagnosed food allergies in U.S. adults and children is believed to be much greater..

Background: The FDA and Dairy Ingredients

Allergies to dairy products affect many adults but are most prevalent in children under the age of 16 (AAAI, 2011b). Despite these dangers, minimal guidelines, policies, and/or mandatory requirements exist that govern terms such as "non-dairy," "dairy-free," or other derivations of a communication that state whether a product contains dairy or dairy derivatives (USDHHS, 2009b). The FDA requires only that manufacturers of food products provide "information that is truthful and not misleading" (USDHHS, 2009b, p. 1). This minimal requirement is problematic because manufacturers, via the use of brand names, product descriptors, and product claims, are permitted to use certain terms that, at

this writing, have no FDA agreement regarding their definition. Due to the ambiguity regarding an appropriate definition or use of claims such as "dairy-free," product labels may assert these claims even if the food product contains dairy or dairy derivatives, thus potentially harming consumers with food allergies.

Figure A2, Front of Package (Appendix A) illustrates an actual coffee creamer product that overtly claims the food product as "non-dairy" on the front of the package. If the consumer were to investigate the back of this coffee creamer label, As in Figure A2, Back of Package (Appendix A) and read the Nutrition Facts Panel, the consumer may not be able to discern if the suspect food contains dairy or dairy derivatives. The terms "milk" or "dairy" may be inconspicuously disclosed in fine print located within an ingredients list or in a "contains" statement (USDHHS, 2009a). This ambiguity poses a dire problem for food allergic consumers and food allergy stakeholders, especially if a dairy allergic individual were to consume the product based on a false Product Label Claim of "non-dairy" (Figure A2, Rear of Package). In this example, the product claim of "non-dairy" is deemed permissible by the FDA and under FALCPA guidelines because the product label contains a disclosure in the ingredient list and/or allergen disclosure via a "contains" statement.

Also permissible is the use of a misleading brand name that insinuates the lack of a particular allergen. An example is the soy yogurt product in Figure A1 (Appendix A). An initial inspection of the front of the label may falsely lead some consumers to believe the product is soy yogurt and therefore does not contain dairy. However, an FDA-compliant disclosure located within the Nutrition Facts Panel (located on the back of the

product label) discloses that the product contains dairy. As with the coffee creamer, the soy yogurt example potentially poses health issues for dairy allergic consumers.

Despite the institution of FALCPA's mandatory guidelines which were meant to address these issues, additional research and knowledge are needed. Confusing and often conflicting product ingredient information still remains on food product labeling. As established in prior research, it is clear that food product labels need to effectively and efficiently communicate ingredient information to vested stakeholders such as food allergy sufferers, but how to best disseminate this information remains uncertain (Cornelisse-Vermaat et al., 2008).

The need for clear, concise and accurate allergen ingredient information is consistent with previous research conducted in the United Kingdom that indicated nut allergic consumers utilized and interpreted labeling such as "nut-free" to assess if a product contained tree nuts (Barnett, Lefwich et al., 2011). In the United States, statements such as "dairy-free" are misleading and blatantly dangerous because the food product, in accordance with FDA and FALCPA guidelines, is allowed to contain dairy and dairy derivatives. If U.S. food allergy sufferers interpret product labeling similar to nut-allergic U.K. food allergy sufferers, manufacturers (including brand names), policy makers, and various allergy stakeholders such as allergy afflicted consumers need to take action.

If U.S. food allergic consumers or stakeholders for food allergic consumers were to rely solely on these misleading and false overt Product Label Claims and/or product descriptors, the side effects could be disastrous. The lives of food allergic consumers would be at risk. Therefore, this research was based on the conviction that an alignment

or congruency of the food allergen communication message, consisting of Product Label Claims and Nutrition Facts Panel information, and including brand name(s) and product descriptor(s), is needed to convey clear, concise, and accurate allergen information to food allergic consumers and stakeholders of food allergic individuals.

Definition of Terms

To alleviate confusion regarding various medical, business, and other terms used throughout this study, a number of important terms are expressly defined. For purposes of this study, no assertion or assumption is made of any definition or interpretation of a term that falls outside the clearly defined scope detailed below. For example, the term *food allergy* is commonly misused and confused with the term *food intolerance*. A working knowledge of the terms below enhances comprehension of a number of important themes and findings within this study.

Food allergy: This term relates to an incurable and chronic disease that affects individuals irrespective of race, age, or gender (AAAI, 2011a; Mills et al., 2007).

Food allergy stakeholder: This term refers to all parties, including the actual allergic consumer and vested stakeholders, such as guardians who have authority over the food selection for a food allergic person.

Allergic reaction: This term refers to the body's abnormal immune system response towards a particular allergen or allergens (AAAI, 2011a; USDHHS, 2009b). Allergic reactions are potentially life-threatening and present symptoms such as asthma, difficulty swallowing, and in extreme cases anaphylaxis (AAAI, 2011a; American Academy of Allergy Asthma & Immonology [AAAI], 2011e).

Allergen: This term denotes any substance, whether naturally occurring or manmade, that triggers an allergic reaction (AAAI, 2011a).

Anaphylaxis: This is a life-threatening allergic reaction that requires immediate advanced medical treatment (AAAI, 2011e).

Food intolerance: Not to be confused with *food allergy*, this term commonly refers to digestive discomfort, in which individuals exhibit symptoms such as gas, bloating, and nausea (AAAI, 2011c; USDHHS, 2009b).

Product Label Claim: These are claims made by manufacturers directly, or through a manufacturer's brand name, that are included on the product packaging (Garretson & Burton, 2000). For purposes of this study, the term includes any claim the manufacturer, through the brand name, asserts or avails on the front of the food product package.

Nutrition Facts Panel: The Nutrition Facts Panel includes dietary information such as the table of recommended values consumers use to asses individual meal choices (Garretson & Burton, 2000). For purposes of this study, the Nutrition Facts Panel includes the Nutrition Facts data, ingredient list, and any FDA-mandated allergen statements commonly found on the rear of the food product packaging.

Congruency (congruent): This is a multipart communication message with matching information (Sansgiry & Cady, 1997). For purposes of this study, the term refers to alignment between Product Label Claim and the corresponding Nutrition Facts Panel information (Garretson & Burton, 2000).

Incongruency (Incongruent): This is a multipart communication message with information elements that do not match (Sansgiry & Cady, 1997). For purposes of this

study, the term refers to the misalignment, or lack of consistency, between Product Label Claim and the corresponding Nutrition Facts Panel information (Garretson & Burton, 2000).

Consumer perception of ingredient claim (Perception):"Perception is the process of selection, organization and interpretation of stimuli to a meaningful picture of the world around us" (Siet et al., 2007, p. 444). From a food safety perspective, consumer perception is the "psychological interpretation which influences the attitudes and behavior of consumers with respect to the purchase of food products" (Ruth & Morris, 2001, p. 170). For purposes of this study, the phrase refers to the research subject's ability to identify a particular food allergen as a result of claim(s) suggested by the brand name itself or via allergen ingredient information disclosed on the food product's Nutrition Facts Panel.

Trust: Trust is defined as follows: "When one party has confidence in an exchange partner's reliability and integrity" (Morgan & Shelby, 1994, p. 23). For this study, the focal point is consumer trust in the claim and brand name.

Purchase intention: This term refers to the consumer's intention to buy a specific product (Laroche, Kim, & Zhou, 1996). For purposes of this research, purchase intention pertains to the likelihood the research subject will purchase the food product in question.

Assumptions

Fifteen assumptions were made in this research study:

1. Companies want to provide the best information available for the good of the company, the consumer, and society at large.
2. Consumers do make purchase decisions based on the food product label.

3. A phenomenon that needs to be scientifically and empirically investigated is this: the effect of Product Label Claim and Nutrition Facts Panel information on food allergic consumers and stakeholders of food allergic consumers.
4. The researcher believes that certain food products within the marketplace contain ingredient labeling and Product Label Claims that are confusing and deceptive to food allergic consumers and stakeholders of food allergic consumers.
5. By evaluating the congruency between Product Label Claim and Nutrition Facts Panel information, researchers and practitioners will obtain new insight and comprehension into this relatively unresearched and emerging field of study.
6. The researcher believes the subject matter of this study, product label information for allergic consumers, behaves in a matter consistent with current marketing knowledge.
7. The researcher will be able to statistically analyze scientifically collected empirical data via a statistically validated questionnaire.
8. With the use of a statistically validated questionnaire, the researcher will collect pertinent information that appropriately reflects stakeholder information relating to the congruency of Product Label Claim and Nutrition Facts Panel.
9. The researcher presumes that a representative sample of allergic consumers and stakeholders of food allergic consumers is achievable.
10. The researcher will control for prior product experience through the use of "mock-up" and/or slightly modified nationally available food product labels and Nutrition Facts Panels based on nationally available food products.

11. The researcher presumes that a random selection of allergic consumers and stakeholders of food allergic consumers will yield subjects who will be able to self-rank their food allergen identification skill sets on a scale from "expert/knowledgeable" to "inexpert/unknowledgeable."
12. Due to the use of "mock-up" food product labels, the researcher presumes that the subjects will not have consumed the specific food product identified on the food product label used in the study questionnaire.
13. The researcher presumes that some subjects may have had previous exposure to one or more food product labels that are complimentary in nature to the "mock-up" food products used in the study questionnaire.
14. Due to the researcher's selection and use of "mock-up" and/or slightly modified nationally available food product labels, the researcher anticipates subjects will have varying degrees of familiarity with the food product type.
15. The findings of this research study will likely impact food allergic consumers and stakeholders of food allergic consumers, public policy, and practitioners.

CHAPTER II

CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

Introduction

Despite ever-increasing awareness and diagnosis of food allergy in the present global society, research pertaining to food allergy stakeholders is in its infancy in both Europe and the United States. The overwhelming majority of research studies have highlighted issues food allergy stakeholders encounter with various forms of information found on food product labels. In fact, social policy has only recently implemented mandatory guidelines and measures intended to assist food allergy stakeholders in the food retail environment (USDHHS, 2006, 2009a; United States Department of Health and Human Services [USDHHS], 2013). Before the implementation of these public policies, food allergy stakeholders were unable to purchase and consume a large number of the available packaged food items due to fear of accidental ingestion of a food allergen not disclosed on the food product label.

Prior to the implementation of the U.S. Food Allergen Labeling and Consumer Protection Act, food manufacturers were not required to disclose each ingredient contained in a food product. Due to a lack of regulation in food ingredient disclosure, food allergy stakeholders were frequently unable to determine if a food product was safe to eat. For example, preceding FALCPA, food allergy stakeholders had two choices: (a)

abstain from the majority of packaged food items, or (b) examine food product labels for allergens and trust the food product did not contain an undisclosed allergen not noted on the product label.

Before FALCPA, many food allergy stakeholders had little alternative but to risk consuming a packaged food product if the ingredient list did not specifically identify the food allergen. The potential consequences of such an act could have been life-threatening because the allergen may not have been disclosed or easily recognized. Prior to FALCPA, many ingredient names or terms for dairy and dairy derivatives were listed as commonly found in food products that dairy allergic stakeholders were to identify in order to avoid inadvertent consumption of dairy. The following are partial lists:

> Ingredients by Name:
>
> Acidophilus Milk, Ammonium Caseinate, Butter, Butter Fat , Butter Oil, Butter Solids, Buttermilk, Buttermilk Powder, Calcium Caseinate, Casein, Caseinate, Cheese, Condensed Milk, Cottage Cheese, Cream, Curds, Custard, Delactosed Whey, Demineralized Whey, Dry Milk Powder, Dry Milk Solids, Evaporated Milk, Goat Milk, Half & Half, Hydrolyzed Casein, Hydrolyzed Milk Protein, Iron Caseinate, Lactalbumin, Lactoferrin, Lactoglobulin, Lactose, Lactulose, Low-Fat Milk, Magnesium Caseinate, Malted Milk, Milk, Milk Derivative, Milk Fat, Milk Powder, Milk Protein, Milk Solids, Natural Butter Flavor, Nonfat Milk, Nougat, Paneer, Potassium Caseinate, Pudding, Recaldent, Rennet Casein, Skim Milk, Sodium Caseinate, Sour Cream, Sour Milk Solids, Sweetened Condensed Milk, Sweet Whey, Whey, Whey Powder, Whey Protein Concentrate, Whey Protein, Hydrolysate, Whipped Cream,Whipped Topping, Whole Milk, Yogurt and Zinc. (GoDairyFree, 2012**,** para. 3)
>
> Ingredients by Term:
>
> Artificial or Natural Flavorings, Fat Replacers, Galactose, High Protein, Protein, Hydroloized Vegetable Protein, Lactic Acid Starter Culture, Lactobacillus, Margarine and Prebiotics. (GoDairyFree, 2012, para. 4)

Through FALCPA, the U.S. government has taken steps to initiate food product label changes to help alleviate the mystery pertaining to food product ingredients. This is a first step; additional steps need to be taken to eliminate confusion and labeling issues

that, while compliant under FALCPA, are still problematic to food allergy stakeholders. The example below illustrates problematic food allergen labeling addressed by the FDA on August 2, 2013.

To clear any ambiguity regarding the definition of "Gluten-Free," the FDA attempted to clearly defined the term and detail how food product manufacturers may use it (USDHHS, 2013). Prior to the implementation of this recent regulatory change, food manufacturers were permitted to use terms such as "Gluten-Free" on food product packaging, despite the fact the food product contained gluten. Food product manufacturers had until August 5, 2014, to comply with these mandates (USDHHS, 2013). The FDA further noted that noncompliant manufacturers would be subject to regulatory action if product labels were not rectified by the August 2014 deadline (USDHHS, 2013). In addition to issues addressed via public policy, researchers have identified additional concerns.

For example, in an exploratory research study conducted in the Netherlands and Greece, Cornelisse-Vermaat et al. (2008) found (a) food allergy consumers have perceived problems with the readability of food product labels, (b) product ingredients lists were found to be insufficient in identifying food allergens contained in the food product, (c) consumers were not satisfied with current labeling guidelines for food allergen disclosure, and (d) food allergy consumers relied on product claims and Nutrition Facts Panel information to manage their allergies. Based on these findings, the researchers concluded that further research is needed to understand the best manner to convey food allergen information on food product labels (Cornelisse-Vermaat et al., 2008).

Additionally, not only have actual ingredient disclosures proved troublesome, but precautionary allergen labeling has added further complexity for identification of food allergens contained in the packaged food product. Wherein allergen disclosures are frequently government mandated, precautionary allergen labeling is voluntary in nature (Marchisotto et al., 2016). Similar to subpar food allergen disclosure guidelines less than a decade ago, precautionary allergen labeling is another area that has created confusion among food allergic stakeholders (Marchisotto et al., 2016). Since these precautionary allergen labeling disclosures are often imprecise or fraught with generalized nonspecific "cautions," these precautionary allergen labels may create additional confusion for the target audience, food allergic stakeholders.

Effective Risk Communications: Elaboration Likelihood Model

Prior research has highlighted the importance of assessing and understanding effective communications for promoting health risks to consumers (Rucker & Petty, 2006). Despite the important role nutrition labels and claims contribute to healthy food selection and consumption behaviors of consumers, several international research studies have found consumers frequently encounter issues with readability and comprehension of information contained on the food product label (Mhurchu & Gorton, 2007; Moorman, 1990). One method of understanding the effectiveness of health risk communications, and ultimately consumer selection and consumption of a given food product, is through the use of the Elaboration Likelihood Model (ELM) of persuasion and through proper measurement of attitude certainty (Rucker & Petty, 2006). The ELM framework was developed to understand consumer attitude change and persuasion (Frewer, Howard, Hedderley, & Shepherd, 1997; Rucker & Petty, 2006; Van Steenburg, 2012).

ELM focuses on how persuasion operates by focusing on two paths of attitude persuasion: the central route and the peripheral route (Frewer et al., 1997; Rucker & Petty, 2006; Van Steenburg, 2012). The first pathway, the central route, is an intentional and more in-depth processing by the consumer of issue-relevant information (Frewer et al., 1997; Rucker & Petty, 2006; Van Steenburg, 2012). The second pathway, the peripheral route, is a less involved method of processing that takes place when the consumer uses cues and simple associations (Frewer et al., 1997; Rucker & Petty, 2006; Van Steenburg, 2012).

The ELM framework is concerned with initial changes in attitude and is able to distinguish consequential attitude changes from attitude changes that are less consequential or impactful (Rucker & Petty, 2006). Rucker and Petty (2006) noted, "Thinking or elaboration put forth by an audience can be placed along a continuum" anchored by two distinct points: high elaboration and low elaboration (p. 40). The amount of elaboration exhibited by a particular person consists of a combination of "motivation and ability to process the available information" (Rucker & Petty, 2006, p. 40). Individuals who exhibit high levels of elaboration use the central route of processing and individuals with low levels of elaboration use the peripheral route of processing (Frewer et al., 1997; Rucker & Petty, 2006; Van Steenburg, 2012). In addition, an attitude change that occurs with higher certainty or increased confidence is known as a consequential attitude change (Rucker & Petty, 2006).

When a researcher uses the ELM, it is important to understand a number of key aspects in developing risk communications for consumers. Although ELM research studies present and refer to components of ELM in varying ways, for present study

purposes, ELM was outlined in a step-by-step fashion consistent with that of Rucker and Petty (2006). In the first step, it is essential to understand the elaboration level of the intended audience of the communicated message (Frewer et al., 1997; Rucker & Petty, 2006; Van Steenburg, 2012). Intended audiences, either central or peripheral processers, are inclined to process information differently (Frewer et al., 1997; Rucker & Petty, 2006; Van Steenburg, 2012). Central processers, those who exhibit high levels of elaboration, exhibit high levels of motivation and an increased ability to process information deemed important (Frewer et al., 1997; Rucker & Petty, 2006; Van Steenburg, 2012). Unlike central processors, individuals classified as peripheral processors will use cues and simple associations to process the communicated message in a less involved manner than that of central processors (Frewer et al., 1997; Rucker & Petty, 2006; Van Steenburg, 2012). It is of utmost importance to determine if the audience is naturally inclined to scrutinize the message (Frewer et al., 1997; Rucker & Petty, 2006; Van Steenburg, 2012).

In the second step, it is necessary to understand the characteristics of the communicated message and determine if it is suitable for the intended audience (Frewer et al., 1997; Rucker & Petty, 2006; Van Steenburg, 2012). A message with a strong argument is intended for a central processor; a message with peripheral cues or simple inferences is intended for a peripheral processor (Frewer et al., 1997; Rucker & Petty, 2006; Van Steenburg, 2012). It is also essential to note that a message can appeal to both peripheral and central processors if it contains both strong arguments and peripheral cues (Rucker & Petty, 2006).

In the third step, it is important to determine the type of message one intends to convey, whether it is a message to create an enduring attitude change or an immediate attitude change (Rucker & Petty, 2006). Steps four and five pertain to determining message fit among the intended audiences (peripheral vs. central processors), the characteristics of the message, and the objective of the message both conceptually and empirically (Frewer et al., 1997; Rucker & Petty, 2006; Van Steenburg, 2012). The sixth and final step is to determine the message effectiveness (Frewer et al., 1997; Rucker & Petty, 2006; Van Steenburg, 2012).

Application of these steps in developing risk communications for consumers proved invaluable for the current study. The first step of the ELM was met because this research tested an audience inclined to scrutinizing labels, food allergic stakeholders. The second step was met because the message itself, allergen information located on the food product label, was suitable for the intended audience, food allergic stakeholders. The third step was met because the food product label conveyed allergen information to the food allergic stakeholder to affect an attitude change. Additionally, the fourth step was met because congruency existed among the audience's elaboration level (food allergen stakeholders), the characteristics of the message (food allergen information), and the message objectives (accurate conveyance of food allergen information to the food allergic stakeholder).

The fifth step of the model tested understanding of the characteristics of the communicated allergen message (via Product Label Claim and Nutrition Facts Panel information) and the objective of the allergen message from a conceptual and an empirical basis. Lastly, the sixth step evaluated the effectiveness of the food allergen

message, thereby indicating if changes to the food allergen message were needed for proper conveyance of food allergen information to the food allergic stakeholder. Ultimately, this researcher sought to understand if food allergic stakeholders are able to make safe purchase decisions (via identification and avoidance of certain food allergens) through the use of FDA-compliant food product label allergen communications.

Elaboration Likelihood Model: Application and Findings in Research

In a study with 160 respondents conducted in the United Kingdom, Frewer et al. (1997) investigated the impact of two specific health hazards, microbiological food poisoning and excessive consumption of alcohol, to better understand effective risk communication strategies for consumers. The researchers found ELM invaluable in understanding the determinants of risk communications to consumers (Frewer et al., 1997). The findings highlight the significance of trust in the information source and trust in information content and their impact in relation to perceived characteristics of a particular health hazard (Frewer et al., 1997).

Study participants were found to have reduced risk perceptions if the source was not deemed to be credible (Frewer et al., 1997). With regard to source credibility, consumer perceptions of health risks were found to be lower if the risk communication came from a governmental source and higher if the risk communication came from a medical source (Frewer et al., 1997). Additionally, the food hazard itself and persuasive content were important in establishing the degree of elaboration (high vs. low) that occurred (Frewer et al., 1997). Further, the finding suggested "that people will fail to heed messages from a highly credible source" if the message is believed to apply to other people and not themselves (Frewer et al., 1997, p. 768). Therefore, irrespective of source

credibility, if a particular food safety hazard is not perceived as having an impact on oneself, then the risk message is not recognized or observed.

Importance of Findings

These findings are important in their application to food allergy stakeholders. First, since food allergy stakeholders face high food hazard risk due to possible allergic reaction from allergen ingestion, the degree of food allergy stakeholder elaboration will prove important in understanding food allergen communications via food product labels. The current researcher presumed that since food allergic stakeholders must carefully read food product labels to identify allergens, this population likely functioned in a high elaboration mindset, unlike persons whose immediate health and safety does not depend on allergen identification in foods. Therefore, the researcher presumed elaboration would be divided into two groups, low and high elaboration.

Second, an investigation of the effect of source credibility and the persuasive content of the hazard message is important in understanding how food allergic stakeholders perceive the food allergen message(s). This assertion is important because food allergic stakeholder perception of these food allergen message(s) affects conveyance of actual allergens contained in the food, and ultimately, purchase intention of the food product. An investigation of this high elaboration set of consumers will likely yield unique findings based on the immediacy and severity of the risk of an allergic reaction.

Consistent with the study by Frewer et al. (1997), multiple research studies implementing ELM support the finding that elaboration will be higher if the communicated message is relevant to the intended recipient. In a study investigating

Canadian smokers and tobacco warning labels, Hammond, Fong, McDonald, Brown, and Cameron (2004) found not only was there high elaboration among smokers with tobacco health warning labels, but also that 50% wanted to see additional health information on cigarette packages. Um (2008) found elaboration to be lower when an argument or message was perceived as less important to the recipient, and higher when the argument was deemed more pertinent to the recipient.

These findings are also consistent with a United States research study that tested warning and risk messages with gamblers. Munoz, Chebat, and Suissa (2010) found message recipients (gamblers) with high involvement engaged in additional information processing compared to those subjects with low involvement. These research studies establish significant support for the relevance/elaboration linkage relating to warning communications and their intended recipients. Therefore, the use of ELM in the present study was assumed to produce robust findings because food allergy stakeholders are the intended recipient of food allergen warning and risk warnings communicated through the food product label.

Food Allergy Management

As with any disease or medical disorder, proper medical treatment and lifestyle changes are needed for individuals to function in everyday society. This generalization applies as well to food allergic consumers or stakeholders of food allergic consumers. In fact, unlike conditions that may be treated with medications, therapy, surgery, or other medical remedies afforded through modern medicine, food allergy is currently an incurable disease (America, 2011). For food allergy sufferers and food allergy stakeholders to safely and effectively manage food allergies, they require access to easily

understandable food product ingredient information (Barnett, Leftwich, et al., 2011; Barnett, Muncer, et al., 2011; Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Crevel, 2001, 2002; Crevel et al., 2008; Miles et al., 2005; Mills et al., 2007; Mills et al., 2004; Sakellariou et al., 2010; Simons et al., 2005; Taylor & Hefle, 2001). Without access to accurate ingredient information, allergy sufferers are unable to properly identify allergens to safely consume packaged foods.

Of approximately 16 research studies identified by the current researcher, 14 (Appendix B, Table B1, column C) clearly indicate access to information to allergenic substances in food products is needed for effective allergy avoidance (Barnett, Leftwich, et al., 2011; Barnett. Muncer,et al., 2011; Buhl.et al., 2008; Cornelisse-Vermaat.et al., 2008; Crevel, 2001, 2002; Crevel.et al., 2008; Miles.et al., 2005; Mills.et al., 2007; Mills.et al., 2004; Sakellariou.et al., 2010; Simons.et al., 2005; Taylor & Hefle, 2001). This finding was also supported and reinforced by the AAAI (2012). To correctly manage food allergy, the AAAI clearly stated food allergy sufferers must have access to food product labels to evaluate if the food product contains a known allergenic ingredient that must be avoided by the allergy afflicted individual (American Academy of Allergy Asthma & Immunology [AAAI], 2012). As supported by academic research, medical professionals, and various medical associations, food allergy stakeholders require access to information of allergenic substances in food products. Without this information, food allergic consumers are unable to effectively manage their disease.

Importance of Product Label

Product Label: Nonfood Allergy Setting

Research investigating the importance of nutrition disclosure on food product labels spans several decades. As researchers have expanded their scope of knowledge pertaining to food product labels and effective communication of nutrition information, to a certain extent common findings and problems that existed then still exist today. For example, in a United States research study conducted in the early 1990s, researchers found "effectively designed nutrition disclosures facilitate information utilization" (Moorman, 1990, p. 371). Specifically, as health dangers associated with a particular nutrient or ingredient increase and the associated dangers are understood, "consumers are able to process information, elaborate upon it to a greater extent, and make better decisions" (Moorman, 1990, p. 371). This finding is particularly important to the current research study since the health dangers associated with accidental ingestion of a known allergen can be harmful and/or fatal to certain food allergic consumers.

In a U.S. research study that tested motivation for processing nutrition information and the effects of nutrition package claims and nutrition facts panel information on consumers, Keller et al. (1997) tested consumer product evaluations based on nutritional claims relating to fat and calorie content. This study was conducted after the implementation of new governmental guidelines intended to make food product labels clearer and easier to understand (Keller et al., 1997). Findings indicated that when consumers were provided with Nutrition Facts Panel information commonly on the back of the food product label, the nutrition claims found on the front of the product label did not positively impact purchase intention (Keller et al., 1997). The research further found

lower perceptions of credibility when consumers were able to identify inconsistent (incongruent) information between Product Label Claims and Nutrition Facts Panel information. Such inconsistencies were noted only by consumers when they observed an apparent disparity i.e., a claim of 99% fat free when the Nutrition Facts Panel indicated a high fat content (Keller et al., 1997).

Consistent with the Keller et al. (1997) study, the current research tested subjects in an environment postimplementation of new governmental regulation. In this newer regulatory environment for food allergen disclosure, this research sought to test if incongruencies between and Product Label Claim and Nutrition Facts Panel information affect food allergic stakeholders' perceptions of the product and their purchase intention for the product. Additionally, given the importance of allergen identification for food allergy stakeholders, this research tested how readily food allergy stakeholders were able to identify incongruencies between Product Label Claim and Nutrition Facts Panel information. Identifying these incongruencies is important because accidental ingestions of an allergen can have immediate life-threatening consequences, unlike the less instantaneous consequences of ingesting a food with, for example, an elevated fat content.

Although not food specific, a research study conducted with wine consumers in Italy investigated the effects of various wine sources of information, including disclosures for nutritional information, health warnings, and consumption guidelines. Annunziata, Pomarici, Vecchio, and Mariani (2016) conveyed the information though various methods, including written calorie counts, symbols, symbols with claims, and claims. Findings indicated consumer divergent consumer preferences, segmented by

demographic profiles, including education (Annunziata et al., 2016). Three clusters of persons were identified with individual preferences. (a) Women over 55 years of age preferred detailed nutritional labels. (b) Men under 44 years of age preferred less detailed health warnings. (c) Individuals who had difficulty understanding detailed nutritional and health labels preferred a less detailed method, utilizing symbols with calorie counts (Annunziata et al., 2016).

The findings from the Annunziata et al. (2016) study highlight the need to utilize communications that may not be the preferred method of delivery by all parties but are designed and presented in a fashion that is understood by most readers of the label. Therefore, Annunziata et al. concluded that most effective was the introduction of less detailed and easier to understand visual communications, followed by a health warning and a basic safe consumption recommendation. These findings are important for the current research study, since its purpose and implications involve effective allergen information delivery and conveyance of allergen information to the food allergic stakeholder.

In a research study conducted in France, Ducrot et al. (2016) conclusions mirrored findings of the Annunziata et al. (2016) study conducted in Italy. French respondents were presented with five separate exposures, with each exposure limited to front of label nutrition information (Ducrot et al., 2016). Respondents were able to better identify nutrition information such as fat and sodium counts through a five-color scale ranging from green to red, with corresponding letters A (healthy) to E (least healthy) presented on the front of the product label (Ducrot et al., 2016). These findings are again important for the current research study because effective allergen information delivery

and conveyance of allergen information to the food allergic stakeholder are the primary study purposes.

Caution must be exercised with the use of visual cues, symbols, and descriptions on the packaged food product label. Fenko, Kersten, and Bialkova (2016) investigated Dutch consumer skepticism towards labels on the front of food packages, noting that increased product label complexity due to claims and symbols increased consumer skepticism. Results indicated consumers were more skeptical towards hedonic labels, those conveying a pleasurable product attribute, e.g., "traditional recipe," and less skeptical towards health-related labels (Fenko et al., 2016, p. 82).

Moreover, the research indicated an increased likelihood of hedonic product selection when presented with a congruent hedonic claim versus a health claim (Fenko et al., 2016). Specifically, the researchers suggested that a multisensory product experience may reduce consumer skepticism while favorably impacting product evaluations and simultaneously increasing the likelihood of product selection and purchase intention (Fenko et al., 2016). These findings are important because it is the present researcher's conviction that skepticism must be minimized to maximize positive product evaluations that result in health-maintaining product selection and purchase intention.

Not only are the methods of communication important, but research has established that the catalyst for initial communication of the message is of equal importance (Wilson et al., 2015). In a study investigating regulatory communications of food safety with regard to food systems, regulators communicated food safety to consumers in two ways: proactive communications and reactive communications (Wilson et al., 2015). Proactive communications with consumers were found to be superior for

various reasons, including the creation of relationship building, enhanced trust, increased comprehension of the message, and positive perception of the communicated message and the communicator(Wilson et al., 2015).

The ultimate goal of proactive communications is to increase knowledge and dissemination of the specific communication (Wilson et al., 2015). Irrespective of the safety message, increased knowledge is needed to better understand how regulators communicate and how the communications from regulators are perceived by consumers (Wilson et al., 2015). Through these communications, regulators can help increase trust and ensure confidence in not only the food system but also in the individual products that comply with regulatory requirements (Tonkin, Webb, Coveney, Meyer, & Wilson, 2016; Tonkin, Wilson, Coveney, Webb , & Meyer, 2015).

Lastly, in Australia and New Zealand, Mhurchu and Gorton (2007) compiled a review of literature to better understand the current state of research as it relates to Australian and New Zealand consumers' use and understanding of food product claims and nutrition labels. Sixteen research studies were identified as relevant and included in the review of literature (Mhurchu & Gorton, 2007). Of these studies, only one evaluated actual consumer use and understanding of labels; the remaining studies relied on self-reported consumer data regarding use and understanding of labels (Mhurchu & Gorton, 2007).

Of significant importance, the single study that evaluated actual consumer use and understanding of labels found actual use and understanding of product labels was considerably lower than expected based on self-reported data (Mhurchu & Gorton, 2007). Despite the fact that multiple research studies have investigated consumer use and

understanding of nutrition labels using self-reported data, conflicting findings from observable consumer data show researchers still have an insufficient and even poor understanding of actual consumers' use of product labels (Mhurchu & Gorton, 2007).

These findings are important for the current study since, similar to the Mhurchu and Gorton (2007) study, a limited number of research studies that investigated food allergic consumers actually sampled food allergic consumers or food allergy stakeholders and tested their understanding and use of food product labels. Therefore, sampling food allergy stakeholders in an effort to understand their use of product label information and Nutrition Facts Panel information should contribute to the body of current academic research. First, current findings will help advance current research by sampling both food allergic consumers and food allergy stakeholders in an effort to better understand how this population uses food labeling to make purchase and consumption decisions.

Second, with the researcher's use of both incongruent and congruent mock labels of actual food products found in the marketplace, this study will likely help researchers, manufacturers, and policy makers better understand the impact of food labeling incongruencies and how they affect food allergy stakeholder purchase intentions. Understanding of food allergy stakeholder purchase intention is critical because stakeholders' food consumption is solely based on making safe food choices. To make safe food choices, these individuals require access to accurate and clear ingredient information in order to avoid particular allergens.

Product Label: Food Allergy Setting

The preceding section substantiated that food allergy stakeholders require access to accurate food product ingredient information so that food allergic consumers may

effectively and safely manage their food allergy. When shopping for packaged food products, food allergy stakeholders commonly rely on a single information source during the shopping experience, the product label. Fifteen of the 16 studies reviewed by the researcher (Appendix B, Table B1, column A) concluded that the product label is particularly important in allergen identification (Barnett, Leftwich, et al., 2011; Barnett, Muncer, et al., 2011; Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Crevel, 2001, 2002; Crevel et al., 2008; Miles et al., 2005; Miles et al., 2006; Mills et al., 2007; Mills et al., 2004; Sakellariou et al., 2010; Simons et al., 2005; Taylor & Hefle, 2001; Verrill & Choinere, 2009; Voordouw et al., 2012).

For example, in one such study conducted within Germany and the Netherlands, referred to earlier, Voordouw et al. (2012) investigated food allergic consumer preferences for information delivery of allergenic ingredients. Study participants examined three methods of information delivery that were previously identified within the authors' prior research study. The three prototype delivery methods were presented in three distinct mediums; (a) product label, (b) a handheld electronic scanner utilized during the shopping experience, and (c) an information booklet that was carried with the shopper (Voordouw et al., 2012). The findings indicated allergic consumers trusted and preferred food product ingredient information delivery via the product label over other sources of food allergen dissemination (Voordouw et al., 2012).

In a study conducted in the United Kingdom after the implementation of allergen disclosure legislation, researchers investigated the methods that peanut and nut-allergic consumers used to evaluate if a product was deemed safe to consume based on the allergen contained in the food product. Findings showed that these food allergic

consumers "used the product brand or name as a source for their risk assessment, reflecting on prior experience with the product" (Barnett, Leftwich, et al., 2011, p. 972). If prior experience was not helpful in allergen evaluation, the food allergic consumers used "printed packet information such as ingredients lists" (Barnett, Leftwich, et al., 2011, p. 972). In summary, the researchers found food allergic consumers believed further changes were needed to improve the delivery of allergen information on product labels since "various elements of the packet are used as part of the process of risk assessment" (Barnett, Leftwich, et al., 2011, p. 978).

Lastly, in a study conducted in Greece and the Netherlands after implementation of allergen disclosure legislation, Cornelisse-Vermaat et al. (2008) tested food allergic consumer use of food product labels for allergen identification. The food product label was specifically tested because food product labels are the sole manner in which food allergen information can be readily obtained in retail environments. The researchers found food allergic consumers encountered several issues with using food product labels to identify allergens. The information conveyed on the food product labeling was unsatisfactory and did not clearly communicate the allergen, often leading to a stressful shopping experience for the food allergic consumers. The researchers concluded if allergen disclosures on food product labels were not optimized, inaccurate disclosures would likely lead to a "detrimental quality of life of food-allergic consumers" (Cornelisse-Vermaat et al., 2008, p. 119).

These research studies reinforce the importance of the food product label as accurate, unambiguous, and congruent. The label should be a primary information source for allergen evaluation by the food allergic stakeholder. Therefore, without access to the

food product label or other readily available resource, food allergic consumers are unable to effectively manage their disease.

Allergen Labeling on Product Labels

With the product label identified as the preferred source for allergen evaluation, it is now necessary to evaluate its communicative effectiveness. A U.S. based research study found food product label information to be the single strongest tool in the identification of food allergens among allergic consumers and caretakers of allergic consumers (Simons et al., 2005). Most allergic consumers "relied on food package labeling and further information from manufacturers to determine if a food was safe to eat" (Simons et al., 2005, p. 427). Results also indicated 99% of allergic consumers and their caretakers read product labels during the shopping experience, and 94% reread the same labels during cooking and food preparation to prevent the accidental introduction of allergenic food ingredients (Simons et al., 2005).

Generally speaking, food allergy stakeholders utilize various aspects of the product label for identification of allergens (see Appendix B, Table B1, columns A, D, E-G) (Barnett, Leftwich, et al., 2011; Barnett, Muncer, et al., 2011; Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Crevel, 2001, 2002; Crevel et al., 2008; Miles et al., 2005; Mills et al., 2007; Mills et al., 2004; Sakellariou et al., 2010; Simons et al., 2005; Taylor & Hefle, 2001; Verrill & Choinere, 2009). The overwhelming majority of research studies reviewed for this research, 15 of the 16, substantiated that food allergy stakeholders utilize product label components such as the food product name, sample product pictures, and allergen statements located on the front of the food product label, and information such as ingredient listings and food allergen disclosures found in the

Nutrition Facts Panel. Collectively, these studies reinforce the conclusion that food allergy stakeholders use one or more forms of information conveyed through the food product label to safely manage their food allergy.

Due to the relatively small number of research studies investigating food allergens, few researchers have investigated the effective conveyance of information located on the product label to the food allergy stakeholder. In fact, of the research studies that have investigated the effectiveness of product label information dissemination to the food allergy stakeholder (Appendix B, Table B1, columns B and I), every study either concluded or the researcher indicated that food allergy stakeholders have difficulty using the information found on the food product label (Barnett, Leftwich, et al., 2011; Barnett, Muncer, et al., 2011; Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Miles et al., 2006; Mills et al., 2004; Sakellariou et al., 2010). These findings are troublesome, since product label information is the preferred and frequently the only method of allergen evaluation and detection in packaged food products (Appendix B, Table B1, columns A and D) (Barnett, Leftwich, et al., 2011; Barnett, Muncer et al., 2011; Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Crevel, 2001, 2002;Crevel et al., 2008; Miles et al., 2005; Mills et al., 2007; Mills et al., 2004; Sakellariou et al., 2010; Simons et al., 2005; Taylor & Hefle, 2001; Verrill & Choinere, 2009).

As the previous studies indicate, not only did food allergy stakeholders have problems using product labels for evaluation of allergens, the studies found also that allergen labeling needs improvement (Appendix B, Table B1, column I) (Barnett, Leftwich, et al., 2011; Barnett, Muncer, et al., 2011; Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Crevel et al., 2008; Miles et al., 2006; Sakellariou et al., 2010;

Taylor & Hefle, 2001; Voordouw et al., 2012). A number of these international studies were conducted after governmental mandates for allergen labeling were instituted. Despite the institution of these initial government mandates, allergen identification was still problematic for food allergy stakeholders. Although there is no clear consensus among researchers with how to best convey allergen information to food allergy stakeholders, it is clear food allergen labeling improvements are needed (Cornelisse-Vermaat et al., 2008).

Stakeholder Purchase Intention

Research has shown that consumer trust in manufacturer/brand name is negatively impacted when an incongruency is found to exist between the Product Label Claim and Nutrition Facts Panel information(Garretson & Burton, 2000). Given the established link between trust in brand and purchase intention, incongruency between Product Label Claim and Nutrition Facts Panel information should reduce the likelihood of purchase by the food allergy stakeholder (Laroche et al., 1996). Furthermore, research has established that food allergic consumers trust the brand name and the brand name's conveyance of allergic substances in the food product in determining if a product is suitable for purchase and consumption (Fenko et al., 2016).

As indicated by prior research, food allergic consumers and food allergy stakeholders utilize Product Label Claim and Nutrition Facts Panel information and to assess if a food is safe to consume (Cornelisse-Vermaat et al., 2008; Simons et al., 2005; Voordouw et al., 2012). If a food is deemed safe to eat (free from a particular allergen) via a review of the food product's label, then the natural consequence of these actions is purchase of the product for consumption. Conversely, if a food is not deemed safe to eat

(indicating that the food product contains a particular allergen), then neither the food allergic consumer nor the food allergy stakeholder will purchase the product for consumption. Therefore, the following sections will describe the use of purchase intention, based on label information presented to the research subject, to determine if the food allergic stakeholder deems the product to be free from a particular allergen and therefore safe for consumption.

Allergen Information Communication: Product Label Claim

In the prior section, the researcher discussed Nutrition Facts Panel information as the first of two key sources of allergen information for food allergy stakeholders. Information not associated or disclosed within the Nutrition Facts Panel was identified in this study as a Product Label Claim. The researcher included any other statements, including the product name, product description, and disclosures not found on the Nutrition Facts Panel, as a Product Label Claim. In fact, seven separate research studies found that Product Label Claims are important in allergen evaluation (Barnett, Leftwich, et al., 2011; Barnett, Muncer, et al., 2011; Cornelisse-Vermaat et al., 2008; Mills et al., 2004; Simons et al., 2005; Verrill & Choinere, 2009; Voordouw et al., 2012).

In the Barnett, Leftwich, et al. (2011) study reviewed above with nut-allergic consumers, researchers identified a variety of methods that nut-allergic consumers utilized to determine if a food product contains a particular allergen. Participants sometimes used the product brand or name as a source for their risk assessment," and reflected "on prior experience with the product" (Barnett, Leftwich, et al., 2011, p. 972). The researchers further found that when the above allergen identification strategy did not assist with providing a confident determination of allergens contained in the food

product, "participants used other printed packet information such as the ingredients list" and allergy advice boxes (Barnett, Leftwich, et al., 2011, p. 972).

Furthermore, participants in the study concluded that statements such as "nut-free" located on the product packaging and a standardized approach to allergen labeling would prove invaluable (Barnett, Leftwich, et al., 2011). If U.S. food allergy stakeholders perceive similar product descriptors and Product Label Claims, such as "dairy-free," in a like manner, the results could be life-threatening. At the time of this research, dairy protein derivations such as sodium caseinate are, in accordance with FDA and FALCPA guidelines, permitted in food products even when the brand name insinuates a claim or the product label clearly conveys a message such as "dairy-free," despite containing dairy products (USDHHS, 2009b).

Figures A1 and A2 (Appendix A) show examples of food products that are clearly labeled as "dairy-free." However, these products contain dairy protein and/or dairy protein derivatives, both of which precipitate allergic reactions in dairy allergic consumers. These illustrations suggest that product descriptors and Product Label Claims are important in allergen evaluation by food allergy stakeholders and that prior use of food product influences food allergy stakeholder evaluation.

Nearly every study that researched food allergy stakeholders and food product labeling concluded that food allergy stakeholders utilize food product label information for allergen identification (Barnett, Leftwhich, et al., 2011; Barnett,Muncer, et al., 2011; Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Crevel, 2001, 2002; Crevel et al., 2008; Miles et al., 2005; Mills et al., 2007; Mills et al., 2004; Sakellariou et al., 2010; Simons et al., 2005; Taylor & Hefle, 2001; Verrill & Choinere, 2009). Most of these

studies focused on one or more components of allergen ingredient disclosure. Of these studies, only one investigated and supported the notion that the name of a food product influences food allergy stakeholders' evaluation of allergens contained within the food product (Barnett, Leftwich, et al., 2011). This finding aligns with studies that have been conducted with nonallergic stakeholders, discussed next.

One such nonfood-allergic stakeholder U.S.-based study, by Irmak et al. (2011), evaluated the impact of a product's name and its effects on food evaluation and consumption. The findings for this study indicated that dieters rely on and make purchase decisions based on the name of a food product (Irmak et al., 2011). If food allergy stakeholders utilize a product name in a similar fashion, the food allergic consumer may unknowingly consume an allergen and potentially suffer from a life-threatening allergic reaction. The research studies reviewed earlier suggest the name of the food product and other Product Label Claim(s) can be used as an evaluative tool by the food allergy stakeholder to determine if the food product is safe for consumption.

Allergen Information Communication: Nutrition Facts Panel Information

For purposes of this research, information located on the food product label was divided into two distinct categories: (a) information located within the Product Label Claim(s) and (b) information conveyed through Nutrition Facts Panel. Researchers have identified and substantiated food allergy stakeholders' use and preference for Nutrition Facts Panel information (Barnett, Leftwich, et al., 2011; Barnett, Muncer, et al., 2011; Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Mills et al., 2004; Simons et al., 2005; Taylor & Hefle, 2001; Verrill & Choinere, 2009). In a study of food product labeling with peanut and nut-allergic consumers in the United Kingdom, referred to earlier,

Nutrition Facts Panel information including ingredient lists and/or allergen disclosure statements were used to determine if a food product contained a particular type of nut allergen (Barnett, Leftwich, et al., 2011). This study also found that the nut-allergic consumers interpreted a product to be allergen-free if the label lacked a "contains" statement (Barnett, Leftwich, et al., 2011). If U.S. food allergic consumers process information similarly to their United Kingdom counterparts, the results could be life-threatening since, according to FDA guidelines, a "contains" statement is optional.

Prior research as reported above has supported the notion that Nutrition Facts Panel information is very important to allergen evaluation for food allergic stakeholders. Furthermore, the Barnett, Muncer, et al. (2011) study found that relevant ingredient information such as allergen disclosures were preferred to generic "may contain" disclosures that did not convey a definitive statement of allergens contained within the food product (Marchisotto et al., 2016).. These findings suggest that Nutrition Facts Panel information that conveys identified allergens will strongly impact consumer perception of ingredients contained within the food product.

Attitude Certainty on Purchase Intention

Attitude certainty, or attitudes held with certainty, are attitudes believed to be indicators likely to assess a guided action made by the consumer or otherwise result in important consequences (Rucker & Petty, 2006; Tormala & Petty, 2004). These attitudes are not static; rather, they are dynamic in the sense that a person's attitude can deviate over the course of time or through multiple exposures (Rucker & Petty, 2006; Tormala & Petty, 2004). The deviations can either increase or decrease in significance, wherein an attitude with increased significance will become more influential in guiding an

individual's actions and an attitude with decreased significance will be less influential (Rucker & Petty, 2006; Tormala & Petty, 2004). Changes in attitude certainty can be affected by a number of factors, including source credibility and effectiveness of the communicated message (Rucker & Petty, 2006).

A food allergy stakeholder may be faced with two concurrent sources of food allergen information, such as allergen labeling information located on the front of the product packaging via the Product Label Claim and alternative information from the Nutrition Facts Panel. In such a case, food allergy stakeholder attitude certainty based on the product and based on one's overall attitude that may change based on allergen labeling congruencies or incongruencies. As noted earlier, source credibility and effectiveness of the communicated message can affect attitude certainty. If a congruent allergen communication is perceived as more favorable than an incongruent food allergen message, attitude certainty is likely to increase if the message is perceived as congruent and decrease if the message perceived as incongruent. The model presented in this study sought to explain the impact of these congruencies on attitude certainty of product safety and overall attitude certainty towards the product. The hypotheses are presented in categories with accompanying discussion of previous research.

Attitude Certainty of Product Safety

H1a: Attitude certainty towards the product safety will be higher (lower) for individuals presented with congruent (incongruent) product packaging allergen information.

H1b: Attitude certainty towards the product safety will be higher (lower) for individuals presented with low (high) elaboration product packaging allergen information.

Overall Attitude Certainty

H2a: Overall attitude certainty will be higher (lower) for individuals presented with congruent (incongruent) product packaging allergen information.

H2b: Overall attitude certainty will be higher (lower) for individuals presented with low (high) elaboration product packaging allergen information.

Mediating Impacts of Attitude Certainty

Due to the integral function of attitude certainty and its influence upon purchase intention, the researcher also sought to investigate the mediating role, if any, of attitude certainty of product safety and overall attitude certainty in relation to initial purchase intention and purchase intention. That is, the researcher investigated whether access to congruent product package allergen information increase or decrease the difference, if any, between the initial purchase intention based on (a) the allergen information found on front of the food product label solely and (b) the change in purchase intention based on all allergen information found on the product package

H9a: Access to congruent (incongruent) product package allergen information increases (decreases) attitude certainty of product safety as compared to just seeing the product label alone.

H9b: Access to congruent (incongruent) product package allergen information increases (decreases) overall attitude certainty as compared to just seeing the product label alone.

Congruency of Communicated Allergen Information

Despite the established use and importance of Product Label Claims and Nutrition Facts Panel information by food allergy stakeholders, no research has been conducted to date with food this population that directly addresses congruencies between the Product Label Claim and Nutrition Facts Panel information. Further, only a small number of studies incorporated food allergy stakeholders as study participants while testing for food allergen labeling, and all of these studies were conducted in European countries (Cornelisse-Vermaat et al., 2008; Miles et al., 2005; Miles et al., 2006; Voordouw et al., 2012). The majority of these studies in which food allergy stakeholders were used to test the allergen message communicated via the food product label are detailed below.

The first study, by Vourdouw et al. (2012), consisted of food allergic consumers from the Netherlands and Germany, and the researchers found that when food allergic consumers were faced with other information delivery methods, they preferred allergen information delivery via the food product label. Additionally, the findings suggested food allergic consumers "preferred clear and unambiguous labeling on product packaging" (Voordouw et al., 2012, p. 76). A second study, by Cornelisse-Vermaat et al. (2008), used food allergic consumers from the Netherlands and Greece. The researchers found that, despite manufacturer adherence to recently passed legislation within the EU, food allergic consumers had difficulties with food product labeling, including readability of allergen information, visibility/accessibility of allergen information, and incongruencies with

multilingual labels disclosing allergens in one language while failing to disclose the allergens in an alternate language (Cornelisse-Vermaat et al., 2008).

In a third study, Miles et al. (2005) tested food allergic consumers from Austria, Spain and The Netherlands. The researchers focused on "low-allergen" food products, and findings showed that the majority of respondents desired clear labeling and trusted the manufacturers' labeling of "low-allergen" foods. In some cases, the respondents expressed interest in an independent body designed to check the validity of the manufacturers' allergen claims (Miles et al., 2005).

The fourth study, by Miles et al (2006), conducted in the United Kingdom tested various food allergy stakeholders, including food allergic consumers, spouses of food allergic adults, and parents of food allergic children to determine preferences for the delivery of allergen information.. The majority of the respondents favored clear and unambiguous food product label information as the preferred source of allergen information disclosure (Miles et al., 2006). The~~se~~ findings from these studies suggest researchers should continue to investigate information delivery via the food product label with food allergy stakeholders. Appendix B, Table B2, provides a synopsis of these studies.

Given the limited research, the researcher attempted to fill the gaps pertaining to congruencies between Product Label Claim and Nutrition Facts Panel information by conducting the current study with food allergy stakeholders to test for the effect of congruencies between Product Label Claim and Nutrition Facts Panel information. Prior research suggests that food allergic consumers may utilize both Product Label Claim and Nutrition Facts Panel information and during their product evaluation (Cornelisse-

Vermaat et al., 2008). Therefore, a key contribution of this study was to examine how the congruency between Product Label Claim and Nutrition Facts Panel affects consumer perception of actual ingredients contained within the food product.

Perception of Milk/Dairy Ingredients

H3a: Perception of milk/dairy will be higher (lower) for individuals presented with incongruent (congruent) product package allergen information.

H3b: Perception of milk/dairy will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.

In the determination of the effects of congruency between the Product Label Claim and Nutrition Facts Panel, this research was similar to a research study that focused on health claims such as "low-fat" made by manufacturers on food product labels (Garretson & Burton, 2000). In one section, the researchers tested for congruency between a generally recognized health claim, a claim relating to fat content such as "low-fat," and the actual Nutrition Facts Panel information depicting fat content in the food product (Garretson & Burton, 2000). The researchers found consumers had decreased trust with the label claim of "low-fat" when the claim itself was not consistent with actual product information located within the Nutrition Facts Panel (Garretson & Burton, 2000).

The current research study tested for similar perceptions, except that it tested for the congruency of an ingredient claim of a known allergen and the actual ingredients listed within the Nutrition Facts Panel.

Testing for congruency of ingredient claim of a known allergen with that of the actual ingredient contained within the food product is extremely important for food allergy stakeholders who may rely on these claims when selecting a food product. It must

be noted that the immediate health effects of participants in the Garretson and Burton (2000) study were not as serious (unknowingly consuming a higher fat food product) as those faced by food allergic consumers who may unknowingly consume an allergenic substance which may trigger an almost immediate severe allergic reaction. The findings of the Garretson and Burton (2000) study suggested that recognized incongruencies have negative consumer effects on trust of the claim, manufacturer credibility, and trust of the Nutrition Facts Panel itself.

Credibility of Claim

H4a: Perceived credibility of claim will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.

H4b: Perceived credibility of claim will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.

As noted above, consumer trust in manufacturer/brand name can be affected by the consumer's perception of congruency between the Product Label Claim and Nutrition Facts Panel information (Garretson & Burton, 2000). Trust takes place when one party has confidence in an exchange partner's reliability and integrity (Morgan & Hunt, 1994). Garretson and Burton (2000) found participants did in fact recognize misleading claims on a package that were not congruent with the information contained within the Nutrition Facts Panel. The study further found that "incongruencies of fat from the Nutrition Facts Panel and the claim on the front of the package generally are recognized, and this leads to significant effects on consumers' trust in the claim" (Garretson & Burton, 2000, p. 224). However, the current academic literature pertaining to allergic stakeholders has not addressed this subject area.

Trust in Nutrition Information

H5a: Trust in nutrition information will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.

H5b: Trust in nutrition information will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.

Trust in Brand and Label

H6a: Trust in brand and label will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.

H6b: Trust in brand and label will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.

In the current study, the researcher also investigated how the food allergy stakeholder's purchase intention was impacted by the reliability and integrity of the communicated allergen message by both the Product Label Claim and Nutrition Facts Panel located on the consumer packaged food product label. If the food allergy stakeholder is confident in the claim (i.e., the totality of the allergen communication via the Product Label Claim and Nutrition Facts Panel), then the food allergy stakeholder's willingness to rely on the information will be recognized by willingness to purchase, or purchase intention. Conversely, if the food allergy stakeholder is not confident in the communicated allergen message, when a known incongruency exists, then the consumer is less willing to purchase. Succinctly stated, if food allergy stakeholders are confident in the claim, then they are willing to partake in the exchange relationship via purchase intention; if food allergy stakeholders are not willing to partake in the exchange

relationship, then they are not confident and will likely be unwilling to purchase the food product.

Purchase Intention

H7a: Purchase intention is higher (lower) with congruent (incongruent) product package allergen information.

H7b: Purchase intention is higher (lower) with low (high) elaboration product package allergen information.

H8: Access to congruent (incongruent) product package allergen information increases (decreases) purchase intention, as compared to just seeing the product label alone.

H9: Access to congruent (incongruent) product package allergen information increases (decreases) attitude certainty of product safety, as compared to just seeing the product label alone.

H10: Access to congruent (incongruent) product package allergen information increases (decreases) overall attitude certainty, as compared to just seeing the product label alone.

Research Model Presented and Explained

The researcher-designed model depicted below in Figure 1(and Appendix A**,** Figure 4A) is presented in an effort to better understand the decision process that food allergy stakeholders use when evaluating product packaging information, specifically regarding the elaboration and congruency of Product Label Claim and Nutrition Facts Panel information. The model helps explain the role of product label information on food

allergy stakeholders' purchase intention. The focal point of the model is the investigation of elaboration and the effects of congruency, or the lack thereof, between Product Label Claim and Nutrition Facts Panel information on food allergy stakeholder attitude certainty of product safety, overall attitude certainty, perception of milk/dairy, perceived credibility in claim, trust in nutrition information, trust in brand and label, and purchase intention.

Consistent with the Elaboration Likelihood Model, the proposed model in Figure 1(also Figure 4A) attempts to explain both peripheral and central routes of processing through exposure to both a single stimulus and multiple stimuli. The right side of the model, Front and Back Label Exposure under High Levels of Elaboration, explains the less elaborate method of processing, the peripheral route; and the more elaborate method of processing, the central route. However, since the researcher analyzed data from a sample of a presumably high elaboration population, food allergy stakeholders, this study tested low versus high levels of elaboration. The information was presented to the research subject via a two-stimuli exposure through the Product Label Claim and Nutrition Facts Panel to better understand attitude certainty of product safety (H1a, H1b), overall attitude certainty of (H2a, H2b) perception of dairy/milk (H3a, H3b), perceived credibility in claim (H4a, H4b), trust in nutrition information (H5a, H5b), trust in brand and label (H6a, H6b), and the effect of congruence on purchase intention (H7a, H7b).

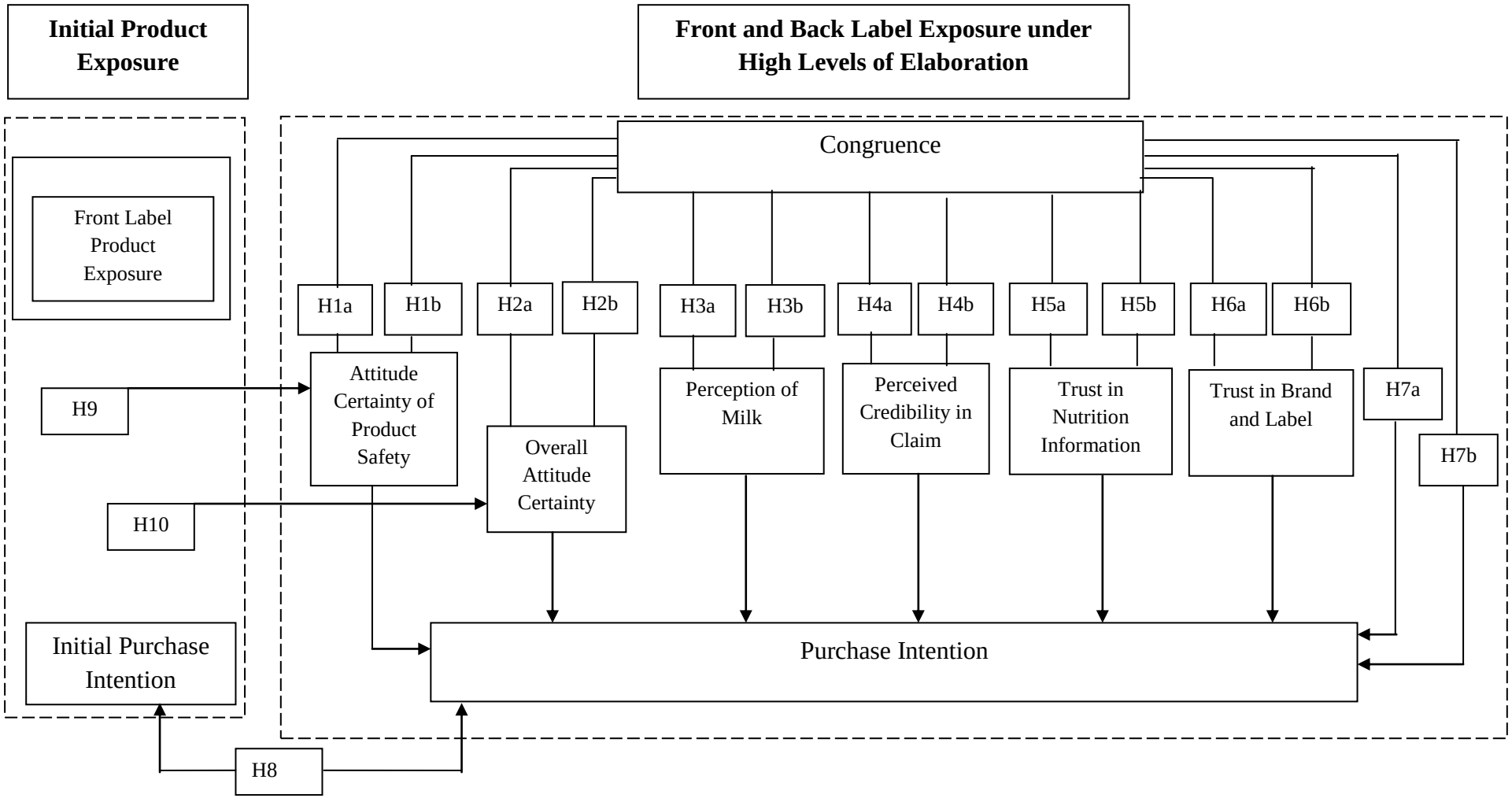


Figure 1. Research model: Purchase intention model for food allergic stakeholders (researcher-designed).

The left side of the model presented in Figure 1 (Figure A4), Initial Product Exposure, illustrates investigation of the change, if any, between initial purchase intention and purchase intention (H8), the impact of congruency of product package allergen information on attitude certainty of product safety as compared to just seeing the product label alone (H9), and the impact of congruency of product package allergen information on overall attitude certainty as compared to just seeing the product label alone (H10). Initial purchase intention of the research subject was measured after the research subject was exposed to one source of allergen information, the front label product exposure, consisting of all information contained on the front of the product label. Purchase intention was again measured after the research subject was presented with two sources of allergen information, the front and back label product exposure, consisting of all information contained on the front of the product label and the information contained within the Nutrition Facts Panel.

The framework depicted in Figure 1 (Figure A4) contains both explanatory and predictive significance. For a model to be considered explanatory, it must "show that the phenomenon to be explained was expected" (Hunt, 2002, p. 87). Additionally, "explanatory models should be pragmatic, intersubjectively certifiable, and have empirical content" (Hunt, 2002, p. 87). A model is considered pragmatic if it is "in accord with scientific practice," is considered intersubjectively certifiable if its explanatory structures are testable by independent researchers, and is considered to have empirical content if it is empirically testable (Hunt, 2002, p. 87).

The framework of this research is explanatory because it illustrates empirical evaluation and explanation of the selection and prepurchase process of food allergic consumers and food allergy stakeholders when evaluating food package information to determine if a food product is devoid of a particular allergen, thereby indicating it is safe to eat. Part of this evaluative process

pertains to information congruency between Product Label Claim(s) and Nutrition Facts Panel information and their effects on food allergy stakeholder attitude certainty, perception of ingredients, perceived credibility in claim, trust in Nutrition Facts Panel information, trust in brand and label, and purchase intention. If the research successfully explained these prepurchase processes, then predictions for purchase intention of food allergic consumers and food allergy stakeholders will likely be possible.

For example, a major assumption may be that the study findings indicate information incongruency negatively impacts purchase intention and trust in brand. Then, an adequate explanation of the phenomenon (purchase intention and consumer trust in brand from the perspective of a food allergic consumer or food allergy stakeholder), becomes potentially a prediction. A predication occurs when, after rigorous testing and retesting, the phenomenon predicted by the framework is congruent with the actual observed phenomenon (Hunt, 2002). Therefore, further testing would need to be conducted to determine the robustness of the framework's ability to predict actual observed phenomenon (Hunt, 2002). If the framework continues to adequately explain the phenomenon with additional testing, then its predictive powers have become further substantiated (Hunt, 2002).

Summary

This research aimed to further expand upon current academic literature as well as answer the call for future research to better understand the best manner in which to convey food allergen information to food allergy stakeholders (Barnett, Leftwich, et al., 2011; Barnett, Muncer, et al., 2011;Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Crevel et al., 2008; Miles et al., 2006; Sakellariou et al., 2010; Taylor & Hefle, 2001; Voordouw et al., 2012). By examining the Product Label Claim individually and the combined effect of the Product Label Claim and

Nutrition Facts Panel, this researcher sought to better understand food allergy stakeholder usage of consumer packaged food labels and identification of allergens based on food product labels that adhere to current FALCPA requirements. Further, this researcher sought to provide more insight into how these stakeholders evaluate allergen information. In doing so, marketers will be assisted to understand the best way to effectively communicate with food allergy stakeholders in a truthful and positive fashion.

This research has implications for stakeholders including consumers, businesses, public health policies, and governmental organizations. From the consumer perspective, life-and-death consequences may result due to the food allergy stakeholders' selection and food allergic consumers' consumption of a food product based on Product Label Claim and Nutrition Facts Panel information, or any combination thereof.

Organizations may benefit, and ultimately increase market share and profitability, by targeting products and product packaging designed for allergy afflicted consumers. In fact, in a 2002 study conducted in Austria, Spain, and the Netherlands, researchers indentified three factors that were of particular importance to food allergic consumers: the price of the food product, the taste of the food product, and the safety with regard to the ingredients contained within the food product (Miles et al., 2005). Furthermore, based on the current researcher's understanding and interpretation of studies pertaining to individuals with food allergy, it is reasonable to suppose manufacturers that are not specifically targeting allergic consumers can likely increase market share by implementing a uniform policy of truthful product ingredient and allergen disclosures on all food products.

For business organizations, irrespective of FDA and FALCPA guidelines, organizations also expose themselves to risk management issues and costly litigation as a result of patently

false, misleading, or inconspicuous Product Label Claim or Nutrition Facts Panel information that may lead to the injury or death of a food allergic consumer. Public policies and governmental organizations such as the Food and Drug Administration will find this research of importance for consumer protection and improving the quality of life for food allergic consumers.

These conclusions are supported by a European research study conducted through the Institute of Food Research. Miles et al. (2006) found information and knowledge deficiencies across allergy conscious stakeholders and end-users. Findings indicated allergic consumers required additional information that explained causes and signs of food allergy and industrial and commercial guidelines to improve labeling practices. Consumers also desired increased awareness among regulators to ensure implementation of cogent and effective policies for the safety and improved quality of life for allergic consumers and vested stakeholders (Miles et al., 2006).

To provide additional knowledge in an under-researched field of study, this research contributed to a new foundation for understanding food allergy stakeholders, their use of product packaging information, attitude certainty of product safety, overall attitude certainty, perception of milk/dairy, perceived credibility in claim, trust in nutrition information, trust in brand and label, and purchase intention of consumer packaged food products. With evaluation of food allergy stakeholders and understanding of the needs of these consumers from a marketing perspective, new advances are likely to be made in academia, public policy, and business. Ultimately, the goal of this study was to understand current challenges food allergy stakeholders face with food product ingredient information and to offer suggestions to increase their safety through nonmisleading, effective, and clear conveyance of food allergen information.

Understanding and implementation of these findings are likely to improve the quality of life for these allergy afflicted individuals.

CHAPTER III

METHODOLOGY

This chapter details the methodology used in this research study. Through an examination of the congruency of the Product Label Claim and Nutrition Facts Panel information under different levels of elaboration based on the Elaboration Likelihood Model, this study tested how these different conditions affected food allergic consumer and food allergy stakeholder attitude certainty of product safety, overall attitude certainty, perception of dairy/milk, credibility of claim, trust in nutrition information, trust in brand and label, and purchase intention. Because food allergic stakeholders use product package information to assess if a product is safe to consume, but the marketplace contains consumer packaged food products that contain conflicting allergen disclosure information on the Nutrition Facts Panel and product label, the effect of allergen disclosure incongruencies was investigated.

This study was conducted similarly to Garretson and Burton's (2000) study of perceptions of health claims to extend their research for understanding ~~of~~ the impact of congruency, or lack thereof, between Product Label Claim and Nutrition Facts Panel information with food allergy stakeholders.

Description of Study

In this study a, 2 (congruence: congruent vs. incongruent) x 2 (elaboration: high vs. low) between-subjects research design was used to test the hypotheses. Four questionnaires were employed. These were used to manipulate the degree of congruence of allergenic ingredient information between Product Label Claim (which includes all package information not contained in the Nutrition Facts Panel) and the Nutrition Facts Panel information (frequently located on the rear portion of the product packaging).

Figures A5 through A8 (Appendix A) illustrate similarly designed mock product labels derived from actual products currently in the marketplace so as to enhance the realism of the manipulations. Figure A9 (Appendix A) depicts the actual comparison of the two products and their labels found in the marketplace and the researcher-designed mock label used in this study. The utilized mock label layout is a blend of both the O'Soy yogurt label and the Great Value non-dairy creamer label. The mock manufacturer's name, product name, flavor, and actual product descriptions were derived from the O'Soy yogurt label. Mock label color selection, "non-dairy" disclaimer, and general graphical presentation of the product labels were derived from the Great Value non-dairy creamer. Pictures were intentionally not included and mock label graphic design elements were kept to a minimum to limit extraneous variables.

The front of each package, the Product Label Claim, is identical for each of the four surveys. The Product Label Claim can be found in Figures A5 through A9 (Appendix A). With the use of actual product examples, each of the Product Label Claims contained the following: (a) the inclusion of the term "non-dairy" on the front of

the package, (b) the product brand name "Oh Soy," and (c) the insertion of the statement "Organic Soy Yogurt."

The back of each package, depicting the Nutrition Facts Panel, is different for each of the four surveys. Despite their differences, each Nutrition Facts Panel is based upon the color scheme of the Great Value non-dairy creamer with an ingredients listing similar to that of the O'Soy yogurt, thereby creating realism compared to actual marketplace examples. The four Nutrition Facts Panel differences detailed below were based on U.S. FDA allergen labeling guidelines in effect at the time this study was conducted. Figure A10 depicts the comparisons between two example Nutrition Facts Panels illustrated by the FDA and the researcher's mock Nutrition Facts Panels. As with the Product Label Claim, the researcher intentionally kept design elements to a minimum for the design of the mock Nutrition Facts Panels to limit extraneous variables.

Figure A5 (Appendix A) illustrates the congruent, high elaboration manipulation. Congruence of front and back of product label are communicated with the Nutrition Facts Panel being congruent to the front label and thus not identifying dairy in the ingredients list. For high elaboration, an overt statement is not shown identifying the absence of dairy. The ingredients list needed to be fully read to determine that a dairy ingredient was not present in the product.

Figure A6 (Appendix A) illustrates the incongruent, high elaboration manipulation. Here, the Nutrition Facts Panel identifies dairy in the ingredients list and is thus incongruent with the product label. However, the list does not contain an overt statement identifying the presence of dairy. The ingredients list needed to be fully read to determine the presence of a dairy ingredient.

Figure A7 (Appendix A) illustrates the congruent, low elaboration manipulation. Here, the Nutrition Facts Panel did not identify dairy in the ingredients list but did contain an overt statement identifying the absence of dairy. The ingredients list did not need to be fully read to determine that a dairy ingredient was not present.

Figure A8 illustrates the incongruent, low elaboration manipulation. Here, the Nutrition Facts Panel is incongruent with the front label and contains an overt statement identifying the presence of dairy. The ingredients list did not need to be fully read to determine the presence of a dairy ingredient.

Both the congruent and incongruent Product Label Claims were designed using actual product information from the "organic soy yogurt" product found in Figure A1 (Appendix A), the "non-dairy" coffee creamer found in Figure A2 (Appendix A), and a side-by-side comparison of the soy yogurt and the non-dairy coffee creamer with the mock label used in this study. The soy yogurt and the non-dairy coffee creamer products were used in this research because of the misleading claims made by the brands, since each of the products imply or state they are non-dairy when they do in fact contain dairy. The Product Label Claims remain consistent throughout the study for every survey. The identification of dairy, or the lack thereof, within the Nutrition Facts Panel is the determinant of the Product Label Claim being congruent or incongruent. Stated differently, the Product Label Claim is static and the Nutrition Facts Panel information is dynamic, thereby creating a congruency/incongruency when compared the Product Label Claim.

All subjects were first exposed to the same front of package information for a yogurt product, the Product Label Claim. This initial exposure was important because the

front of the package is the first piece of product information the consumer frequently encounters. Subjects were then presented with questions about their initial purchase intention, initial attitude towards the product safety, and initial overall attitude certainty. Six separate questions (questions 9 through 13) in all surveys (Appendices C-F) captured this information, each of which required the subjects to rank responses on one or more 7-point Likert scales.

Next, subjects were presented with both the information found on the front of the package (Product Label Claim) and the Nutrition Facts Panel. They were then asked a series of questions to determine their use of product packaging information including attitude certainty of product, overall attitude certainty, perception of dairy/milk, perceived credibility in claim, trust in nutrition information, trust in brand and label, purchase intention, and changes in purchase intention of consumer packaged food products. Twenty-four separate questions (questions 16 through 42) on all four surveys (Appendices C-F) captured this information, each of which required the subjects to rank responses on one or more 7-point Likert scales.

Each subject was then asked a series of questions including demographic questions, allergy-based knowledge questions, and personal allergy questions (Lavrakas, 2008; Lietz, 2010). To eliminate error due to sample size, a minimum of 10 subjects per construct being measured is suggested (Nunnally, 1978). Based on this suggestion, data were collected from 223 respondents to exceed the minimum required sample size of 100, based on 10 constructs being measured in this study. Table 1 depicts the four questionnaire types and number of subjects who completed each type.

Table 1

Survey Matrix

25% of Subjects Receive	Number of Subjects	Questionnaire Description
Survey 1	55	Congruent: High Elaboration
Survey 2	56	Incongruent: High Elaboration
Survey 3	56	Congruent: Low Elaboration
Survey 4	56	Incongruent: Low Elaboration

Data Collection

An online questionnaire was disseminated by Qualtrics Labs to self-identified food allergic consumers or caretakers/stakeholders of a food allergic person(s) in the United States. Three qualifying questions were asked to verify that each of the respondents were a food allergic consumer or food allergic caretaker/stakeholder. Specifically, respondents were asked (a) if they had made food purchases for someone afflicted by a food allergy, (b) to identify the relationship of the food allergic person, and (c) to identify the food allergy of the afflicted food allergic person.

Appendices C, D, E, and F, questions 1, 2, and 55 display the full versions of each question in the surveys. Data from respondents that took less than 6 minutes or more than

60 minutes to complete the questionnaire were assumed to be not reasonable. These were excluded from the analysis, resulting in nine surveys not included.

Variable Measurements/Procedures

Table 2 depicts scale items used in this study. Unless otherwise noted, all original scales used were based on the 7- point Likert scale. To measure attitude certainty of product safety, scale measures were selected from Rucker and Petty's (2006) research. The reliability of these scaled measures was not reported. A sample scale item is as follows: "Please tell us your attitude regarding the safety of eating this product if you were avoiding milk/dairy ingredients on the following scale: Bad (1) - Good (7)."

To measure overall attitude certainty, scale measures were selected from Rucker and Petty's (2006) research. The reliability of these scaled measures was not reported. The final scale item is as follows: "How convinced are you that your (overall) attitude toward this product is correct? Not at all Convinced (1) - Very Convinced (7)."

To measure credibility of claim, scale measures were selected from Putrevu and Lord's (1994) and Kent and Allen's (1994) research. Putrevu and Lord's scales had a reported Cronbach's alpha of .81. Kent and Allen's scales had a reported Cronbach's alpha of .85. A sample scale item is as follows: "I felt that the claims located on the product label were: Not plausible (1) - Plausible (7)."

To measure trust in nutrition information, a scale measure was selected from Garretson and Burton's (2000) research. The reliability of these scaled measures was not reported. The final scale item is as follows: "I trust the ingredient information shown in the Nutrition Facts Panel on the back of the package: Strongly Disagree (1) - Strongly Agree (7)."

Table 2

Constructs and Scale Items

Construct	Source	Scale Item(s)
Attitude Certainty of Product Safety	Rucker & Petty, 2006	Please tell us your attitude regarding the safety of eating this product if you were avoiding milk/dairy ingredients on the following scales: Bad (1) - Good (7) Negative (1) - Positive (7) Unfavorable (1) - Favorable (7)
	Rucker & Petty, 2006	(Overall) How certain are you of your attitude toward this product? Not at all Certain (1) - Very Certain (7)
Overall Attitude Certainty	Rucker & Petty, 2006	How convinced are you that your (overall) attitude toward this product is correct? Not at all Convinced (1) - Very Convinced (7)
Perception of Dairy/Milk	N/A	How likely is it that this product contains dairy/milk ingredients: 1 (Unlikely) - 7 (Likely)
Credibility of Claim	Putrevu & Lord, 1994	Disagree (1) - Agree (7) 1. The claims on the product label are true 2. I believe in the claims on the product label 3.The product label is sincere 4. I think the product label is dishonest
	Kent & Allen, 1994	I felt that the claims located on the product label were: Not plausible (1) - Plausible (7) Not Credible (1) - Credible (7) Did Not Make Sense (1) - Did Make Sense (7)

(continued)

Construct	Source	Scale Item(s)
Trust in Nutrition Information	Garretson & Burton, 2000	I trust the ingredient information shown in the Nutrition Facts Panel on the back of the package Strongly Disagree (1) - Strongly Agree (7)
Trust in Brand and Label	Roe, Levy, & Derby, 1999	I trust the ingredient information shown on the front of this package Strongly Disagree (1) - Strongly Agree (7)
	Kirmani, 1997	The manufacturer of the product is _____. Untrustworthy (1) - Trustworthy (7) Incompetent (1) - Competent (7) Dishonest (1) - Honest (7)
Purchase Intention	N/A	How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients? Unlikely (1) - Likely (7) Uncertain (1) - Certain (7) Definitely Would Not (1) - Definitely Would (7)

To measure trust in brand and label, scale measures were selected from the research of Roe et al. (1999) and Kirmani (1997) research. Reliability for the Roe et al. scale was not reported but Kirmani's scale had a reported Cronbach's alpha of .79. A sample scale item is as follows: “I trust the ingredient information shown on the front of this package: Strongly Disagree (1) - Strongly Agree (7)."

To measure perception of dairy/milk, the researcher used the following basic scale item: "How likely is it that this product contains dairy/milk ingredients: 1 (Unlikely) - 7 (Likely)." This scale item was not derived from or altered from another source. Additionally, to measure purchase intention, the researcher used the following scale item:

"How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients? Unlikely (1) - Likely (7)" and recorded responses with a total of three 7-point, Likert scales. This scale item was not derived from or altered from another source.

Pretest

The purpose of the pretest was to make certain the questionnaires were clear, to highlight any difficulties with specific instructions or questions within the study, and to ensure that the manipulations of congruence and elaboration worked as expected. The four manipulations of congruence and elaboration were designed using existing FDA nutrition guidelines depicted in Figure A3 (Appendix A). The four manipulations were congruent high elaboration, incongruent elaboration, congruent low elaboration, and incongruent low elaboration. In addition to adherence of FDA nutrition guidelines, the researcher incorporated design cues from existing products found in the marketplace, as illustrated in Figures A3 and A4 (Appendix A)for example products. In total, the questionnaires were pretested with 26 respondents.

For the manipulation of congruency, subjects were asked three manipulation check items after viewing the product label and Nutrition Facts Panel. Using a 7-point scale of 1-7 (e.g., *incongruent* to *congruent; not expected* to *expected; not consistent* to *consistent*), subjects indicated the extent they felt the information located on the product label and the Nutrition Facts Panel was congruent/incongruent, expected/not expected, and consistent/inconsistent. As expected, subjects presented with the congruent condition, were more likely to view the information as congruent (M = 4.618) than subjects in the incongruent condition (M = 5.475).

To test for elaboration, subjects indicated the extent they felt the information located on the product label and the Nutrition Facts Panel was easily identified/not easily identified. As expected, subjects presented with the high elaboration condition were more likely to view the information as not as easily identified (M = 5.585) than subjects presented with the low elaboration condition (M = 3.55). Overall, the pretest did not highlight any issues with survey administration regarding question clarity and suggests that the manipulations worked as expected.

CHAPTER IV

DATA ANALYSES AND RESULTS

This chapter discusses and presents the findings from data analyses using analysis of variance (ANOVA), analysis of covariance (ANCOVA), *t* tests, multiple regression, and step-wise regression to test the hypotheses in this study. All findings are reported from the main study.

Demographic and Allergen Profile of Respondents

The questionnaire contained basic demographic questions for subjects. The demographic questions asked age, gender, ethnicity/race, employment, marital status, number of children, and level of education. In addition to these basic demographic questions, the questionnaire collected allergen related data from the respondents. The demographic information is summarized in Table 3.

Of the subjects that completed the survey, 84% self-reported as being food allergic and 16% reported as being a food allergy stakeholder. Furthermore, 46% of the respondents identified as either being lactose intolerant or being a stakeholder of a lactose intolerant person. A total of 26% identified as dairy allergic or a stakeholder of a dairy allergic person.

Table 3

Respondent Demographics

Sample Characteristics										
			Survey Type							
	Overall Survey		Congruent - High Elaboration		Congruent - Low Elaboration		Incongruent- High Elaboration		Incongruent - Low Elaboration	
	n	**%**	*n*	%	*n*	%	*n*	%	*n*	%
Gender										
Male	**90**	**40%**	22	40%	22	39%	23	41%	23	41%
Female	**133**	**60%**	33	60%	34	61%	33	59%	33	59%
Age										
18-24	**31**	**14%**	8	15%	5	9%	8	14%	10	18%
25-34	**72**	**32%**	19	35%	20	36%	20	36%	13	23%
35-44	**37**	**17%**	6	11%	11	20%	10	18%	10	18%
45-54	**30**	**13%**	10	18%	9	16%	3	5%	8	14%
55-64	**24**	**11%**	5	9%	6	11%	7	13%	6	11%
65-74	**23**	**10%**	6	11%	4	7%	5	9%	8	14%
75+	**6**	**3%**	1	2%	1	2%	3	5%	1	2%
Ethnicity										
White or Caucasian	**158**	**71%**	39	71%	45	80%	41	73%	33	59%
Hispanic or Latino	**18**	**8%**	6	11%	6	11%	3	5%	3	5%
Black of African American	**18**	**8%**	2	4%	4	7%	4	7%	8	14%
Native American or American Indian	**4**	**2%**	1	2%	1	2%	1	2%	1	2%
Asian or Pacific Island	**20**	**9%**	7	13%	0	0%	6	11%	7	13%
Other	**3**	**1%**	0	0%	0	0%	0	0%	3	5%
Prefer Not To Answer	**2**	**1%**	0	0%	0	0%	1	2%	1	2%

(continued)

Primary Grocery Shopper										
Yes	**198**	**89%**	47	85%	52	93%	50	89%	49	88%
No	**25**	**11%**	8	15%	4	7%	6	11%	7	13%
Food Allergic										
Self	**188**	**84%**	47	85%	42	75%	48	86%	51	91%
Other	**35**	**16%**	8	15%	14	25%	8	14%	5	9%
Accidental Food Allergen Purchase										
Yes	**156**	**70%**	34	62%	37	66%	44	79%	41	73%
No	**67**	**30%**	21	38%	19	34%	12	21%	15	27%
Other Allergen Information										
Lactose Intolerant	**102**	**46%**	24	44%	30	54%	21	38%	27	48%
Dairy Allergic	**59**	**26%**	20	36%	10	18%	14	25%	15	27%
Intolerant and/or Allergic	**129**	**58%**	35	64%	35	63%	29	52%	30	54%

Additionally, 89% self-reported as the primary grocery shopper in their households. Interestingly, not only were nearly 90% of respondents primary grocery shoppers, but 70% reported having purchased a food product with the intent of avoiding a particular allergen, only to find that upon further inspection at home the product contained a food allergen they were specifically trying to avoid. Almost three-quarters of the respondents, 84% of which had an allergy and were food allergic, accidentally purchased a food product that contained an allergen they were trying to avoid.

Statistical Analysis and Data Processing

Inferential statistics were used to analyze the survey response data. SPSS, version 18, was used for analysis of variance (ANOVA), analysis of covariance (ANCOVA), *t*

tests, multiple regression, and stepwise regression to test the hypothesized relationships in this study. Table 4 depicts each hypothesized relationship and the corresponding method of statistical analysis used in this study.

Analysis of covariance (ANCOVA) was used to test for both the main effect(s) and the interactive effect(s) upon the dependent variable for H1a-H6b. Using ANCOVA helped to control for covariates which may have covaried with the dependent variable. ANCOVA was used to statistically test both the effects of congruency and elaboration of product package allergen information. For H8 through H10, *t* tests were used to determine the significance of mean scores between the initial product exposure of the front of label and the effect of both the front of label and the Nutrition Facts Panel. Lastly, multiple regression and stepwise multiple regression analyses were used to test for the model of best fit to better predict purchase intention.

Presentation and Explanation of Inferential Statistics Results

Factor analysis was conducted to ensure that each question loaded properly with its expected construct. Table 5 illustrates the factor loadings and shows most factor loadings well in excess of the .7 minimum threshold for research. One factor loading is in excess of the .6 minimum threshold for experimental research (Hair, Black, Babin, & Anderson, 2010; Hair, Ringle, & Sarstedt, 2011; Malhorta, 2010). These values suggest adequate factor loadings.

Table 4

Matrix of Hypotheses and Corresponding Methods of Analysis

Proposition	Method of Analysis
H1a: Attitude certainty towards the product safety will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	ANCOVA
H1b: Attitude Certainty towards the product safety will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	ANCOVA
H2a: Overall attitude certainty will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	ANCOVA
H2b: Overall attitude certainty will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	ANCOVA
H3a: Perception of milk/dairy will be higher (lower) for individuals presented with incongruent (congruent) product package allergen information.	ANCOVA
H3b: Perception of milk/dairy will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	ANCOVA
H4a: Perceived credibility of claim will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	ANCOVA
H4b: Perceived credibility of claim will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	ANCOVA
H5a: Trust in nutrition information will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	ANCOVA
H5b: Trust in nutrition information will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	ANCOVA

(continued)

Proposition	Method of Analysis
H6a: Trust in brand and label will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	ANCOVA
H6b: Trust in brand and label will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	ANCOVA
H7a: Purchase intention is higher (lower) with congruent (incongruent) product package allergen information.	ANCOVA
H7b: Purchase intention is higher (lower) with low (high) elaboration product package allergen information.	ANCOVA
H8: Access to congruent (incongruent) product package allergen information increases (decreases) purchase intention as compared to just seeing the product label alone.	*t* test
H9: Access to congruent (incongruent) product package allergen information increases (decreases) attitude certainty of product safety as compared to just seeing the product label alone.	*t* test
H10: Access to congruent (incongruent) product package allergen information increases (decreases) overall attitude certainty as compared to just seeing the product label alone.	*t* test

Table 5

Factor Loadings

Constructs/ Variables	ACPS	OAC	POD/M	CC	TNI	TBL	PI
ACPS-1	**0.928**	-	-	-	-	-	-
ACPS-2	**0.934**	-	-	-	-	-	-
ACPS-3	**0.921**	-	-	-	-	-	-
ACPS-4	**0.951**	-	-	-	-	-	-
ACPS-5	**0.749**	-	-	-	-	-	-
ACPS-6	**0.935**	-	-	-	-	-	-
ACPS-7	**0.950**	-	-	-	-	-	-
ACPS-8	**0.925**	-	-	-	-	-	-
ACPS-9	**0.901**	-	-	-	-	-	-
ACPS-10	**0.704**	-	-	-	-	-	-
OAC	-	***0.614***	-	-	-	-	-
POD/M	-	-	**0.715**	-	-	-	-
CC-1	-	-	-	**0.862**	-	-	-
CC-2	-	-	-	**0.889**	-	-	-
CC-3	-	-	-	**0.876**	-	-	-
CC-4	-	-	-	**0.886**	-	-	-
CC-5	-	-	-	**0.864**	-	-	-
CC-6	-	-	-	**0.861**	-	-	-
TNI	-	-	-	-	**0.869**	-	-
TBL-1	-	-	-	-	-	**0.890**	-
TBL-2	-	-	-	-	-	**0.952**	-
TBL-3	-	-	-	-	-	**0.939**	-
TBL-4	-	-	-	-	-	**0.947**	-
PI-FL1	-	-	-	-	-	-	**0.903**
PI-FL2	-	-	-	-	-	-	**0.832**
PI-FL3	-	-	-	-	-	-	**0.910**
PI-BL1	-	-	-	-	-	-	**0.928**
PI-BL2	-	-	-	-	-	-	**0.887**
PI-BL3	-	-	-	-	-	-	**0.925**

Note: ACPS = Attitude Certainty of Product Safety; OAC = Overall Attitude Certainty; POD/M = Perception of Dairy/Milk; CC = Credibility of Claim; TNI = Trust in Nutrition Information; TBL = Trust in Brand and Label; PI = Purchase Intention.

Reliability

Partial Least Squares Path Modeling (PLSPM) using XLSTAT, version 2015.06.01, by Addinsoft, Inc., was selected for conducting the measurement model assessment. Table 6 depicts Cronbach's alpha measures well in excess of the .7 minimum threshold for each of the constructs, thereby confirming the measurement model's reliability(Hair et al. 2010; Malhorta, 2010). Further buttressing reliability was the Dillon-Goldstein Rho index, of which all constructs were in excess of the .7 minimum threshold (Chin, 1998). The Eigen Values for each of the constructs were significant, with values in excess of 1(Hair et al., 2010; Malhorta, 2010)**.**

Validity

As with reliability, Partial Least Squares Path Modeling (PLS PM) using XLSTAT version 2015.06.01 by Addinsoft, Inc. was selected for conducting the measurement model assessment for discriminant validity. Discriminant validity tests determine the degree to which measurement variables are not related ((Hair et al., 2010; Malhorta, 2010). Once such measure to test for discriminant validity is through mean communalities using squared correlations, or Average Variance Extracted (AVE) (Hair et al., 2010; Malhorta, 2010). Discriminant validity is established when AVE scores are in excess of the .5 minimum standard (Hair et al., 2010; Malhorta, 2010). As can be seen in Table 7, strong discriminant validity was found to exist, with scores well in excess of the 0.5 minimum standard.

Table 6

Composite Reliability

Latent Variable	Dimensions	Cronbach's Alpha	D.G. rho (PCA)	Condition Number	Critical Value	Eigen Values
ACPS	10	0.973	0.977	16.142	1.000	8.102 0.621 0.453 0.357 0.169 0.100 0.070 0.056 0.041 0.031
OAC	1	N/A	N/A	N/A	N/A	N/A
POD/M	1	N/A	N/A	N/A	N/A	N/A
CC	6	0.961	0.968	7.638	1.000	5.019 0.445 0.184 0.143 0.124 0.086
TNI	1	N/A	N/A	N/A	N/A	N/A
TBL	4	0.968	0.977	8.915	1.000	3.651 0.201 0.102 0.046
Congruency	1	N/A	N/A	N/A	N/A	N/A
PI	3	0.935	0.959	7.943	1.000	2.660 0.298 0.042

Note. ACPS = Attitude Certainty of Product Safety; OAC = Overall Attitude Certainty; POD/M = Perception of Dairy/Milk; CC = Credibility of Claim; TNI = Trust in Nutrition Information; TBL = Trust in Brand and Label; PI = Purchase Intention.

Table 7

Discriminant Validity

	ACPS	OAC	POD/M	CC	TNI	TBL	Congruency	PI	Mean Communali-ties (AVE)
ACPS	**1**	0.390	0.178	0.713	0.176	0.672	0.210	0.607	0.810
OAC	0.390	**1**	0.053	0.298	0.149	0.281	0.055	0.231	
POD/M	0.178	0.053	**1**	0.255	0.042	0.251	0.171	0.114	
CC	0.713	0.298	0.255	**1**	0.255	0.871	0.227	0.621	0.836
TNI	0.176	0.149	0.042	0.255	**1**	0.260	0.031	0.143	
TBL	0.672	0.281	0.251	0.871	0.260	**1**	0.196	0.690	0.913
Congruency	0.210	0.055	0.171	0.227	0.031	0.196	**1**	0.184	
PI	0.607	0.231	0.114	0.621	0.143	0.690	0.184	**1**	0.887
Mean Communalities (AVE)	0.810			0.836		0.913		0.887	**0**

Note. ACPS = Attitude Certainty of Product Safety; OAC = Overall Attitude Certainty; POD/M = Perception of Dairy/Milk; CC = Credibility of Claim; TNI = Trust in Nutrition Information; TBL = Trust in Brand and Label; PI = Purchase Intention.

Manipulation Checks

Manipulation checks were conducted to determine the level of significance of both the congruence manipulation and the elaboration manipulation. Consistent with the pretest manipulation check, congruence of the allergen message was determined to be statistically significant. However, unlike the findings from the pretest manipulation check, elaboration was not found to be statistically significant. Tables 8, 9, 10, and 11 display the manipulation checks in more detail.

Table 8

Manipulation Check: Congruency—Group Statistics

Congruent vs. Incongruent		*n*	Mean	Std. Deviation	Std. Error Mean
Congruent	.0	111	3.018	1.776	0.169
Incongruent	1.0	112	4.976	2.132	0.201

Table 9

Manipulation Check: Congruency—Independent Samples

		Levene's Test for Equality of Variances		*t* test for Equality of Means						
		F	Sig.	*t*	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Congruence Manipulation Check	Equal variances assumed	7.507	.007	-7.449	221	.000	-1.958	0.263	-2.476	-1.440
	Equal variances not assumed			-7.455	214.685	.000	-1.958	0.263	-2.476	-1.440

As depicted in Tables 8 and 9 above, congruency of the allergen message was strongly supported with a congruent message $M = 3.018$, $SD = 1.776$, versus an incongruent message, $M = 4.976$, $SD = 2.132$, $t(221) = -7.449$, $p = .007$) (Hair et al., 2010; Kachigan, 1986; Malhorta, 2010).

Table 10

Manipulation Check: Elaboration—Group Statistics

Low Elaboration vs. High Elaboration		*n*	Mean	Std. Deviation	Std. Error Mean
Low Elaboration	.0	112	3.533	2.089	0.197
High Elaboration	1.0	111	3.700	2.048	0.194

Table 11: Manipulation Check: Elaboration—Independent Samples

		Levene's Test for Equality of Variances		*t* test for Equality of Means						
		F	Sig.	*t*	*df*	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Elaboration Manipulation Check	Equal variances assumed	.001	.970	-.603	221	.547	-0.167	0.277	-0.713	0.379
	Equal variances not assumed			-.603	220.975	.547	-0.167	0.277	-0.713	0.379

As depicted in Tables 10 and 11 above, elaboration of the allergen message was not supported with a low elaboration message, $M = 3.533$, $SD = 2.089$, versus a high elaboration message, $M = 3.700$, $SD = 2.048$, $t(221) = -0.603$, $p = .970$) (Hair et al., 2010; Kachigan, 1986; Malhorta, 2010).

Descriptive Statistics

The survey completion times were reviewed, and it was found that the incongruent-high elaboration survey took the longest time to complete, with a mean survey length of 10.38 minutes and median duration time of 8.87 minutes. In contrast, respondents for the three other survey types (incongruent-low elaboration, congruent-high elaboration, and congruent-low elaboration) took a mean of 9.56 minutes and a median duration of 8.74 minutes. These findings lent support for the success of the manipulations, as further described in Chapter V.

Hypotheses Tests

The first tests were those for the effects that congruence had on the dependent variables (DVs) for H1a-H6a and the effects that elaboration had on the DVs for H1b-H6b. Analysis of covariance (ANCOVA) was used to test for both the main effect(s) and the interactive effect(s). The congruence hypotheses are individually presented below, followed by the elaboration hypotheses.

Congruence Hypotheses

To test H1a, that attitude towards product safety will be higher when subjects are presented congruent allergen information, as compared to subjects presented with incongruent allergen information, an ANCOVA was run. The results showed a significant difference between the groups. As expected, those shown congruent information had a significantly higher (p = .000) attitude towards product safety (M = 5.69) than those shown incongruent information (M = 4.14). H1a was therefore supported.

When congruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked increase in attitude regarding the safety of the product if they were avoiding a particular allergen. Conversely, when incongruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked decrease in attitude regarding the safety of the product if they were avoiding a particular allergen. Therefore, food allergen information congruency between the front of the product label and the Nutrition Facts Panel had a significant impact on attitude certainty of product safety.

To test H2a, that overall attitude certainty will be higher when subjects are presented with congruent allergen information, as compared to subjects presented with incongruent allergen information, an ANCOVA was run. The results showed a significant difference between the groups. As expected, those shown congruent information had a significantly higher (p = .000) overall attitude certainty (M = 5.79) than those shown incongruent information (M = 4.98). H2a was therefore supported.

When congruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked increase in overall attitude certainty if they were avoiding a particular allergen. Conversely, when incongruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked decrease in overall attitude certainty if they were avoiding a particular allergen. Therefore, food allergen information congruency between the front of the product label and the Nutrition Facts Panel had a significant impact on overall attitude certainty.

To test H3a, that perception of milk/dairy will be higher when subjects are presented with incongruent allergen information, as compared to subjects presented with congruent allergen information, an ANCOVA was run. The results showed a significant difference between the groups. As expected, those shown incongruent information had a significantly higher (p = .000) perception of milk/dairy (M = 5.13) than those shown congruent information (M = 3.18). H3a was therefore supported.

When congruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked increase in perception of milk/dairy if they were avoiding the milk/dairy allergen. Conversely, when incongruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked decrease in perception of milk/dairy if they were avoiding the milk/dairy allergen. Therefore, food allergen information congruency between the front of the product label and the Nutrition Facts Panel had a significant impact on perception of milk/dairy.

To test H4a, that perceived credibility of claim will be higher when subjects are presented with congruent allergen information, as compared to subjects presented with incongruent allergen information, an ANCOVA was run. The results showed a significant difference between the groups. As expected, those shown congruent information had a significantly higher (p = .000) perceived credibility of claim (M = 5.7) than those shown incongruent information (M = 3.91). H4a was therefore supported.

When congruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked increase in perceived credibility of claim if they were avoiding a particular allergen.

Conversely, when incongruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked decrease in perceived credibility of claim if they were avoiding a particular allergen. Therefore, food allergen information congruency between the front of the product label and the Nutrition Facts Panel had a significant impact on perceived credibility of claim.

To test H5a, that trust in nutrition information will be higher when subjects are presented with congruent allergen information, as compared to subjects presented with incongruent allergen information, an ANCOVA was run. The results showed a significant difference between the groups. As expected, those shown congruent information had a significantly higher (p = .008) trust in nutrition information (M = 5.76) than those shown incongruent information (M = 5.17). H5a was therefore supported.

When congruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked increase in trust in nutrition information if they were avoiding a particular allergen. Conversely, when incongruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked decrease in trust in nutrition information if they were avoiding a particular allergen. Therefore, food allergen information congruency between the front of the product label and the Nutrition Facts Panel had a significant impact on trust in nutrition information.

To test H6a, that trust in brand and label will be higher when subjects are presented with congruent allergen information, as compared to subjects presented with incongruent allergen information, an ANCOVA was run. The results showed a significant difference between the groups. As expected, those shown congruent information had a

significantly higher (p = .000) trust in brand and label (M = 5.44) than those shown incongruent information (M = 3.68). H6a was therefore supported.

When congruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked increase in trust in brand and label if they were avoiding a particular allergen. Conversely, when incongruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked decrease in trust in brand and label if they were avoiding a particular allergen. Therefore, food allergen information congruency between the front of the product label and the Nutrition Facts Panel had a significant impact on trust in brand and label.

To test H7a, that purchase intention will be higher when subjects are presented with congruent allergen information as compared to subjects presented with incongruent allergen information, an ANCOVA was run. The results showed a significant difference between the groups. As expected, those shown congruent information had a significantly higher (p = .000) purchase intention (M = 5.20) than those shown incongruent information (M = 3.39). H7a was therefore supported.

When congruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked increase in purchase intention if they were avoiding a particular allergen. Conversely, when incongruent food allergen information was presented on the front of the product label and in the Nutrition Facts Panel, food allergy stakeholders had a marked decrease in purchase intention if they were avoiding a particular allergen. Therefore, food allergen

information congruency between the front of the product label and the Nutrition Facts Panel had a significant impact on purchase intention.

Elaboration Hypotheses

As noted, the manipulation check for elaboration indicated the difference between the groups was not significant. However, the manipulation check was significant in the pilot study, and the time reported to complete the study indicated that the survey took longer under the high elaboration condition. These findings also suggested that there may be some differences in specific variables. Thus Hypotheses 1b through 6b were tested and are reported; however, inferences were not drawn. The amount of elaboration used in the study was consistent with FDA labeling guidelines for elaboration, and additional research in this area should be conducted. The results of these individual variables are presented below.

To examine H1b, that attitude towards product safety will be higher when subjects are presented allergen information under low elaboration, as compared to subjects presented allergen information under high elaboration, an ANCOVA was run. No significant difference was shown between the groups. The low elaboration mean was not significantly higher (p = .242) for the attitude towards product safety (M = 4.77) than the mean for those in the high elaboration condition (M = 5.05).

To examine H2b, that overall attitude certainty will be higher when subjects are presented allergen information under low elaboration, as compared to subjects presented allergen information under high elaboration, an ANCOVA was run. A significant difference was shown between the groups. The low elaboration mean was significantly

lower (p = .015) for the overall attitude certainty (M = 5.09) than the mean for those in the high elaboration condition (M = 5.65). This finding was statistically significant, and H2b was therefore supported.

To examine H3b, that perception of milk/dairy will be higher when subjects are presented allergen information under low elaboration, as compared to subjects presented allergen information under high elaboration, an ANCOVA was run. A significant difference was not shown between the groups. The low elaboration mean was not significantly higher (p = .943) for the perception of milk/dairy (M = 4.15) than the mean for those in the high elaboration condition (M = 4.17).

To examine H4b, that perceived credibility of claim will be higher when subjects are presented allergen information under low elaboration, as compared to subjects presented allergen information under high elaboration, an ANCOVA was run. A significant difference was not shown between the groups. The low elaboration mean was not significantly higher (p = .890) for the perceived credibility of claim (M = 4.82) than the mean for those in the high elaboration condition (M = 4.78).

To examine H5b, that trust in nutrition information will be higher when subjects are presented allergen information under low elaboration, as compared to subjects presented allergen information under high elaboration, an ANCOVA was run. A significant difference was found between the groups. The low elaboration mean was significantly lower (p = .041) for the trust in nutrition information (M = 5.23) than the mean for those in the high elaboration condition (M = 5.69). This finding was statistically significant, and H5b was therefore supported.

To examine H6b, that trust in brand and label will be higher when subjects are presented allergen information under low elaboration, as compared to subjects presented allergen information under high elaboration, an ANCOVA was run. No significant difference was found between the groups. The low elaboration mean was not significantly higher (p = .853) for the trust in brand and label (M = 4.58) than the mean for those in the high elaboration condition (M = 4.53).

To examine H7b, that purchase intention will be higher when subjects are presented allergen information under low elaboration, as compared to subjects presented allergen information under high elaboration, an ANCOVA was run. No significant difference was shown between the groups. The low elaboration mean was not significantly higher (p = .992) for the purchase intention (M = 4.29) than the mean for those in the high elaboration condition (M = 4.29).

Presentation of Findings for Hypotheses H1a, H1b Through H7a, H7b

Table 12 presents the summary findings for Hypotheses H1a, H1b through Hypotheses H7a, H7b. These findings resulted from the ANCOVA statistical analyses. A more in-depth table depicting all ANCOVA statistical findings, including means and standard deviations, can be found in Table B6 (Appendix B).

Table 12

Hypothesis Support—H1a, H1b Through H7a, H7b

Hypothesis	Variable Relationship	Mean Square	*F* Statistic	Significance	Alpha	Support
H1a	Congruence -> Attitude Towards Product Safety	134.51	52.88	0.000	0.05	**Supported**
H1b	Elaboration -> Attitude Towards Product Safety	4.31	1.37	0.242	0.05	
H2a	Congruence -> Overall Attitude Certainty	36.63	12.93	0.000	0.05	**Supported**
H2b	Elaboration -> Overall Attitude Certainty	17.56	6.01	0.015	0.05	**Supported**
H3a	Congruence -> Perception of Milk/Dairy	212.8	45.51	0.000	0.05	**Supported**
H3b	Elaboration -> Perception of Milk/Dairy	0.029	0.005	0.943	0.05	
H4a	Congruence -> Perceived Credibility of Claim	180.22	65	0.000	0.05	**Supported**
H4b	Elaboration -> Perceived Credibility of Claim	0.69	0.19	0.890	0.05	
H5a	Congruence -> Trust in Nutrition Information	19.22	7.07	0.008	0.05	**Supported**
H5b	Elaboration -> Trust in Nutrition Information	11.57	4.2	0.041	0.05	**Supported**
H6a	Congruence -> Trust in Brand and Label	173.25	53.7	0.000	0.05	**Supported**
H6b	Elaboration -> Trust in Brand and Label	0.137	0.03	0.853	0.05	
H7a	Product Package Allergen Congruence -> Purchase Intention	181.7	49.29	0.000	0.05	**Supported**
H7b	Product Package Allergen Elaboration -> Purchase Intention	0	0	0.992	0.05	

Presentation of Findings for Hypotheses H8, H9, and H10

As mentioned previously, all subjects were initially exposed to a front Product Label Claim and asked questions to determine their initial purchase intention (IPI), initial attitude certainty towards the products safety (IACPS), and initial overall attitude certainty, (IOAC). The responses provided a baseline measure of these constructs. After being exposed to both the front Product Label Claim and the Nutrition Facts Panel, subjects were again asked to complete these questions, thereby permitting the researcher to identify any changes in perception that resulted from exposure to the manipulation.

To test whether these changes were significant, a *t* test of the means (baseline versus postexposure) was conducted. H8 hypothesized that access to congruent Nutrition Facts Panel information would increase PI, as compared to a stakeholder seeing incongruent Nutrition Facts Panel information, which would decrease PI as compared to the initial exposure of only the front Product Label Claim. This hypothesis was supported: $IPI_{congruent}$ M = 4.772, SD = 1.741 vs. $PI_{congruent}$ M = 5.201, SD = 1.597, $t(221) = 7.021$, $p = .000$); $IPI_{incongruent}$ M = 4.818, SD = 1.852 vs. $PI_{incongruent}$ M = 3.396, SD = 2.194, $t(221) = 7.021$, $p = .000$. Table 13 displays the results for the group congruence, and Table 14 displays the results for the independent samples.

Table 13

H8, Initial Purchase Intention vs. Purchase Intention—Group Statistics for Congruence

Congruent vs. Incongruent		*n*	Mean	Std. Deviation	Std. Error Mean
Initial Purchase Intention	.0	111	4.772	1.741	0.165
	1.0	112	4.818	1.852	0.175
Purchase Intention	.0	111	5.201	1.597	0.152
	1.0	112	3.396	2.194	0.207

This finding is important, since it clearly demonstrates congruency between the front of label and the Nutrition Facts Panel information purchase intention when compared to initial purchase intention. Specifically, purchase intention increases in comparison to initial purchase intention when an allergen information congruency exists; purchase intention decreases when an incongruency exists. These findings suggest food allergy stakeholders will have increased purchase intention in comparison to their initial purchase intention with a congruent allergen message and will have deceased purchase intention when an incongruent allergen message is present.

Table 14

H8, Initial Purchase Intention vs. Purchase Intention— Independent Samples Test for Congruence

		Levene's Test for Equality of Variances		*t* test for Equality of Means						
		F	Sig.	*t*	*df*	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Initial Purchase Intention	Equal variances assumed	1.158	0.283	-0.194	221.000	0.846	-0.047	0.241	-0.521	0.428
	Equal variances not assumed			-0.194	220.380	0.846	-0.047	0.241	-0.521	0.428
Purchase Intention	Equal variances assumed	23.102	0.000	7.021	221.000	0.000	1.805	0.257	1.299	2.312
	Equal variances not assumed			7.031	202.904	0.000	1.805	0.257	1.299	2.312

H9 hypothesized that access to congruent Nutrition Facts Panel information would increase attitude certainty of product safety (ACPS), as compared to a stakeholder seeing incongruent Nutrition Facts Panel information, which would decrease ACPS, as compared to the initial exposure of only the front Product Label Claim. This hypothesis was supported. $IACPS_{congruent}$ M = 5.517, SD = 1.240 vs. $ACPS_{congruent}$ M = 5.755, SD = 1.160, $t(221) = 7.726$, $p = .000$); $IACPS_{incongruent}$ M = 5.525, SD = 1.391 vs. $ACPS_{incongruent}$ M = 3.976, SD = 2.133, $t(221) = 7.726$, $p = .000$. Table 15 displays the results for the group congruence, and Table 16 displays the results for the independent samples.

Table 15

H9, Initial Attitude Certainty of Product Safety vs. Attitude Certainty of Product Safety—Group Statistics for Congruence

Congruent vs. Incongruent		*n*	Mean	Std. Deviation	Std. Error Mean
Initial Attitude Certainty of Product Safety	.0	111	5.517	1.240	0.118
	1.0	112	5.525	1.391	0.131
Attitude Certainty of Product Safety	.0	111	5.755	1.160	0.110
	1.0	112	3.976	2.133	0.202

This finding is compelling, since it clearly demonstrates that congruency between the front of label and the Nutrition Facts Panel information positively impacts attitude certainty of product safety when compared to the initial exposure of only the front of the product label, initial attitude certainty of product safety. Specifically, attitude certainty of product safety increases compared to initial attitude certainty of product safety when allergen information congruency exists and decreases when an incongruency exists. Therefore, these findings suggest food allergy stakeholders will have increased attitude certainty of product safety in comparison to their initial attitude certainty of product safety with a congruent allergen message; stakeholders will have deceased attitude certainty of product safety when an incongruent allergen message is present.

Table 16

H9, Initial Attitude Certainty of Product Safety vs. Attitude Certainty of Product Safety—Independent Samples Test for Congruence

		Levene's Test for Equality of Variances		*t* test for Equality of Means						
		F	Sig.	*t*	*df*	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Initial Attitude Certainty of Product Safety	Equal variances assumed	1.642	0.201	-0.050	221.000	0.960	-0.009	0.177	-0.357	0.339
	Equal variances not assumed			-0.050	218.596	0.960	-0.009	0.176	-0.356	0.339
Attitude Certainty of Product	Equal variances assumed	63.420	0.000	7.726	221.000	0.000	1.779	0.230	1.325	2.233
Safety	Equal variances not assumed			7.745	171.700	0.000	1.779	0.230	1.326	2.232

H10 hypothesized that access to congruent nutrition facts panel information would increase overall attitude certainty (OAC), as compared to a stakeholder seeing incongruent Nutrition Facts Panel information (IOAC), which would decrease OAC as compared to the initial exposure of only the front Product Label Claim. This hypothesis was supported. $IOAC_{congruent}$ m = 5.617, SD = 1.164 vs. $OAC_{congruent}$ M = 5.811, SD = 1.152, $t(221) = 4.571$, $p = .000$; $IOAC_{incongruent}$ M = 5.442, SD = 1.562 vs. $OAC_{incongruent}$ M = 4.817, SD = 1.983, $t(221) = 4.571$, $p = .000$). Table 17 displays the result for the group congruence, and Table 18 displays the results for the independent samples.

Table 17

H10, Initial Overall Attitude Certainty vs. Overall Attitude Certainty—Group Statistics for Congruence

Congruent vs. Incongruent		*n*	Mean	Std. Deviation	Std. Error Mean
Initial Overall Attitude Certainty	.0	111	5.617	1.164	0.110
	1.0	112	5.442	1.562	0.148
Overall Attitude Certainty	.0	111	5.811	1.152	0.109
	1.0	112	4.817	1.983	0.187

Table 18

H10, Initial Overall Attitude Certainty vs. Overall Attitude Certainty—Independent Samples Test for Congruence

		Levene's Test for Equality of Variances		*t* test for Equality of Means						
		F	Sig.	*t*	*df*	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Initial Overall Attitude Certainty	Equal variances assumed	6.204	0.013	0.949	221.000	0.344	0.175	0.185	-0.189	0.539
	Equal variances not assumed			0.950	205.195	0.343	0.175	0.184	-0.188	0.539
Overall Attitude Certainty	Equal variances assumed	37.268	0.000	4.571	221.000	0.000	0.994	0.217	0.565	1.422
	Equal variances not assumed			4.581	178.588	0.000	0.994	0.217	0.566	1.422

Similar to the finding for H9, this finding is substantial since it clearly demonstrates that congruency between the front of label and the Nutrition Facts Panel information positively impacts overall attitude certainty when compared to the initial exposure of only the front of the product label, initial overall attitude certainty. Specifically, overall attitude certainty increases compared to initial overall attitude certainty when allergen information congruency exists and decreases when an incongruency exists. Therefore, these findings suggest food allergy stakeholders will have increased overall attitude certainty in comparison to their initial overall attitude certainty with a congruent allergen message and have deceased overall attitude certainty when an incongruent allergen message is present.

Next, *t* tests were conducted to test for differences between three hypotheses. These were H8 (initial purchase intention and purchase intention), H9 (initial attitude certainty of product safety and attitude certainty of product safety), and H10 (initial overall attitude certainty and overall attitude certainty). Table 19 presents the findings from the *t* test statistical analyses.

Table 19

Hypothesis Support—H8, H9, and H10

Hypothesis	Variable Relationship	Mean Square	*F* Statistic	Significance	Alpha	Support
H8	Product Package Allergen Congruence & Initial Purchase Intention vs. Purchase Intention	7.021	23	.000	.05	**Supported**
H9	Product Package Allergen Congruence & Initial Attitude Certainty of Product Safety vs. Attitude Certainty of Product Safety	7.72	63.42	.000	.05	**Supported**
H10	Product Package Allergen Congruence & Initial Overall Attitude Certainty vs. Overall Attitude Certainty	4.57	37.26	.000	.05	**Supported**

Stepwise Multiple Regression

The previous analyses established the importance of congruence on attitude towards product safety, overall attitude certainty, perception of milk/dairy, credibility of claim, trust in nutrition information, trust in brand and label, and purchase intention. Multiple regression and stepwise multiple regressions were used to better understand the relative importance of the variables on overall purchase intention among food allergic stakeholders. As can be seen in Table 20, the results of the multiple regression analysis suggested that attitude towards product safety, perception of milk, and trust in brand and label have a significant impact on purchase intention. Trust in information had a marginal impact ($p = 0.086$).

Table 20

Regression Analysis

MEDIATION TEST										
Congruent/Incongruent + Mediator H--> Purchase Intention										
Model Summary				ANOVA			Coefficients- C/I		Coefficients - Mediator	
R	*R* Squared	Adjusted *R* Squared	Durbin-Watson	*df*	*F*	Sig.	*t*	Sig.	*t*	Sig.
MULTIPLE REGRESSION										
0.854	0.729	0.723	1.850	5.000	116.972	0.000	-1.807	0.072		
							Trust in Brand and Label		10.187	0.000
							Attitude Certainty of Product Safety		4.246	0.000
							Perception of Milk /Dairy		2.974	0.003
							Trust in Nutrition Information		-1.725	0.086

(continued)

STEPWISE MULTIPLE REGRESSION										
0.849	0.721	0.717	1.810	3.000	188.779	0.000	-2.609	0.010		
							Trust in Brand		10.222	0.000
							Attitude Certainty of Product Safety		4.514	0.000
							Perception of Milk /Dairy		2.463	0.015

Next, stepwise multiple regression was used to test the impact of all the variables on purchase intention and to arrive at a model of best fit for prediction of purchase intention. Per Table 20, stepwise multiple regression included only three supported variables, listed in order of significance and predictive power. These were trust in brand, attitude towards product safety, and perception of milk/dairy, listed in order or magnitude from greatest to least. Trust in brand had the highest explanatory power *(p* = .000), *t*(10.222).

These results are important, since purchase intention is most impacted by trust in brand and label, followed by attitude towards product safety, and lastly, perception of milk/dairy. This finding is significant because trust in brand and label is the strongest determining factor in purchase intention. Furthermore, as detailed in H6a, trust in brand and label is also significantly impacted by congruency of the communicated allergen message. Therefore, these findings suggest food allergic stakeholder purchase intention is most impacted by a congruent allergen message, since trust in brand and label is significantly impacted by congruence.

CHAPTER V

SUMMARY AND DISCUSSION OF FINDINGS

The findings from this research study impact a number of facets within national and global society. Although this is one of only several research studies that specifically target U.S. food allergic consumers and food allergic stakeholders, many improvements and recommendations can be made to improve the food safety and quality of life for food allergy sufferers. Through additional research and continued refinement of public policy and improved business practices, improved food allergen disclosures on product labels are possible.

Summary

Based on the degree of inaccurate allergen labeling found on product labels in the marketplace, this study underscored the necessity for public policy improvements pertaining to food allergen labeling of consumer packaged foods. Overall, the results from this study highlight the need for congruent, clear, easily identifiable, and unambiguous food allergen labeling. The findings showed that among food allergy stakeholders, congruence of the food allergen message and the degree of elaboration required to identify allergens collectively impacted overall attitude certainty and trust in nutrition information.

Individually, congruence of the allergen message significantly impacted attitude towards product safety, overall attitude certainty, perception of milk/dairy, perceived credibility in claim, trust in nutrition information, trust in brand and label, and purchase intention. Elaboration was found to impact significantly overall attitude certainty and trust in nutrition information. When food Product Label Claims do not align with actual allergen ingredient information, the health and safety of food allergic persons are placed at risk due to the potential for accidental allergen ingestion.

This research gathered information directly from respondents who self-identified as U.S. food allergic stakeholders. Of the respondents, 89% self-reported as the primary grocery shopper in their household. Interestingly, not only were nearly 90% of respondents primary grocery shoppers. Also 70% of the subjects reported having purchased a food product with the intent of avoiding a particular allergen, only to find that, upon further inspection at home, the product contained a food allergen they were specifically trying to avoid. Almost three-quarters of the study respondents, 84% of whom had an allergy and were food allergic, accidentally purchased a food product that contained an allergen they were trying to avoid. These findings demonstrate the struggles food allergic stakeholders face in their daily shopping experiences as primary grocery shoppers. The implications are far-reaching. Theoretical, public policy, and managerial implications are extensively detailed below.

Theoretical Implications

Food Allergen Information Congruency

From a theoretical basis, this study highlighted an under-researched field of research that warrants additional investigative inquiry to study the impact of current U.S. food allergen labeling guidelines. The impact of these guidelines on food allergy sufferers and food allergic stakeholders, and suggestions for food labeling improvements, are described in this section. One such area this study highlighted is the congruency of the allergen communication message. The findings depict food allergic stakeholders' confusion among safe food selection choices when Product Label Claims do not align with actual allergen ingredient information.

Specifically, congruency between Product Label Claims contained on the front of the product label and the Nutrition Facts Panel information found on the back product label was found to be statistically significant for attitude towards product safety, overall attitude certainty, perception of milk/dairy, perceived credibility of claim, trust in nutrition information, trust in brand and label, and purchase intention. These findings emphasize the importance of food allergen information congruency found on the food product label and its impact on attitude, perception, trust, and purchase intention of food allergic stakeholders.

Taken together, these findings allow researchers to gain additional insight into the impact of congruent food product communications and their impact upon the decision making process of safe food selection by food allergic stakeholders. Stated differently, through an alignment, or congruence, of both Product Label Claims and the Nutrition Facts Panel information, this research has shown a reduction of stakeholder confusion

with congruence of Product Label Claims and the Nutrition Facts Panel information, thereby increasing the likelihood of safe and proper food selection for allergen sensitive consumers.

This research has demonstrated food allergen information congruency between the front of the product label and the Nutrition Facts Panel was found to impact significantly both attitude certainty of product safety and overall attitude certainty of U.S. food allergy stakeholders. These are important findings, since attitude certainty of product safety and overall attitude certainty among food allergic stakeholders is significantly impacted by congruency of allergen information. Conversely, if incongruency is identified, food allergic stakeholders reduced attitude certainty of both product safety and overall attitude certainty. These findings are consistent with research that has demonstrated changes in attitude certainty can be affected by a number of factors, including source credibility, effectiveness of the communicated message, and guided action made by the consumer.

The findings of this study also highlight the importance of perception of a particular allergen a food allergic stakeholder is seeking to avoid. Specifically, the findings demonstrated perception of milk/dairy by U.S. food allergy stakeholders is impacted significantly by the congruency between the Product Label Claim found on the front of the package and the Nutrition Facts Panel information commonly found on the back of the product packaging. This finding is consistent with prior research that appears to suggest food allergic consumers may utilize both Product Label Claim and Nutrition Facts Panel information during their product evaluation.

Another set of findings of this research centered on trust of the consumer with regard to message communications conveyed through the food product label. This research found the congruency between the front of the product label and the Nutrition Facts Panel significantly impacted both trust of nutrition information and trust in brand and label of U.S food allergy stakeholders. This finding is consistent with prior research that established consumer trust in manufacturer/brand name can be affected by the consumer's perception of congruency between the Product Label Claim and the Nutrition Facts Panel information.

This study also investigated the impact of purchase intention based on congruency between the front of the product label and the Nutrition Facts Panel. The findings established that purchase intention of U.S. food allergic stakeholders was impacted significantly by food allergen information congruency between the front of the product label and the Nutrition Facts Panel. Therefore, if U.S. food allergy stakeholders are confident in the claim, then they are willing to partake in the exchange relationship via purchase intention; if food allergy stakeholders are not willing to partake in the exchange relationship, then they are not confident and will likely be unwilling to purchase the food product.

An overarching finding of this study emphasized the impact of improved allergen communications through the Nutrition Facts Panel information. All respondents functioned at a heightened level of awareness because they were U.S. food allergic stakeholders, in instances where an overt allergen disclosure was made, i.e., "contains milk," respondents were more confident about their identification of allergens contained in the food product and exhibited increased likelihood to purchase the food product when

compared to instances where an overt allergen disclosure was not provided. As evidenced in the differences in survey completion times, specifically the longer length of time required to complete the incongruent high elaboration survey, respondents required more time to process the information presented in the form of a high elaboration incongruent message as compared to those presented with a message requiring lower levels of elaboration or with congruent allergen communications.

In a survey setting, time constraints and distractions are likely less of an issue compared to a respondent who is shopping under time constraints or in an environment with distractions, such as those in a grocery store or market. For instance, a food shopper looking at an incongruent high elaboration label may not have adequate time or attention to study the message. Therefore, the negative impact of making an incorrect food selection choice is actually exacerbated in the grocery store setting when compared to a survey setting. Changes in allergen disclosures, whether driven via additional public policy or through voluntary labeling disclosures by consumer packaged food producers, can help improve allergen identification on prepackaged food labels. The inclusion of an allergen statement within the Nutrition Facts Panel is, per current FDA guidelines, optional.

Food Allergen Information Elaboration

In addition to the aforementioned contributions based on the congruency of food allergen ingredient information, this research also provided insight into the impact of elaboration required to locate and identify allergens contained in the food product. This investigation of elaboration will help form a stronger foundation and theoretical

understanding of the impact among food allergic stakeholders. This statement applies specifically to the impact of a low elaboration allergen message, in which an overt allergen disclosure clearly states the allergen contained in the food product versus a high elaboration devoid of a clear allergen disclosure. The lack of a clear disclosure requires a more in-depth inquiry, or high level of elaboration, in which the food allergic stakeholder would need to exert more time and effort, such as reading every ingredient in the ingredient listing, to determine the presence of a particular food allergen.

Although attitude safety towards product safety was not found to be higher when subjects were presented with allergen information under low elaboration versus high elaboration, the findings do provide insight. Particularly, food allergy stakeholders presented with the high elaboration condition had an increased positive attitude towards product safety versus those presented with the low elaboration condition. Though the results were not in the hypothesized direction, one explanation suggests food allergic stakeholders spent more time than study participants in all surveys reviewing the information contained on the front of the product label and the Nutrition Facts Panel and therefore formed an increased level of confidence in their attitude certainty.

Responses from food allergy stakeholder perceptions of milk/dairy in the food product were nearly identical across both low and high elaboration treatments. Although the low elaboration mean was not in the hypothesized direction, consisting of a statistically higher mean for the low elaboration condition compared to the high elaboration condition, this finding is nevertheless significant. Since the majority of food allergy stakeholders in this study were primary grocery shoppers (over 90%), it can be presumed that the respondents were more versed than typical consumers in identification

of allergens in food products. Therefore, the nearly identical means between the low and high elaboration conditions in conjunction with respondents' self- identification as primary grocery shoppers suggests food allergic stakeholders are likely to perceive food allergens equally, irrespective of elaboration.

Food allergy stakeholder perceived credibility of claim and trust in brand and label was hypothesized to be higher when subjects were presented with allergen information under low elaboration versus high elaboration conditions. Interestingly, the means for both the low and high elaboration conditions were nearly identical for both perceived credibility of claim and trust in brand and label. Two explanations for this finding may be suggested: (a) Food allergic stakeholders may view both perceived credibility of claim and trust in brand and label equally, irrespective of elaboration. (b) Since the majority of food allergy stakeholders in this study were primary grocery shoppers, it can be presumed that the respondents perceived credibility of claim and trust in brand and label similarly, irrespective of elaboration.

Elaboration was found to be statistically significant for both overall attitude certainty and trust in nutrition information. These two findings emphasize the impact of elaboration for food allergy stakeholders when using product labels. The high elaboration condition required a higher degree of involvement of the food allergy stakeholder that resulted in increased overall attitude certainty and trust in nutrition information. To better understand this relationship, it is recommended that researchers further test these findings to arrive at the ideal degree of beneficial elaboration on the continuum from low elaboration and high elaboration.

However, in this study, purchase intention was also found to be elaboration-independent. The means for both the low elaboration and high elaboration conditions exhibited identical purchase intention. Although the hypothesized influence between low and high elaboration was not supported, the finding suggests food allergy stakeholders who are primary grocery shoppers do not make purchase decisions based on the degree of elaboration of the communicated allergen message. Further investigative inquiry may yield a more in-depth understanding of elaboration of the allergen message and its role, if any, with factors including but not limited to overall attitude certainty, trust in nutrition information, and purchase intention.

Food Allergic Stakeholder Purchase Intention Evolvement

In addition to rigorously testing of the impact of congruency and elaboration on a number of variables, this research investigated changes between initial purchase intention and purchase intention, initial attitude certainty of product safety and attitude certainty of produce safety, and initial overall attitude certainty and overall attitude certainty. Following from these investigations, this study adds to the small but growing body of research targeting food allergic stakeholders and provides additional insight into a second area of evolving research, food labeling. Generally speaking, this study found support for changes in purchase intention and attitude certainty as a direct result of allergen information congruency found on the front of the product package and the Nutrition Facts Panel.

Study results showed statistically significant support for changes between initial purchase intention based on allergen information found on the front of the food product label and purchase intention after exposure to information contained on the front of the

product label and the Nutrition Facts Panel. Specifically, information congruency between the front of label allergen information and the Nutrition Facts Panel positively impacted purchase intention and increased purchase intention when compared to initial purchase intention based on only the front of the food product label. Conversely, incongruency between the front of label allergen information and the Nutrition Facts Panel negatively impacted purchase intention and decreases purchase intention when compared to initial purchase intention based on only the front of the food product label.

Additionally, findings from this study showed statistically significant support for changes between initial overall attitude certainty based on allergen information found on the front of the food product label and overall attitude certainty after exposure to information contained on the front of the product label and the Nutrition Facts Panel. Specifically, information congruency between the front of label allergen information and the Nutrition Facts Panel positively impacted overall attitude certainty and increased overall attitude certainty when compared to initial overall attitude certainty based on only the front of the food product label. Similarly, incongruency between the front of label allergen information and the Nutrition Facts Panel negatively impacted overall attitude certainty and decreased purchase intention when compared to initial overall attitude certainty based on only the front of the food product label.

The final study finding relating to changes in attitude certainty of product safety showed statistically significant support for changes between initial attitude certainty of product safety based on allergen information found on the front of the food product label and attitude certainty of product safety after exposure to information contained on the front of the product label and the Nutrition Facts Panel. Specifically, information

congruency between the front of label allergen information and the Nutrition Facts Panel positively impacted attitude certainty of product safety and increased overall attitude certainty of product safety when compared to initial attitude certainty of product safety based on only the front of the food product label. The opposite held true for incongruency between the front of label allergen information and the Nutrition Facts Panel; incongruency negatively impacted attitude certainty of product safety and decreased purchase intention when compared to initial attitude certainty of product safety based on only the front of the food product label.

Public Policy Implications

From a public policy standpoint, additional improvements in food labeling must be made. The subject matter and design of this research was based on current public policy guidelines. Public policy made a large stride forward with the institution of food allergen labeling guidelines through FALCPA. Although the instituted public policy is a strong initial attempt, further improvements are needed.

For example, it should not be permissible to use the term "non-dairy" if a product contains dairy/milk ingredients. If a food allergic stakeholder were to rely on the "non-dairy" message located on the front and/or the back of the product label, the results could be devastating to a food allergic person. A strong basis to strengthen existing allergen policy is the elimination of use of misleading terms such as "non-dairy" or other nondefined or improperly defined terms, claims, or statements regarding allergens within a food product.

The mock-up food product labels used in this research study were based on current food product labels in the marketplace (Appendix A, Figures A1, A2, and A11).

In accordance with FDA guidelines, these food product labels and allergen disclosures meet federal allergen labeling requirements in the U.S. Since food allergen stakeholders have significant difficulties using current food labels for allergen identification, further allergen labeling improvements are needed.

The call for additional improvements does not infer a call to action for cumbersome and often incomprehensible federal guidelines. Rather, this call is for additional research focused on an alignment of policy intentions and consumer perceptions (Tonkin, Meyer, et al., 2016; Tonkin et al., 2015). As established by prior research, an overabundance of information on the food product label can prove just as troublesome and perplexing to the consumer as a lack of clear information. This overabundance may include but is not limited to generalized "catch-all" terms, such as "may contain" statements or other statements that convey no beneficial information to the allergic consumer. Such vague terms are neither regulated nor deliver any useful information on which food allergic stakeholders may base their food purchase decisions (Marchisotto et al., 2016; Tonkin, Meyer, et al., 2016; Tonkin et al., 2015). A well-executed, clear, and sensible approach to food allergen disclosure for food allergens is long overdue.

Based on the finding of this study, it is prudent to conclude that refined legislation is needed to help expedite clear and accurate food allergen disclosures. In the absence of such legislation, food allergic persons will likely continue to be misled and therefore become ill or worse due to accidental allergen ingestion. This researcher is not implying subversive intent by any party; nevertheless, it is extremely concerning that 70% of

respondents in this study accidentally purchased a food product that contained an allergen they were trying to avoid.

This 70% is a very distressing statistic when one considers 89% of respondents in this study self-identified as primary grocery shoppers and 84% of respondents self-identified as food allergic. Stated differently, 70% of the subjects reported having purchased a food product with the intent of avoiding a particular allergen, only to find that upon further inspection at home, the product contained a food allergen they were specifically trying to avoid. In furtherance of helping remedy food allergen disclosures in an expedited fashion, the following section will evaluate if food allergic persons have additional legal protections or if additional legislation exists that may help expedite food allergen disclosure changes.

The Americans With Disabilities Act, Food Allergies, and Allergic Consumers

The Americans With Disabilities Act (ADA) is a civil rights legal protection that was instituted to prevent policies, practices, and conditions that disadvantage certain classes of United States citizens (United States Equal Employment Opportunity Commission, 2002). ADA legislation mandates adherence by private and public institutions to allow individuals with disabilities the ability to have equal and full access to rights afforded to nondisabled Americans (United States Equal Employment Opportunity Commission, 2002). Furthermore, the ADA is supported and extends Section 504 of the 1973 Rehabilitation Act that forbids discrimination by public and private institutions (United States Equal Employment Opportunity Commission, 2002). With the protections afforded by these laws, protected classes of people cannot be denied rights or services due to a disability.

The following discussion provides support for the view that food allergy(s) should possibly be considered a disability that affords allergy sufferers protections under both the ADA and Section 504 of the 1973 Rehabilitation Act. Individuals who suffer from food allergies belong to a class of people or United States citizens who have a physical impairment that substantially limits major life activities and/or functions (United States Equal Employment Opportunity Commission, 2002). One major life function that severely limits food allergic consumers is consumption of food.

The overwhelming majority of medical professionals state complete avoidance of the particular food allergen is the sole method available for food allergic consumers to manage their allergic disease (AAAI, 2011d; USDHHS, 2013). Therefore, to safely consume packaged food products or other prepared foods, food allergic consumers need access to clear, complete, and accurate ingredient information. Without the ability to easily identify ingredients that are known allergens, allergic consumers are unable to safely eat many food products (Barnett, Leftwich, et al., 2011; Barnett, Muncer, et al., 2011; Buhl et al., 2008; Cornelisse-Vermaat et al., 2008; Crevel, 2001, 2002; Crevel et al., 2008; Miles, Fordham, Mills, Valovirta, & Mugford, 2005; Mills et al., 2007; Mills et al., 2004; Sakellariou et al., 2010; Simons et al., 2005; Taylor & Hefle, 2001; Verrill & Choinere, 2009).

This researcher further believes policymakers should require food manufacturers and food producers to accurately and clearly disclose all allergens above and beyond the minimum requirements established by FALCPA. For example, use of the term "non-dairy" on the product packaging when the product clearly contains a dairy ingredient in the ingredient listing should not be permissible. If ADA laws apply to food allergic

consumers, the only defense food manufacturers and food producers would have for noncompliance or adherence to ADA laws relates to what may be considered "undue burden." According to section 36.104 of the ADA Title III Regulation 28, CFR Part 36, noncompliance through use of a claim of "undue burden" is met when adherence or accommodation cannot be made without significant expense or difficulty. Since food manufacturers and producers are required to provide accurate disclosure of all ingredients, a claim of "undue burden" is not applicable.

Should a claim of "undue burden" be argued by food producers or manufacturers, their basis for such a claim would likely fail on several levels. The most important of these pertains to the 2006 FALCPA legislation which mandates compulsory disclosure of food allergens on food product packaging. Despite partial or full adherence with disclosure of food allergens on food product packaging, food producers and manufacturers have a duty to provide accurate disclosure of all food product ingredient information via the product label to food allergic consumers and stakeholders of food allergic consumers.

To provide accurate disclosure, use of the term "non-dairy" should not be permissible if the product does in fact contain any dairy ingredient. This disclosure is emphasized by medical professionals. A vocal proponent is Dr. Allessio Fasano, M.D., director of the Center for Celiac Research at Mass General Hospital for Children, visiting professor of pediatrics at Harvard Medical School, and member of the American Celiac Disease Alliance. According to Dr. Fasano, the product label is the preferred and usually only method of allergen information available to food allergic consumers (USDHHS, 2013).

As discussed earlier, the FDA has remained silent on specifically defining terms such as "non-dairy" and "dairy-free". In response to this silence, food manufacturers and producers have routinely made overt Product Label Claims such as "non-dairy," despite the food products containing dairy products or dairy derivatives. These patently false claims place dairy allergic consumers in life-threatening situations because, if they were to rely on these claims, the consumers may unknowingly consume dairy products. Not only has this study established the likelihood of allergic consumers making such errors, but prior research has substantiated that food allergic consumers use these claims to assess if a food product contains a particular food allergen and if the product is safe for consumption.

The governmental and the private sectors should be encouraged to act for several reasons. Foremost is the potential ADA compliancy issues outlined, to create an environment in which food allergic consumers can safely eat packaged food products without suffering accidental allergen ingestion due to misleading Product Label Claims or incorrect food product labeling. Strong action is needed to substantiate the seriousness of food allergen disclosure for food allergic consumers.

The researcher believes the identification of food allergic consumers as a protected class of persons as defined under the ADA guidelines would further buttress the rights and safety afforded to food allergic consumers under legislative mandates such as FALCPA. Inspection of each word represented by the acronym FALCPA (Food Allergen Labeling and Consumer Protection Act) may yield hopeful implications. The FDA may be opening the debate for ADA protections of food allergy sufferers via the last three words: Consumer Protection Act.

Managerial Implications

Food Allergen Information Congruency

The findings of this study have a number of explicit and general findings applicable to managers and businesses. Explicit findings suggest congruency between Product Label Claims contained on the front of the product label and the Nutrition Facts Panel information found on the back product label is extremely important for U.S. food allergy stakeholders' attitude towards product safety, overall attitude certainty, perception of milk/dairy, perceived credibility of claim, trust in nutrition information, trust in brand and label, and purchase intention. This research demonstrated food allergen information congruency between the front of the product label and the Nutrition Facts Panel was found to impact significantly both attitude certainty of product safety and overall attitude certainty of U.S. food allergy stakeholders.

These are important findings. Attitude certainty of product safety and overall attitude certainty among food allergic stakeholders is impacted significantly by congruency of allergen information. Therefore, it would be prudent for businesses to make certain allergen information conveyed through the product label and Nutrition Facts Panel is congruent to impact positively U.S. food allergy stakeholder attitude certainty of product safety and overall attitude certainty.

The study findings also highlight the importance of congruency between Product Label Claim and Nutrition Facts Panel information on food allergen identification. Specifically, the findings demonstrated perception of milk/dairy by U.S. food allergy stakeholders is impacted significantly by the congruency between the Product Label Claim found on the front of the package and the Nutrition Facts Panel information

commonly found on the back of the product packaging. This finding is important for businesses, since congruent allergen information conveyed through the product label and Nutrition Facts Panel impacts positively U.S. food allergy stakeholders' perception of allergens, including milk/dairy.

Current research findings also centered on trust of the consumer with regard to message communications conveyed through the food product label. Results showed the congruency between the front of the product label and the Nutrition Facts Panel significantly impacted both trust of nutrition information and trust in brand and label among U.S food allergy stakeholders. Since congruency between the front of the product label and the Nutrition Facts Panel significantly impacted both trust of nutrition information and trust in brand and label, businesses would improve trust of both the ingredients and the manufacturer/brand via a congruency of allergen information conveyed through both the Product Label Claim and the Nutrition Facts Panel.

Lastly, this study investigated the impact of congruency between the front of the product label and the Nutrition Facts Panel on purchase intention. The findings established that purchase intention of U.S. food allergic stakeholders was impacted significantly by food allergen information congruency between the front of the product label and the Nutrition Facts Panel. Therefore, if businesses aim to attract food allergen sensitive consumers directly, the businesses will likely increase sales through assurance of allergen information congruency.

From a general business practice perspective, accurate, clear, and unambiguous labeling can help reduce risk management liabilities while simultaneously benefiting the health and well-being of customers. Accidental ingestion of a specific food allergen by a

food allergic consumer due to confusing or contradictory allergen information exposes the food manufacturer to immense legal and financial liability, since accidental ingestion can trigger an allergic reaction that may result in anaphylaxis or death. As explained earlier, a single anaphylactic event may cause death. Irrespective of governmental allergen labeling mandates, companies can easily eliminate many of these liabilities and improve the customer experience through complete allergen disclosure in all food products and through the use of Product Label Claims that are consistent with actual allergens contained within the food product.

Not only does congruency between Product Label Claims and actual allergens contained in food products help eliminate risk management liabilities, including lawsuits, negative publicity, and governmental sanctions. Congruency simultaneously helps improve the customer shopping experience and helps provide brand loyalty. As indicated in the research, by the manufacturer providing accurate, clear and unambiguous allergen information, food allergic consumers and food allergic stakeholders will feel more confident about a given product's allergen ingredients and purchase the product if it is deemed safe to eat.

If these factors are carefully considered in the design of product labels and other communications, companies can likely increases sales, market share, and brand equity. If minimum standards are not met or exceeded, then companies may dramatically decrease company value and market share. A recent case in point was that of Chipotle Mexican Grill that recently lost significant sales and found its company valuation halved as a result of not meeting minimum food safety standards (Strom, 2016).

Consumer packaged food manufacturers and brands must also be aware that the purchaser may not be the ultimate end consumer of the food product. Food services professionals frequently use packaged food products as ingredients in the preparation of food dishes. Therefore, not only should the allergen information be clear and unambiguous for purchasers who are direct end users, but also for purchasers who prepare foods for end users with food allergies.

Food Allergen Information Elaboration

From an elaboration perspective, an overarching finding of this study pertains to food allergy stakeholders and their degree of involvement when using the product label for food allergen identification. The findings indicated that, irrespective of an overt allergen disclosure, food allergy stakeholders had either equal or nearly equal perception of milk/dairy, perceived credibility of claim, trust in brand and label, and purchase intention. These findings reinforce the notion that food allergy stakeholders are high involvement users of the product label; therefore, ease of use may prove helpful for these users. Although not tested in this study, for persons not well-versed in food allergen label usage and allergen identification, low elaboration messages may still prove useful for label users. Furthermore, clear disclosures will likely reduce some risk management liabilities due to food allergen label usage, including accidental ingestion from an improper allergen assessment by food allergy stakeholders**.**

A second finding showed that food allergy stakeholders exposed to the high elaboration condition spent more time reviewing the food product label and had increased attitude certainty compared to individuals presented with the low elaboration condition. This finding is important, since timely and effective food label usage is key in the grocery

store setting; decisions are frequently made with more haste than those in a more controlled and less time sensitive survey setting. Although time was not a controlled variable in this study, it can be presumed that the less time consumers are required to invest in reviewing the product label for an allergen, the more likely they would choose to purchase the low elaboration product versus that which displays a more complicated high elaboration product label.

Lastly, elaboration was found to be statistically significant for overall attitude certainty and trust in nutrition information. These findings highlight the role of elaboration for food allergy stakeholders when using product labels. The high elaboration condition required a higher degree of involvement of the food allergy stakeholder than the low elaboration condition. The high elaboration condition resulted in increased overall attitude certainty and trust in nutrition information.

Food Allergic Stakeholder Purchase Intention Evolvement

This research highlighted key changes between initial purchase intention and purchase intention, initial attitude certainty of product safety and overall attitude certainty of produce safety, and initial overall attitude certainty and overall attitude certainty. Overall, the study results found support for changes in purchase intention and attitude certainty as a direct result of allergen information congruency found on the front of the product package and the Nutrition Facts Panel. With regard to managers, an overarching theme is that purchase intention is directly impacted by the congruency of the food allergen communication, overall attitude certainty, and attitude certainty of product safety.

Ultimately, congruent food allergen communications positively impact purchase intention and incongruent food allergen communications negatively impact purchase intention. Furthermore, food allergy stakeholders had a significantly stronger purchase intention when presented with a congruent food allergen message conveyed through the front of the label and the Nutrition Facts Panel than when presented with only the front of label information. Not only was a direct change in purchase intention measured, but also statistically significant changes in both overall attitude certainty and attitude certainty of product safety were noted, both of which are drivers from purchase intention. Therefore, congruency appears to have both a mediating and moderating effect on purchase intention.

Manufacturers of consumer packaged food and brands may desire to implement the information provided from these findings to better serve food allergic stakeholders and simultaneously increase sales through the creation of engaging food product labels that require some degree of elaboration. Further market research and testing should be conducted to determine the precise degree of elaboration that provides maximum benefit to the consumer with minimal impact to factors such as overall attitude certainty and trust in nutrition information. Through a combination of both elaboration and congruency, manufacturers of consumer packaged food and brands can help create a safer and beneficial shopping environment for food allergic stakeholders that will also benefit the manufacturers.

Limitations and Future Research

Limitations

Three limitations are acknowledged for this study, as follows:

1. The study did not take place in an actual shopping environment, such as a grocery store, in which results may vary as a result of the environment.
2. The questionnaire was disseminated in only a single medium, a digital survey through Qualtrics Labs. Additional survey dissemination methods, including other digital survey providers and in-person administration, should be pursued to gain further clarity.
3. The study investigated a single type of consumer packaged food product. Additional types of consumer packaged food products may yield additional results.

Future Research

As evidenced by this research, congruency of food product package information impacts a number of factors, including attitude certainty towards product safety; overall attitude certainty; one's perception of an allergen, in this case dairy/milk, in the product; credibility of claim; trust in nutrition information; trust in brand and label; and purchase intention. These implications are extremely important on a number of levels. For instance, of the study respondent food allergy stakeholders, 84% self-identified as food allergic and 89% self-identified as the primary grocery shopper in the household.

Despite their vested interests in allergen avoidance as allergic consumers, 70% reported having purchased a packaged food product they thought was allergen-free. Upon

further investigation at home, they found that the product contained an allergen they were intentionally trying to avoid. These findings alone necessitate the need for additional allergen disclosure improvements and changes.

Thus, several recommendations may be made for future research. First, studies should test the robustness of the findings of this study and extend further research in this field. To target specifically the niche population of U.S. food allergic consumers and food allergic stakeholders, this researcher used Qualtrics Labs to administer the surveys and collect respondent data. Future researchers may wish to use a different data collection company to further test the same or similar hypotheses. In addition to gathering information from food allergic consumers and food allergic stakeholders, researchers may additionally wish to gather data by respondent allergy type, thereby identifying potential response differences within the generalized food allergic consumers and food allergic stakeholder category.

A separate issue not addressed in this research pertains to confusing or possibly conflicting disclosure statements that do not specifically identify an allergen through a disclosure statement. Rather, several forms of a general disclosure were identified by this researcher, including “may contain tree nuts,” “may contain milk,” and “produced in a facility that process on shared equipment.” A sample of labels in the marketplace that can create confusion appears in Figure A11 (Appendix A). Confusion may arise if a product contains dairy in the ingredient listing, does not contain a “contains milk” statement, but does contain a “may contain dairy” statement. This is a single instance of a labeling issue that warrants inquiry, since the product contains milk and does not disclose milk through an allergen statement but states the product “may” contain milk.

Not only may unclear statements create confusion, but emphasis on one allergen over another in an ingredient listing may create additional confusion. Figure A1 depicts an ingredient listing from an actual product in the marketplace that places emphasis on the second allergen “soy” by bold font of the word “soy” yet does not use bold font for the word “milk” in “milk fat.” During an inspection of the ingredient listing, one may be drawn to the bolded allergen and completely overlook the nonbolded milk ingredient. The use of bolded allergens was not tested in this study but likely warrants additional investigative inquiry.

This research was conducted in an online digitized environment. Future researchers may wish to extend this study though nonelectronic means of survey distribution or sampling, such as replicating the study in the grocery store to capture in-store purchase decisions. Performing research via nonelectronic dissemination would be useful because it would provide a good comparison between two separate methods of data collection: electronic via the Internet and nonelectronic questionnaires administered in a laboratory or other physical setting, such as a doctor's office or grocery store. Future researchers may also desire to target food allergic consumers and food allergic stakeholders internationally from a variety of countries or through country-specific data collection.

Although not tested in the study, an online shopping environment could be the subject of future research. Such inquiry could take place with access to and disclosure of food allergens and ingredients in an online shopping environment. Researchers have begun studies in this newly evolving area of research with explorations of the type of information sought by online food shoppers in online grocery environments (Benn,

Webb, Chang, & Reidy, 2015). Consistent with prior studies, Benn et al. (2015) found consumers preferred a more simplified conveyance of food information, including pictures, as opposed to detailed in-depth disclosures that required more time or thought to navigate.

Due to a variety of cultural, political, regulatory, geographical, and other factors, future researchers may likely find beneficial crosscultural investigations. For instance, studies could test differences in responses, if any, between consumers in the United States and those in member countries of the European Union, since both of these marketplaces have legislative mandates regarding food allergen disclosure. Findings from such a study would not only add to the growing collection of scholarly research but may also impact positively public policy, such as improved labeling of food allergens in domestic and international markets.

As food companies continue to pursue international markets, it is important to better understand international food allergic consumer and food allergic stakeholder profiles for the design of improved food labels specific to individual national markets. Despite a common assumption that there is a single approach to labeling allergens, variations could be revealed that would cause companies to be unable to use a single labeling model globally. Future research in this area will likely permit researchers in various countries to further understand food allergic consumers, stakeholders of food allergic consumers, and food allergen labeling to provide labeling recommendations that improve the food shopping experience and overall safety of food allergic consumers and food allergic stakeholders.

In addition to data gathering from additional adult food allergy sufferers and food allergy stakeholders such as food service staff, inquiry into food allergen identification among food allergic children and minors under the age of 18 will likely prove useful. Comprehension of food product labels and allergen identification by children and minors is paramount, since children and minors have the ability to make food selection choices without the immediate and direct oversight of an informed adult. In these instances, whether at school, camp, or programs such as aftercare, children's ability to easily identify food allergens is likely their primary source of allergen identification when not under the immediate and direct oversight of an informed adult. Based on this ability, additional research with subjects under the age of 18 will likely provide some foundational knowledge in this area of research. Emphasis should also be placed on the assumption that clear and accurate labeling is more important for the nonallergic person who is a caretaker for an allergic person.

The findings from this study can also be extended to include individuals who are either not food allergic or do not have a personal vested interest in food purchases for food allergic consumers. For example, this research established that food allergic individuals and food allergic stakeholders have trouble identifying allergens with current labeling guidelines. If these vested allergen stakeholders encounter issues with food allergen identification using food product labels, how accurately or confidently would nonvested or underinformed individuals interpret current food allergen labeling?

Restaurants and other food service businesses use various fresh and prepackaged ingredients to prepare foods. Food preparation in the food service environment creates challenges for food allergic consumers because of possible food allergen identification

and crosscontamination, among other reasons. Future researchers could investigate allergen knowledge and food allergen labeling usage by food service staff, including chefs, cooks, and preparation staff. Aside from the food preparation itself, investigation of allergen knowledge and allergen identification from front line staff such as waitstaff may prove beneficial to researchers, food allergy sufferers, and policy makers.

Although not tested in this study, the placement of the ingredients within the Nutrition Facts Panel is also of importance to stakeholders of food allergic consumers but to date has not been researched. According to FDA guidelines, food product ingredients must be listed in descending order according to the weight of each particular food ingredient used within the food product (USDHHS, 2009a). Weight is synonymous with prevalence of the ingredient in the food product, with the most prevalent ingredient listed first (USDHHS, 2009a).

For example, in Figure 1A (Appendix A), with the "O-Soy" yogurt product, it will be noticed that the first listed ingredient is "cultured pasteurized organic soy milk." Beneath the ingredient listing is a disclosure that the soy milk is cultured with the use of milk-derived cultures and therefore contains milk. Furthermore, the website for "O-Soy" advises dairy allergic consumers not to eat their soy yogurt because it does in fact contain milk protein (Stonyfield Farms, 2011). As explained earlier, individuals allergic to dairy products are allergic to milk protein. This listing presents an interesting paradox for persons allergic to dairy products; the first and therefore most prevalent ingredient in the product is comprised of both soy protein and milk protein. Therefore, future researchers may seek to determine if, through the placement of the disclosed allergen in the

ingredient listing, food allergy stakeholders are able to identify accurately the prevalence of the allergen within a given food product.

Other food type items, including alcohols, liquors, liqueurs and beers, do not have the same labeling requirements as consumer packaged foods. Therefore, additional understanding relating to food allergic consumers will also prove beneficial for public policy makers, researchers, allergic consumers and businesses that manufacture, sell, or use these items in their course of business. Further, with extension beyond food-related consumables, individuals allergic to items such as latex containing dairy ingredients have challenges with contact-based allergies. These nonconsumables do not have the same allergen labeling requirements as do consumer packaged food items and can be found in many products, from shampoos to surgical gloves. As with edibles, additional research relating to these nonconsumables will likely prove useful for those allergic to nonconsumables and society as a whole.

Summary

The findings of this study provide a strong basis for understanding the current state of U.S. food allergen labeling and the issues that impact U.S. food allergic stakeholders and their purchase decisions of consumer package foods. One overarching theme highlighted by this research suggests clear and accurate food allergen disclosures on consumer packaged food labels are needed to ensure the safety of food allergic individuals. As depicted in the many studies and legislation presented in this study, many steps have been taken towards improvement of food allergen disclosure (USDHHS, 2006, 2009a). In this study, the researcher identified additional issues with current guidelines and suggested new areas that require a more in-depth investigation by policy makers,

manufacturers, researchers, and food allergic consumers to ensure clear, accurate, and unambiguous disclosure of food allergens in the food supply.

Direct Action by Researcher

Based on the findings of this research, the researcher took steps to address directly allergen-related matters affecting allergic consumers and allergic stakeholders, irrespective of allergy type. The researcher will leverage over a decade of direct to consumer marketing experience with over three decades of firsthand food allergy and nonfood allergy knowledge to better serve this population of medically sensitive consumers. In furtherance of this objective, the researcher founded a new organization with the aim of directly serving allergic consumers and allergy stakeholders. Allergy Alert Network will serve as the vehicle and cornerstone of service, with the mission of helping improve the quality of life for allergic consumers through product and service offerings, research, consultation, and public policy guidance grounded in real-world data and insight. Through this organization, the researcher's aim is not only to help food allergy stakeholders but also encourage future research and influence policy towards the protections this extensive population deserves.

APPENDIX A

FIGURES

Figure A1

Product Name Implies and Brand Name Statement (Soy) Masks Milk Ingredient

Front of Package	Rear of Package

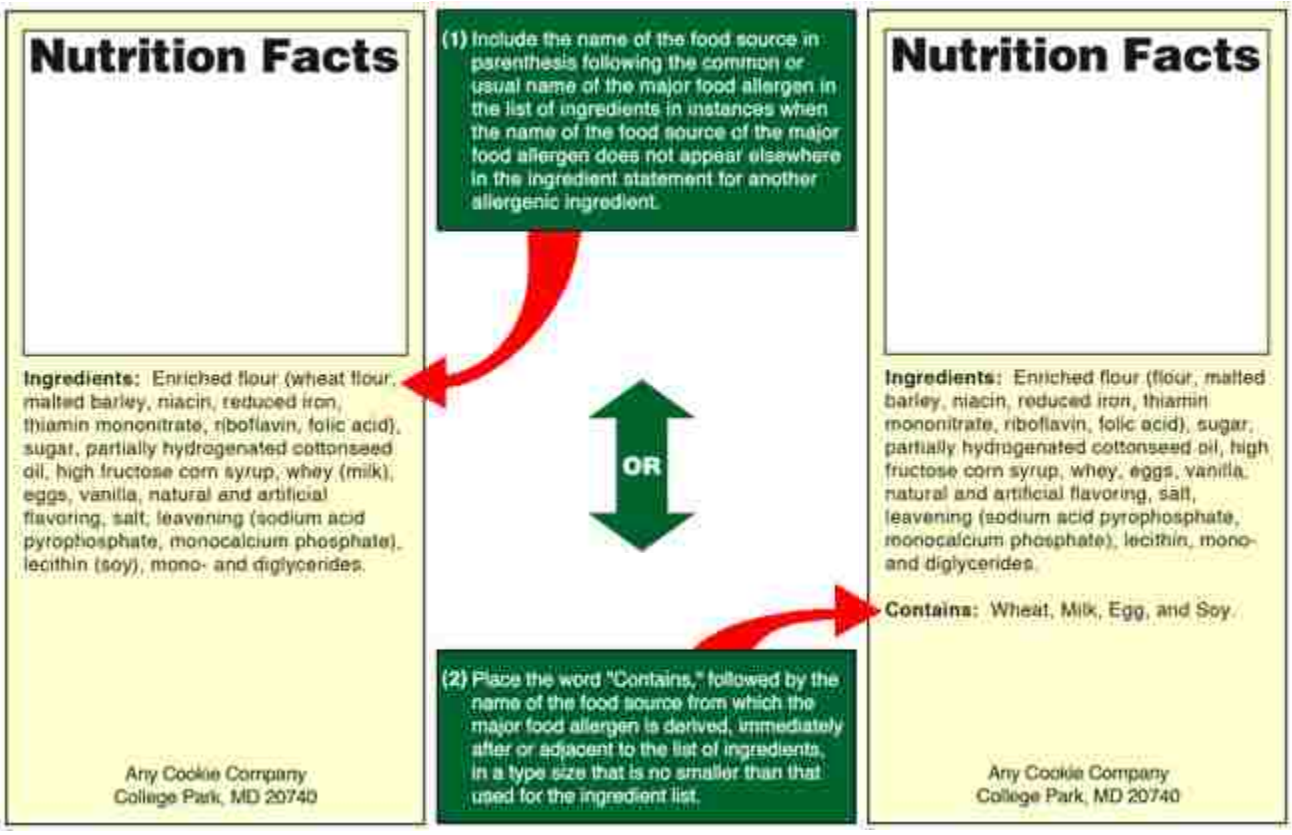
Figure A2

"Non-dairy" Claim on Front of Packaging With a Product that Contains Milk

Front of Package	Rear of Package

Figure A3

FDA Nutrition Facts Panel Guidelines



USDHHS (2009a). Retrieved from http://www.fda.gov/foodguidancecomplianceregulatoryinformation/guidancedocuments/foodlabelingnutrition/foodlabelingguide/ucm064880.htm.

Figure A4

Purchase Intention Model for Food Allergic Stakeholders (Researcher-Designed)

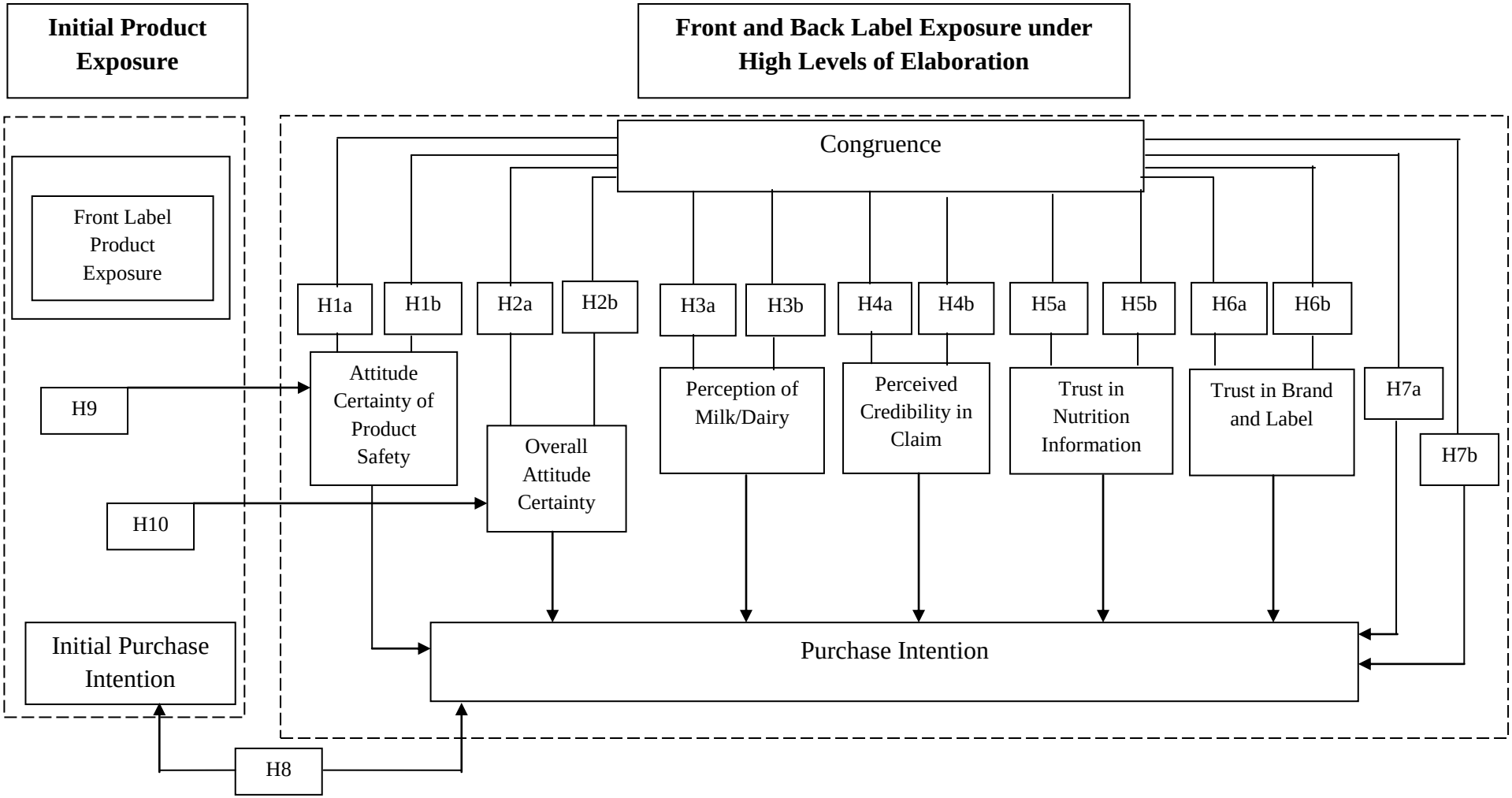


Figure A5

Congruent: High Elaboration

Food Product Label and Nutrition Facts Panel

(Product Does Not Contain Milk)

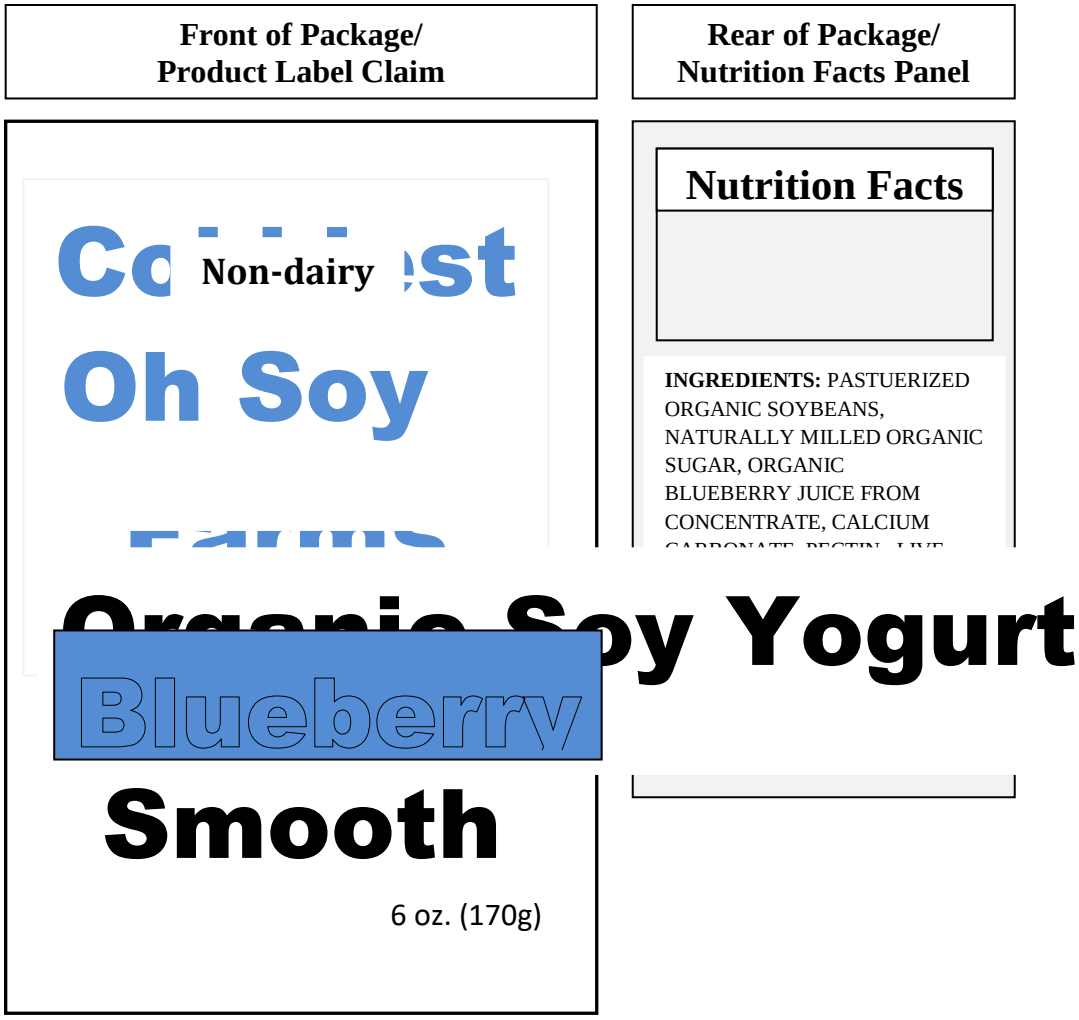


Figure A6

Incongruent: High Elaboration

Food Product Label and Nutrition Facts Panel

(Milk Disclosed in Ingredients Listing)

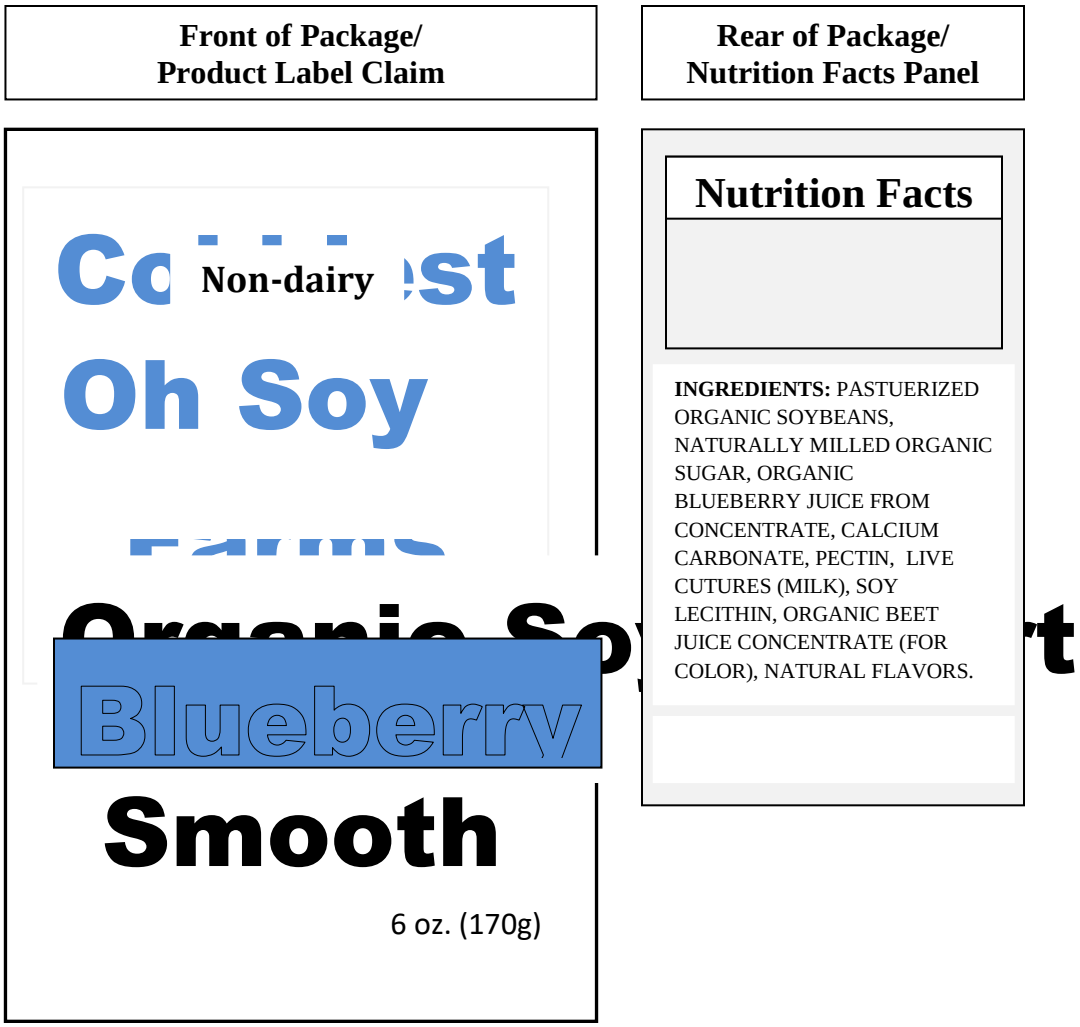


Figure A7

Congruent: Low Elaboration

Food Product Label and Nutrition Facts Panel

("Does Not Contain: Milk" Statement)

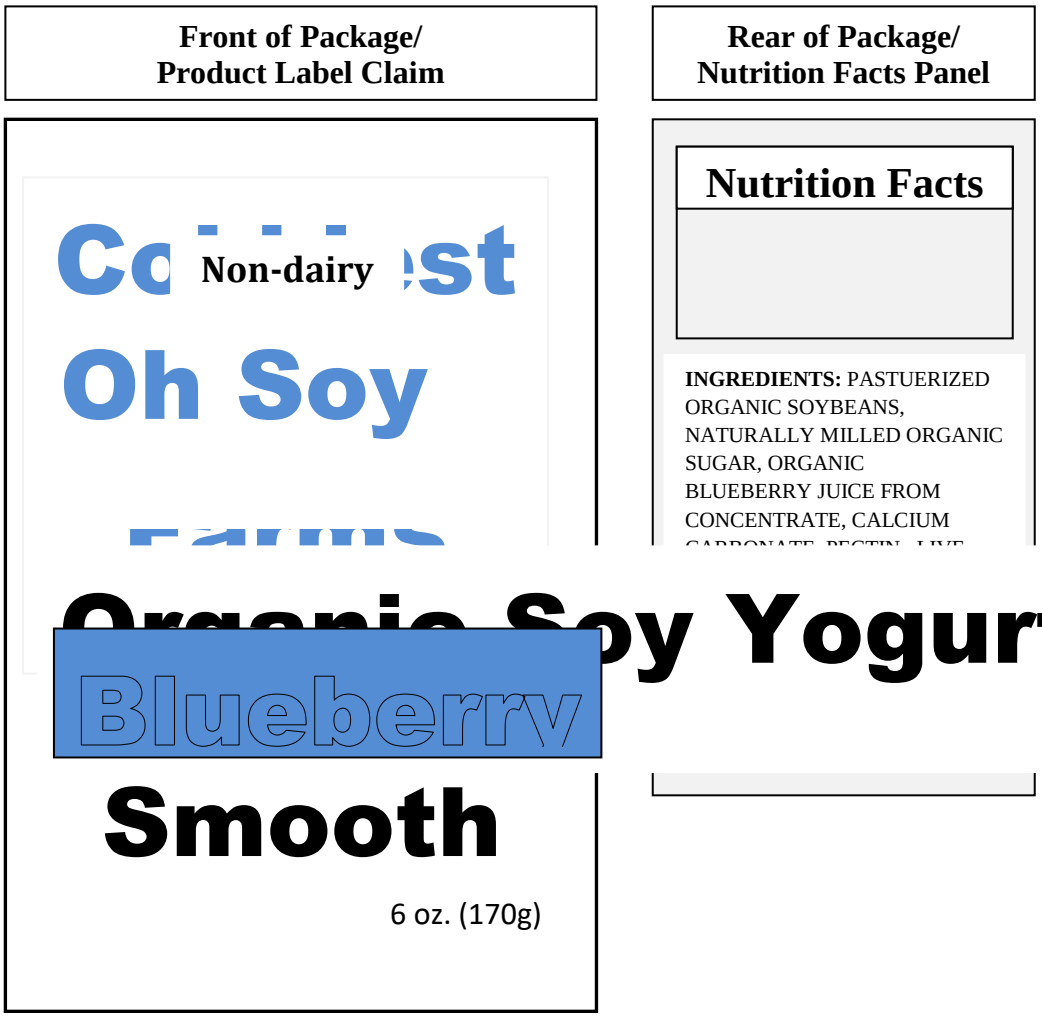


Figure A8

Incongruent: Low Elaboration

Food Product Label and Nutrition Facts Panel

(Milk Disclosed in "Contains" Statement)

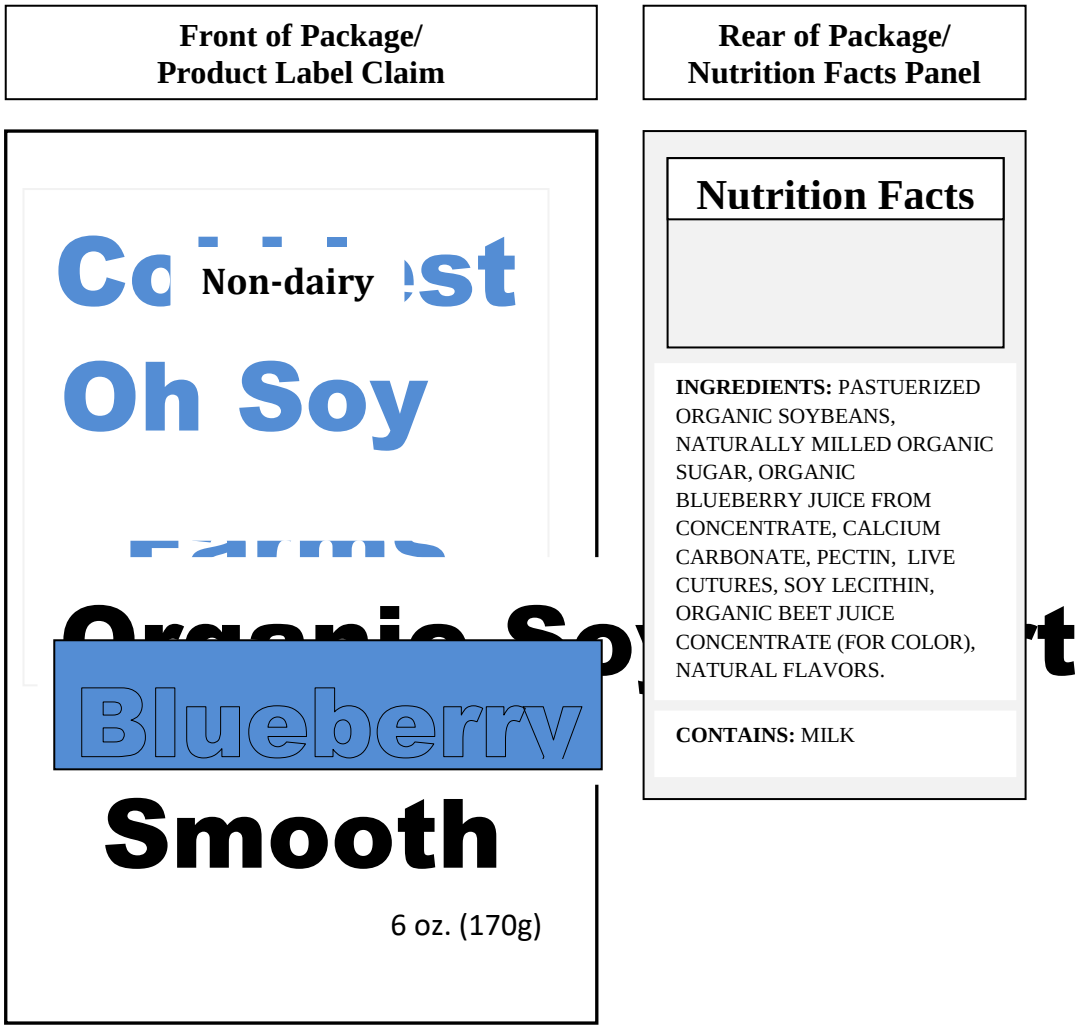
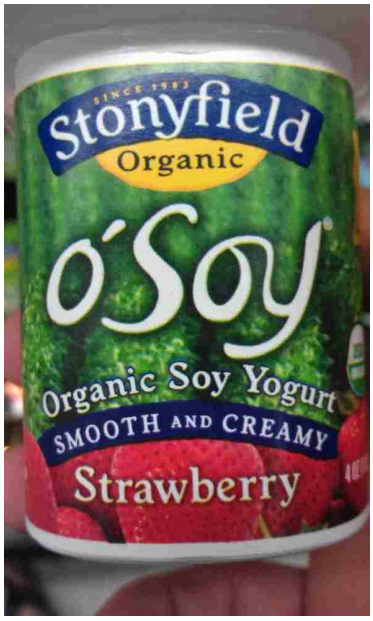


Figure A9

Comparison of Actual Product Examples and Mock-up Yogurt Label



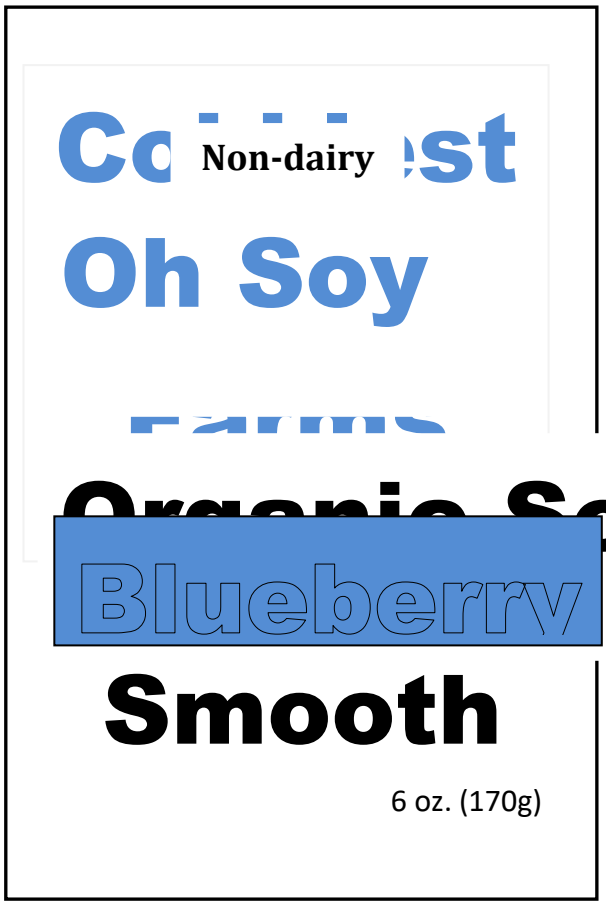


Figure A10

Comparison of FDA Required, Actual Product and Mock-up Nutrition Facts Panels Information

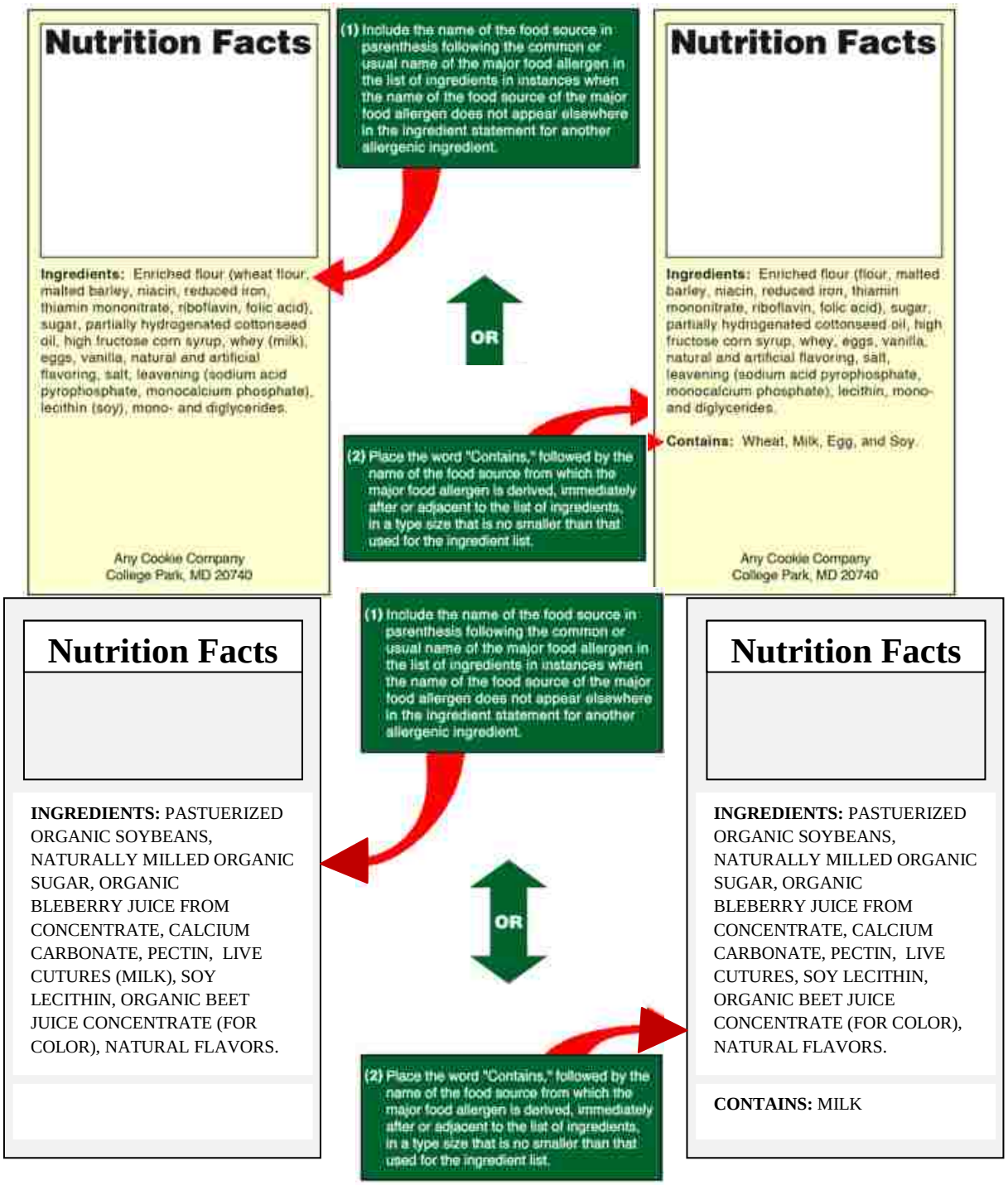


Figure A11

"May Contain Milk" When Product Contains Milk

APPENDIX B

TABLES

Table B1

Matrix of Studies

Matrix of Studies										
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Title of Article	**Author(s)**	Food allergy stakeholders utilize food product label information for allergen identification	Food allergy stakeholders have trouble using current food product labels	Food allergy stakeholders need access to allergenic substances in the food product	Product label important in allergen evaluation	Product label claim(s) important in allergen evaluation	Nutrition Facts Panel important in allergen evaluation	Name of food product influences stakeholder purchase	Prior use of food product influences stakeholder evaluation	Allergy labeling improvements needed
Optimising the delivery of food allergy information. An assessment of food allergic consumer preferences for different information delivery formats	(Voordouw et al., 2012)	**X**	**X**		**X**	**X**				**X**
Food allergy consumers' labelling preferences: a cross-cultural comparison	(Cornelisse-Vermaat et al., 2008)	**X**	**X**	**X**	**X**	**X**	**X**		**X**	**X**
Impact of ingredient labeling practices on food allergic consumers.	(Simons et al., 2005)	**X**	**X**	**X**	**X**	**X**	**X**			**X**
How do peanut and nut-allergic consumers use information on the packaging to avoid allergens?	(Barnett et al., 2011)	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**
Using 'may contain' labeling to inform food choice: a qualitative study of nut-allergic consumers	(Barnett et al., 2011)	**X**	**X**	**X**	**X**	**X**	**X**	**X**		**X**
Communication needs and food allergy: a summary of stakeholder views.	(Miles et al., 2006)									**X**
Attitudes towards low-allergen food in food allergic consumers	(Miles et al., 2005)	**X**		**X**	**X**					

Information provision for allergic consumers – where are we going with food allergen labelling?	(Mills et al., 2004)	**X**	**X**	**X**	**X**	**X**	**X**			
		A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**
Continued from prior page		Food allergy stakeholders utilize food product label information for allergen identification	Food allergy stakeholders have trouble using current food product labels	Food allergy stakeholders need access to allergenic substances in the food product	Product label important in allergen evaluation	Product label claim(s) important in allergen evaluation	Nutrition Facts Panel important in allergen evaluation	Name of food product influences stakeholder purchase	Prior use of food product influences stakeholder evaluation	Allergy labeling improvements needed
The prevalence, cost and basis of food allergy across Europe	(Mills et al., 2007)	**X**		**X**	**X**					
Ingredient and labeling issues associated with allergenic foods	(Taylor & Hefle, 2001)	**X**		**X**	**X**		**X**			**X**
Food allergen labelling and consumer confusion.	(Sakelliariou, Sinaniotis, Damianidou, Papadopoulos, & Vassilopoulou, 2010)	**X**	**X**	**X**	**X**					**X**
Thresholds for food allergens and their value to different stakeholders	(Crevel et al., 2008)	**X**		**X**	**X**					**X**
Industrial dimensions of food allergy	(R. Crevel, 2002)	**X**		**X**	**X**					
Risk assessment for food allergy – the industry viewpoint	(Crevel, 2001)	**X**		**X**	**X**					
The European Labelling Law for Foodstuffs Contains Life-Threatening Exemptions for Food-Allergic Consumers	(Buhl, Kampmann, Martinez, & Fuchs, 2008)	**X**	**X**	**X**	**X**		**X**			**X**
Are food allergen advisory statements really warnings?	(Verrill & Choinere,	**X**		**X**	**X**	**X**	**X**			

Variation in consumer preferences and consumption decisions	2009)									
# of Allergen Articles in Support of Claim		**15**	**6**	**14**	**15**	**7**	**8**	**2**	**2**	**9**

Table B2

Key Literature Relevant to Allergic Stakeholder Decision Process

Key Literature Relevant to Allergic Stakeholder Decision Process											
							Congruence of:				
Key Constructs For This Study			**Trust/ Attitude/ Purchase Intention**	**Trust/ Attitude/ Purchase Intention**	**Purchase Intention**	**Trust/ Attitude/ Purchase Intention**	**Product Label Claims**	**Nutrition Facts Panel**		**Trust/ Attitude/ Purchase Intention**	**Elaboration Likelihood Model (ELM)**
Title of Article	**Author(s)**	**Location of Study**	Food allergy stakeholders utilize food product label information for allergen identification	Food allergy stakeholders have trouble using current food product labels	Food allergy stakeholders need access to allergenic substances in the food product	Product label important in allergen evaluation	Product label claim(s) important in allergen evaluation	Nutrition Facts Panel important in allergen evaluation	Prior use of food product influences stakeholder evaluation	Allergy labeling improvements needed	
Food Allergic Consumer											
Optimising the delivery of food allergy information. An assessment of food allergic consumer preferences for different information delivery formats	(Voordouw et al., 2012)	Netherlands and Germany	**X**	**X**		**X**	**X**			**X**	
Food Allergic Consumer											
Food allergy consumers' labelling preferences: a cross-cultural comparison	(Cornelisse-Vermaat et al., 2008)	Netherlands and Greece	**X**	**X**	**X**	**X**	**X**	**X**	**X**	**X**	
Food Allergy Stakeholder											
Communication needs and food allergy: a summary of stakeholder views.	(Miles et al., 2006)	United Kingdom								**X**	
Food Allergic Consumer											
Attitudes towards low-allergen food in food allergic consumers	(Miles et al., 2005)	Netherlands, Austria, and Spain	**X**		**X**	**X**					
Food Allergy Stakeholder											
This research	Wortman	United States	**X**	**X**	**X**	**X**	**X**	**X**		**X**	**X**
# of Allergen Articles in Support of Claim			**4**	**3**	**3**	**4**	**3**	**2**	**1**	**4**	**1**

Table B3

Scaled Instrument Items Used in Study

Scaled Instrument Items Used in Study					
Hypothesis	**Independent Variable**	**Dependent Variable**	**Instrument**	**Reliability**	**Source**
H1a: Attitude certainty towards the product safety will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	Congruence of: 1) Nutrition Facts Panel -AND- 2) Product Label Claim.	Attitude Certainty of Product Safety	Please tell us your attitude regarding the safety of eating this product if you were avoiding milk/dairy ingredients on the following scales: *Bad (1)- Good (7)* *Negative (1) - Positive (7)* *Unfavorable (1)- Favorable (7)* *(Overall,)* How certain are you of your attitude toward this product? *Not at all Certain (1)- Very Certain (7)*	Not Reported **altered*	Rucker & Petty, 2006
H1b: Attitude Certainty towards the product safety will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	Elaboration of Product Packaging Allergen Information.	Attitude Certainty of Product Safety	Please tell us your attitude regarding the safety of eating this product if you were avoiding milk/dairy ingredients on the following scales: *Bad (1)- Good (7)* *Negative (1) - Positive (7)* *Unfavorable (1)- Favorable (7)* *(Overall,)* How certain are you of your attitude toward this product? *Not at all Certain (1)- Very Certain (7)*	Not Reported **altered*	Rucker & Petty, 2006
Hypothesis	**Independent**	**Dependent**	**Instrument**	**Reliability**	**Source**

	Variable	Variable			
H2a: Overall attitude certainty will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	Congruence of: 1) Nutrition Facts Panel -AND- 2) Product Label Claim.	Overall Attitude Certainty	How convinced are you that your *(overall)* attitude toward this product is correct? *Not at all Convinced (1)- Very Convinced (7)*	Not Reported **altered*	Rucker & Petty, 2006
H2b: Overall attitude certainty will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	Elaboration of Product Packaging Allergen Information.	Overall Attitude Certainty	How convinced are you that your *(overall)* attitude toward this product is correct? *Not at all Convinced (1)- Very Convinced (7)*	Not Reported **altered*	Rucker & Petty, 2006
H3a: Perception of milk/dairy will be higher (lower) for individuals presented with incongruent (congruent) product package allergen information.	Congruence of: 1) Nutrition Facts Panel -AND- 2) Product Label Claim. *See Figures 5 and 6 for manipulation.*	Perception of Milk/Dairy	How likely is it that this product contains dairy/milk ingredients: 1 (Unlikely) - 7 (Likely)	N/A	N/A
H3b: Perception of milk/dairy will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	Elaboration of Product Packaging Allergen Information.	Perception of Milk/Dairy	How likely is it that this product contains dairy/milk ingredients: 1 (Unlikely) - 7 (Likely)	N/A	N/A

Hypothesis	Independent Variable	Dependent Variable	Instrument	Reliability	Source
H4a: Perceived credibility of claim will be	Congruence of:	Credibility of	Disagree (1) - Agree (7) 1. The claims on the product label are true 2. I believe in the claims on the product label	Cronbach's Alpha	Putrevu & Lord, 1994

higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	1) Nutrition Facts Panel -AND- 2) Product Label Claim.	Claim	3.The product label is sincere 4. I think the product label is dishonest I felt that the claims located on the product label were: Not plausible (1)- Plausible (7) Not Credible (1) - Credible (7) Did Not Make Sense (1)- Did Make Sense (7)	.81 Cronbach's Alpha .85	Kent & Allen, 1994
H4b: Perceived credibility of claim will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	Elaboration of Product Packaging Allergen Information.	Credibility of Claim	Disagree (1) - Agree (7) 1. The claims on the product label are true 2. I believe in the claims on the product label 3.The product label is sincere 4. I think the product label is dishonest I felt that the claims located on the product label were: Not plausible (1)- Plausible (7) Not Credible (1) - Credible (7) Did Not Make Sense (1)- Did Make Sense (7)	Cronbach's Alpha .81 Cronbach's Alpha .85	Putrevu & Lord, 1994 Kent & Allen, 1994
Hypothesis	**Independent Variable**	**Dependent Variable**	**Instrument**	**Reliability**	**Source**
H5a: Trust in nutrition information will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	Congruence of: 1) Nutrition Facts Panel -AND- 2) Product Label Claim.	Trust in Nutrition Information	I trust the *ingredient* information shown in the Nutrition Facts Panel on the back of the package *Strongly Disagree (1) - Strongly Agree (7)*	Not Reported **altered*	Garretson & Burton, 2000
H5b: Trust in nutrition information will be	Elaboration of	Trust in		Not	

higher (lower) for individuals presented with low (high) elaboration product package allergen information.	Product Packaging Allergen Information.	Nutrition Information	I trust the *ingredient* information shown in the Nutrition Facts Panel on the back of the package *Strongly Disagree (1) - Strongly Agree (7)*	Reported **altered*	Garretson & Burton, 2000
H6a: Trust in brand and label will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	Congruence of: 1) Nutrition Facts Panel -AND- 2) Product Label Claim.	Trust in Brand and Label	I trust the *ingredient* information shown on the front of this package *Strongly Disagree (1) - Strongly Agree (7)* The manufacturer of the product is _____. Untrustworthy (1) - Trustworthy (7) Incompetent (1) - Competent (7) Dishonest (1) - Honest (7)	Not Reported **altered* Cronbach's Alpha .79	Roe, Levy, and Derby, 1999 Kirmani, 1997

Hypothesis	Independent Variable	Dependent Variable	Instrument	Reliability	Source
H6b: Trust in brand and label will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	Elaboration of Product Packaging Allergen Information.	Trust in Brand and Label	I trust the *ingredient* information shown on the front of this package *Strongly Disagree (1) - Strongly Agree (7)* The manufacturer of the product is _____. Untrustworthy (1) - Trustworthy (7) Incompetent (1) - Competent (7) Dishonest (1) - Honest (7)	Not Reported **altered* Cronbach's Alpha .79	Roe, Levy, and Derby, 1999 Kirmani, 1997
H7a: Purchase intention is higher (lower) with congruent (incongruent) product package allergen information.	Congruence of: 1) Nutrition Facts Panel -AND- 2) Product Label Claim.	Purchase Intention	How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients? Unlikely (1)- Likely (7) Uncertain (1)- Certain (7) Definitely Would Not (1)- Definitely Would (7)	N/A	N/A
H7b: Purchase intention is higher (lower) with low (high) elaboration product package allergen information.	Elaboration of Product Packaging Allergen Information.	Purchase Intention	How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients? Unlikely (1)- Likely (7) Uncertain (1)- Certain (7) Definitely Would Not (1)- Definitely Would (7)	N/A	N/A

Hypothesis	Independent Variable	Dependent Variable	Instrument	Reliability	Source
H8: Access to congruent (incongruent) product package allergen information increases (decreases) purchase intention as compared to just seeing the product label alone.	Congruence of: 1) Nutrition Facts Panel -AND- 2) Product Label Claim.	Purchase Intention	How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients? Unlikely (1)- Likely (7) Uncertain (1)- Certain (7) Definitely Would Not (1)- Definitely Would (7)	N/A	N/A

Hypothesis	Independent Variable	Dependent Variable	Instrument	Reliability	Source
H9: Access to congruent (incongruent) product package allergen information increases (decreases) attitude certainty of product safety as compared to just seeing the product label alone.	Congruence of: 1) Nutrition Facts Panel -AND- 2) Product Label Claim.	Attitude Certainty of Product Safety -AND- Purchase Intention	Please tell us your attitude regarding the safety of eating this product if you were avoiding milk/dairy ingredients on the following scales: *Bad (1)- Good (7)* *Negative (1) - Positive (7)* *Unfavorable (1)- Favorable (7)* *(Overall,)* How certain are you of your attitude toward this product? *Not at all Certain (1)- Very Certain (7)* -AND- How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients? Unlikely (1)- Likely (7) Uncertain (1)- Certain (7) Definitely Would Not (1)- Definitely Would (7)	Not Reported **altered* N/A	Rucker & Petty, 2006 N/A
H10: Access to congruent (incongruent) product package allergen information increases (decreases) overall attitude certainty as compared to just seeing the product label alone.	Congruence of: 1) Nutrition Facts Panel -AND- 2) Product Label Claim.	Overall Attitude Certainty	How convinced are you that your *(overall)* attitude toward this product is correct? *Not at all Convinced (1)- Very Convinced (7)*	Not Reported **altered*	Rucker & Petty, 2006

Table B4

Consistency Matrix

Consistency Matrix
Title Impact of Product Label Communication Congruency on Attitude Certainty and Purchase Intention for Food Allergy Stakeholders Under High And Low Levels of Elaboration **Statement of Problem** This paper seeks to contribute to the under-researched and newly emerging domain of food allergic consumers by conceptualizing a decision making process based on the degree of elaboration the consumer engages in when reading and evaluating information contained on the food product label and the Nutrition Facts Panel and the congruence of these two sources of information.

Research Questions

1. How does elaboration and congruency of product package allergen information affect attitude certainty of product safety?
2. Does attitude certainty of product safety mediate between congruency of product package allergen information and purchase intention?
3. How does elaboration and congruency of product package allergen information affect overall attitude certainty?
4. Does overall attitude certainty mediate between congruency of product package allergen information and purchase intention?
5. How does elaboration and congruency of product package allergen information affect perception of milk/dairy?
6. Does perception of milk/dairy mediate between congruency of product package allergen information and purchase intention?
7. How does elaboration and congruency of product package allergen information affect perceived credibility in claim?
8. Does perceived credibility in claim mediate between congruency of product package allergen information and purchase intention?
9. How does elaboration and congruency of product package allergen information affect trust in nutrition information?
10. Does trust in nutrition information mediate between congruency of product package allergen information and purchase intention?
11. How does elaboration and congruency of product package allergen information affect trust in brand and label?
12. Does trust in brand and label mediate between congruency of product package allergen information and purchase intention?
13. How does elaboration and congruency of product package allergen information affect purchase intention?
14. Is there a difference between initial purchase intention based on allergen information contained on the front of the product label and purchase intention based on the congruency and elaboration of allergen information found on the front and rear of the product package?
15. How does access to congruent (incongruent) product package allergen information affect attitude certainty to product safety and overall attitude certainty as compared to just seeing the product label alone?

Proposition	**Source(s) (Reference(s))**	**Instrument Item**	**Method of Analysis**
H1a: Attitude certainty towards the product safety will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	Rucker & Petty, 2006	Please tell us your attitude regarding the safety of eating this product if you were avoiding milk/dairy ingredients on the following scales: *Bad (1)- Good (7)* *Negative (1) - Positive (7)* *Unfavorable (1)- Favorable (7)* *(Overall,)* How certain are you of your attitude toward this product? *Not at all Certain (1)- Very Certain (7)*	ANCOVA

H1b: Attitude Certainty towards the product safety will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	Rucker & Petty, 2006	Please tell us your attitude regarding the safety of eating this product if you were avoiding milk/dairy ingredients on the following scales: *Bad (1)- Good (7)* *Negative (1) - Positive (7)* *Unfavorable (1)- Favorable (7)* *(Overall,)* How certain are you of your attitude toward this product? *Not at all Certain (1)- Very Certain (7)*	ANCOVA
H2a: Overall attitude certainty will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	Rucker & Petty, 2006	How convinced are you that your *(overall)* attitude toward this product is correct? *Not at all Convinced (1)- Very Convinced (7)*	ANCOVA
H2b: Overall attitude certainty will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	Rucker & Petty, 2006	How convinced are you that your *(overall)* attitude toward this product is correct? *Not at all Convinced (1)- Very Convinced (7)*	ANCOVA
H3a: Perception of milk/dairy will be higher (lower) for individuals presented with incongruent (congruent) product package allergen information.	N/A	How likely is it that this product contains milk/dairy ingredients: 1 (Unlikely) - 7 (Likely)	ANCOVA

H3b: Perception of milk/dairy will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	N/A	How likely is it that this product contains milk/dairy ingredients: 1 (Unlikely) - 7 (Likely)	ANCOVA
H4a: Perceived credibility of claim will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	Putrevu & Lord, 1994 Kent & Allen, 1994	Disagree (1) - Agree (7) 1. The claims on the product label are true 2. I believe in the claims on the product label 3.The product label is sincere 4. I think the product label is dishonest I felt that the claims located on the product label were: Not plausible (1)- Plausible (7) Not Credible (1) - Credible (7) Didn't Make Sense (1)- Did Make Sense (7)	ANCOVA
H4b: Perceived credibility of claim will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	Putrevu & Lord, 1994 Kent & Allen, 1994	Disagree (1) - Agree (7) 1. The claims on the product label are true 2. I believe in the claims on the product label 3.The product label is sincere 4. I think the product label is dishonest I felt that the claims located on the product label were: Not plausible (1)- Plausible (7) Not Credible (1) - Credible (7) Didn't Make Sense (1)- Did Make Sense (7)	ANCOVA

H5a: Trust in nutrition information will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	Garretson & Burton, 2000	I trust the *ingredient* information shown in the Nutrition Facts Panel on the back of the package *Strongly Disagree (1) - Strongly Agree (7)*	ANCOVA
H5b: Trust in nutrition information will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	Garretson & Burton, 2000	I trust the *ingredient* information shown in the Nutrition Facts Panel on the back of the package *Strongly Disagree (1) - Strongly Agree (7)*	ANCOVA
H6a: Trust in brand and label will be higher (lower) for individuals presented with congruent (incongruent) product package allergen information.	Roe, Levy, and Derby, 1999 Kirmani, 1997	I trust the *ingredient* information shown on the front of this package *Strongly Disagree (1) - Strongly Agree (7)* The manufacturer of the product is _____. Untrustworthy (1) - Trustworthy (7) Incompetent (1) - Competent (7) Dishonest (1) - Honest (7)	ANCOVA
H6b: Trust in brand and label will be higher (lower) for individuals presented with low (high) elaboration product package allergen information.	Roe, Levy, and Derby, 1999 Kirmani, 1997	I trust the *ingredient* information shown on the front of this package *Strongly Disagree (1) - Strongly Agree (7)* The manufacturer of the product is _____. Untrustworthy (1) - Trustworthy (7) Incompetent (1) - Competent (7) Dishonest (1) - Honest (7)	ANCOVA

H7a: Purchase intention is higher (lower) with congruent (incongruent) product package allergen information.	N/A	How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients? Unlikely (1)- Likely (7) Uncertain (1)- Certain (7) Definitely Would Not (1)- Definitely Would (7)	ANCOVA
H7b: Purchase intention is higher (lower) with low (high) elaboration product package allergen information.	N/A	How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients? Unlikely (1)- Likely (7) Uncertain (1)- Certain (7) Definitely Would Not (1)- Definitely Would (7)	ANCOVA
H8: Access to congruent (incongruent) product package allergen information increases (decreases) purchase intention as compared to just seeing the product label alone.	N/A	How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients? Unlikely (1)- Likely (7) Uncertain (1)- Certain (7) Definitely Would Not (1)- Definitely Would (7)	ANCOVA
H9: Access to congruent (incongruent) product package allergen information increases (decreases) attitude certainty of product safety as compared to just seeing the product label alone.	N/A	Hypothesized Relationship	t-test

H10: Access to congruent (incongruent) product package allergen information increases (decreases) overall attitude certainty as compared to just seeing the product label alone.	N/A	Hypothesized Relationship	t-test

Table B5

Combined Results from Pretest

Combined Results from Pretest					
N=20					
	Question	**Congruent-High Elaboration**	**Congruent-Low Elaboration**	**Incongruent-High Elaboration**	**Incongruent-Low Elaboration**
Q39_1	The information located on the Product Label and Nutrition Facts Panel is:-Congruent:Incongruent	**5.33**	**4.00**	**5.00**	**5.25**
Q39_2	The information located on the Product Label and Nutrition Facts Panel is:-Expected:Not Expected	**4.83**	**4.80**	**5.00**	**5.38**
Q39_3	The information located on the Product Label and Nutrition Facts Panel is:-Consistent:Inconsistent	**4.67**	**4.40**	**5.00**	**5.63**
Q40_1	When reading and comparing the Product Label and the Nutrition Fact Panel information, I found th...-Easily Identified:Not Easily Identified	**5.17**	**4.60**	**3.40**	**4.38**
Q40_2	When reading and comparing the Product Label and the Nutrition Fact Panel information, I found th...-Properly Labeled:Improperly Labeled	**5.17**	**4.20**	**2.60**	**5.00**
Q40_3	When reading and comparing the Product Label and the Nutrition Fact Panel information, I found th...-Not Confusing:Confusing	**4.83**	**4.60**	**4.20**	**5.25**

Table B6

Congruency and Elaboration Statistics

ANCOVA- Congruency and Elaboration									
Hypothesis #	**Hypothesis**	**Dependent Variable**	**N**	**Mean**	**Standard Deviation**	**df**	**Mean Square**	**F Statistic**	**Significance**
H1a	Attitude Towards Product Safety	Congruent	111	5.69	1.11	1	134.510	52.880	**0.000**
		Incongruent	112	4.14	1.95				
H1b	Attitude Towards Product Safety	Low Elaboration	107	4.77	1.44	1	4.310	1.370	0.242
		High Elaboration	116	5.05	2.02				
H2a	Overall Attitude Certainty	Congruent	111	5.79	1.19	1	36.630	12.930	**0.000**
		Incongruent	112	4.98	2.05				
H2b	Overall Attitude Certainty	Low Elaboration	107	5.09	1.41	1	17.560	6.010	**0.015**
		High Elaboration	116	5.65	1.93				
H3a	Perception of Milk/Dairy	Congruent	111	3.18	2.17	1	212.800	45.510	**0.000**
		Incongruent	112	5.13	2.14				
H3b	Perception of Milk/Dairy	Low Elaboration	107	4.15	2.05	1	0.029	0.005	0.943
		High Elaboration	116	4.17	2.63				
H4a	Perceived Credibility of Claim	Congruent	111	5.7	1.14	1	180.220	65.000	**0.000**
		Incongruent	112	3.91	2.05				
H4b	Perceived Credibility of Claim	Low Elaboration	107	4.82	1.39	1	0.690	0.190	0.890
		High Elaboration	116	4.78	2.25				
H5a	Trust in Nutrition Information	Congruent	111	5.76	1.26	1	19.220	7.070	**0.008**
		Incongruent	112	5.17	1.95				
H5b	Trust in Nutrition Information	Low Elaboration	107	5.23	1.3	1	11.570	4.200	**0.041**
		High Elaboration	116	5.69	1.93				

Hypothesis #	Hypothesis	Dependent Variable	N	Mean	Standard Deviation	df	Mean Square	F Statistic	Significance
H6a	Trust in Brand and Label	Congruent	111	5.44	1.17	1	173.250	53.700	**0.000**
		Incongruent	112	3.68	2.24				
H6b	Trust in Brand and Label	Low Elaboration	107	4.58	1.42	1	0.137	0.030	0.853
		High Elaboration	116	4.53	2.41				
H7a	Purchase Intention & Product Package Allergen Congruence	Congruent	111	5.2	1.59	1	181.700	49.290	**0.000**
		Incongruent	112	3.39	2.19				
H7b	Purchase Intention & Product Package Allergen Elaboration	Low Elaboration	107	4.29	1.73	1	0.000	0.000	0.992
		High Elaboration	116	4.29	2.42				
H8	Product Package Allergen Congruence & Purchase Intention vs. Initial Purchase Intention	Congruent	111	-0.43	1.57	1	191.220	45.660	**0.000**
		Incongruent	112	1.422	2.42				

Computed at the .05 significance level.

APPENDIX C

SURVEY 1: CONGRUENT HIGH ELABORATION—INGREDIENTS LISTING

Q49 What is your gender?

- ❍ Male (1)
- ❍ Female (2)

Q1 Do you shop for yourself or others that have a food allergy?

- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To End of Block

Q2 Please select your relationship to the food allergic person for whom you purchase food products (select all that apply):

- ❑ Self (1)
- ❑ Spouse (2)
- ❑ Dependent child (3)
- ❑ Parent (4)
- ❑ Extended family (5)
- ❑ Friend (6)
- ❑ Other (7) _____
- ❑ None (8)

If None Is Selected, Then Skip To End of Block

Q3 Please select all category(s) you or the food allergic person(s) belongs to (select all that apply):

- ❑ Lactose intolerant- digestive discomfort that can exhibit symptoms such as bloating and/or cramping (1)
- ❑ Dairy/Milk allergy- where an allergic reaction such as trouble breathing or skin rash is triggered by dairy products (2)
- ❑ Other food allergy- whereby allergen(s) are likely to trigger an allergic reaction (3)
- ❑ I do not buy foods for persons with food allergies (4)

Q4 How many of the food allergic person(s) you shop for have issues consuming dairy/milk products?

- ❍ 0 (1)
- ❍ 1 (2)
- ❍ 2 (3)
- ❍ 3 (4)
- ❍ 4 (5)
- ❍ 5 or more (6)

Q5 How important is it to you that you know if dairy/milk ingredients are in the product you or others consume?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not Very Important:Very Important (1)	❍	❍	❍	❍	❍	❍	❍

Q6 How frequently do you purchase grocery foods?

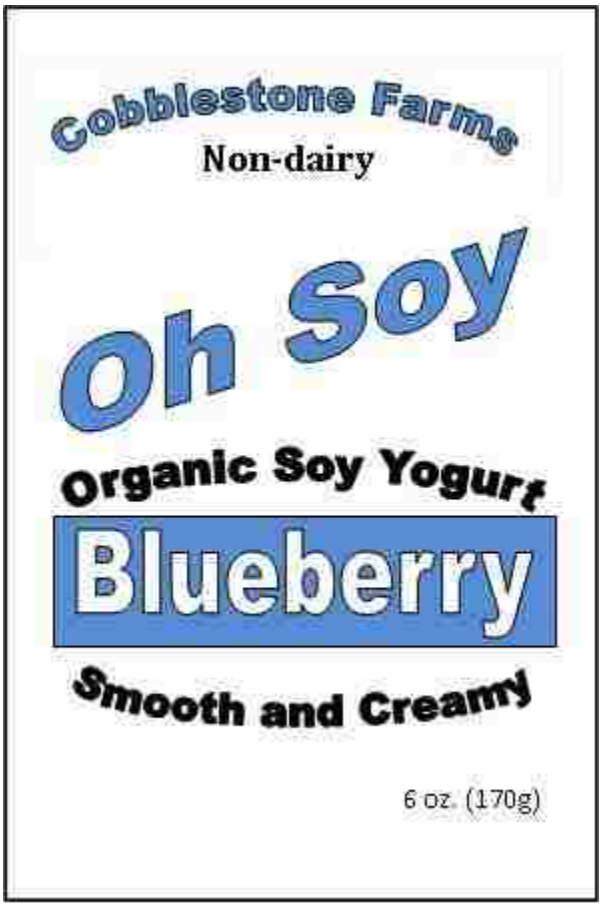
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All:Very Frequently (1)	❍	❍	❍	❍	❍	❍	❍

Q7 Please select the relationship(s) of the food allergic person(s) (select all that apply):

- ❑ Self (1)
- ❑ Spouse (2)
- ❑ Dependent Child (3)
- ❑ Parent (4)
- ❑ Extended Family (5)
- ❑ Friend (6)
- ❑ Other (7) _____

Q8 Throughout this survey, suppose you are shopping in a supermarket and purchasing food for a food allergic person allergic to dairy/milk ingredients. It is very important that no milk or dairy ingredients be in this product. Suppose you go to the store to purchase a dairy free yogurt. You see the below product label. Keeping this in mind, please answer the following questions by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



Q9 In my food shopping experience, I find this product to be personally _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Irrelevant:Relevant (1)	❍	❍	❍	❍	❍	❍	❍

Q10 How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unlikely:Likely (1)	❍	❍	❍	❍	❍	❍	❍
Uncertain:Certain (2)	❍	❍	❍	❍	❍	❍	❍
Definitely Would Not:Definitely Would (3)	❍	❍	❍	❍	❍	❍	❍

Q11 Please tell us your attitude towards the label:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Bad:Good (1)	❍	❍	❍	❍	❍	❍	❍
Negative:Positive (2)	❍	❍	❍	❍	❍	❍	❍
Unfavorable:Favorable (3)	❍	❍	❍	❍	❍	❍	❍

Q12 Please tell us your views towards the safety of eating this product if you are avoiding dairy/milk ingredients.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unsafe:Safe (1)	❍	❍	❍	❍	❍	❍	❍
Unclear:Clear (2)	❍	❍	❍	❍	❍	❍	❍
Dangerous:Not Dangerous (3)	❍	❍	❍	❍	❍	❍	❍
Causes Reaction:Does Not Cause Reaction (4)	❍	❍	❍	❍	❍	❍	❍
Definitely Will Cause Reaction:Definitely Will Not Cause Reaction (5)	❍	❍	❍	❍	❍	❍	❍
Misleading:Not Misleading (6)	❍	❍	❍	❍	❍	❍	❍

Q13 Overall, how certain are you of your attitude toward the safety of the product?

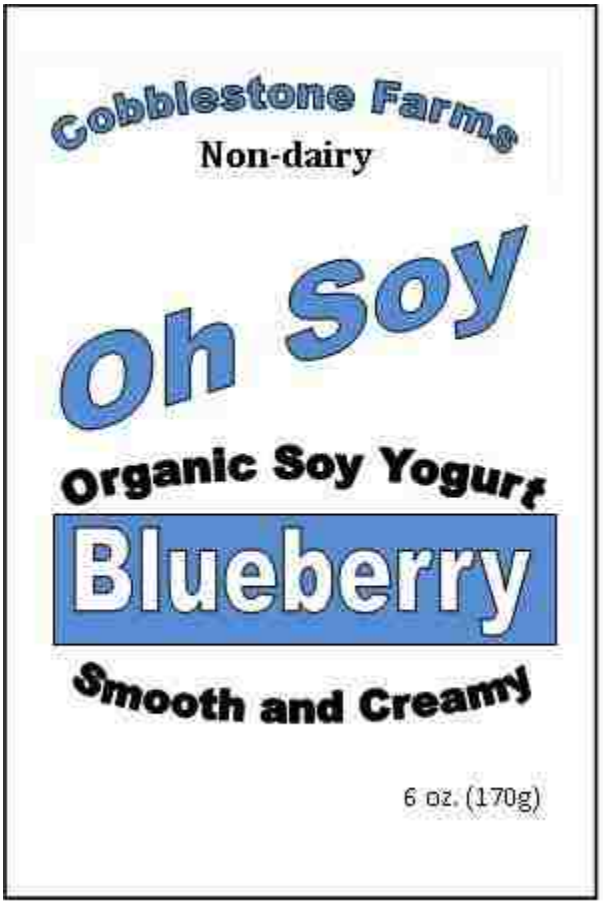
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Certain:Very Certain (1)	❍	❍	❍	❍	❍	❍	❍

Q14 How convinced are you that your overall attitude toward this product is correct?

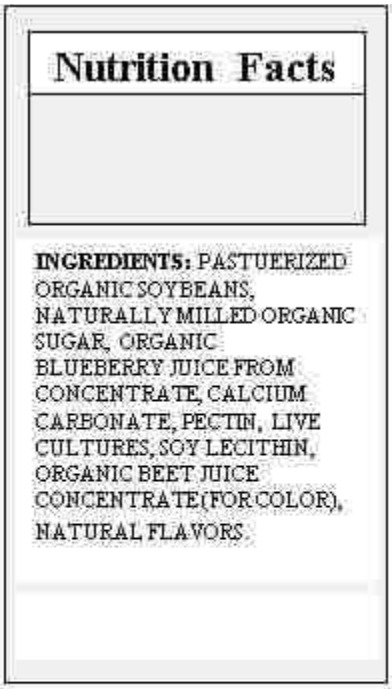
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Convinced:Very Convinced (1)	❍	❍	❍	❍	❍	❍	❍

Q15 Now suppose you pick up the product and read the Nutrition Facts Panel. Remember, It is very important that no milk or dairy ingredients be in this product. Keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q16 Please tell us your attitude towards the label:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Bad:Good (1)	❍	❍	❍	❍	❍	❍	❍
Negative:Positive (2)	❍	❍	❍	❍	❍	❍	❍
Unfavorable:Favorable (3)	❍	❍	❍	❍	❍	❍	❍

Q17 Please tell us your views towards the safety of eating this product if you are avoiding dairy/milk ingredients.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unsafe:Safe (1)	❍	❍	❍	❍	❍	❍	❍
Unclear:Clear (2)	❍	❍	❍	❍	❍	❍	❍
Dangerous:Not Dangerous (3)	❍	❍	❍	❍	❍	❍	❍
Causes Reaction:Does Not Cause Reaction (4)	❍	❍	❍	❍	❍	❍	❍
Definitely Will Cause Reaction:Definitely Will Not Cause Reaction (5)	❍	❍	❍	❍	❍	❍	❍
Misleading:Not Misleading (6)	❍	❍	❍	❍	❍	❍	❍

Q18 Overall, how certain are you of your attitude toward the safety of the product?

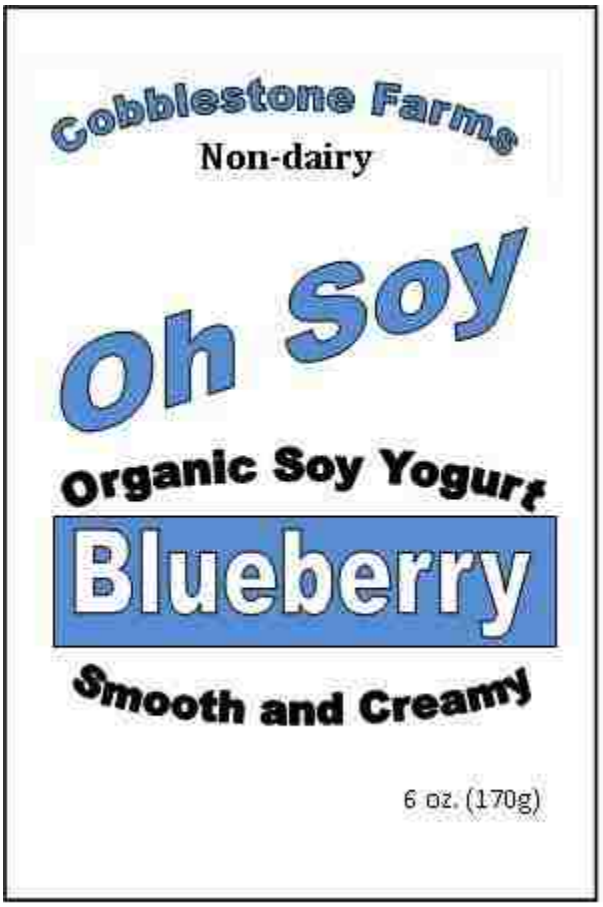
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Certain:Very Certain (1)	❍	❍	❍	❍	❍	❍	❍

Q19 How convinced are you that your overall attitude toward this product is correct?

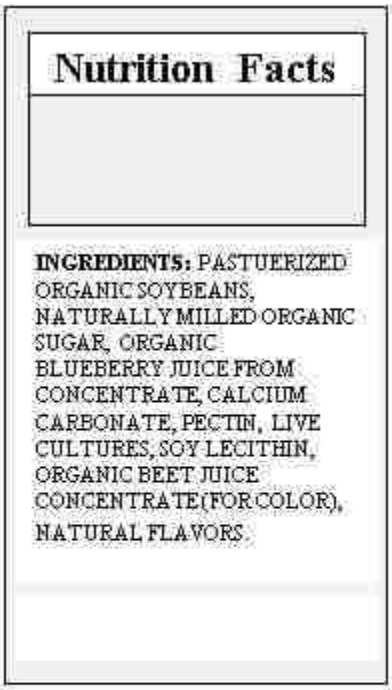
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Convinced:Very Convinced (1)	❍	❍	❍	❍	❍	❍	❍

Q20 Again, keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q21 How likely is it that this product contains dairy/milk ingredients?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unlikely:Likely (1)	❍	❍	❍	❍	❍	❍	❍

Q22 The claims on the product label are true.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q23 I believe in the claims on the product label.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q24 The product label is sincere.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q25 I think the product label is dishonest.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q26 I think the product label is deceptive.

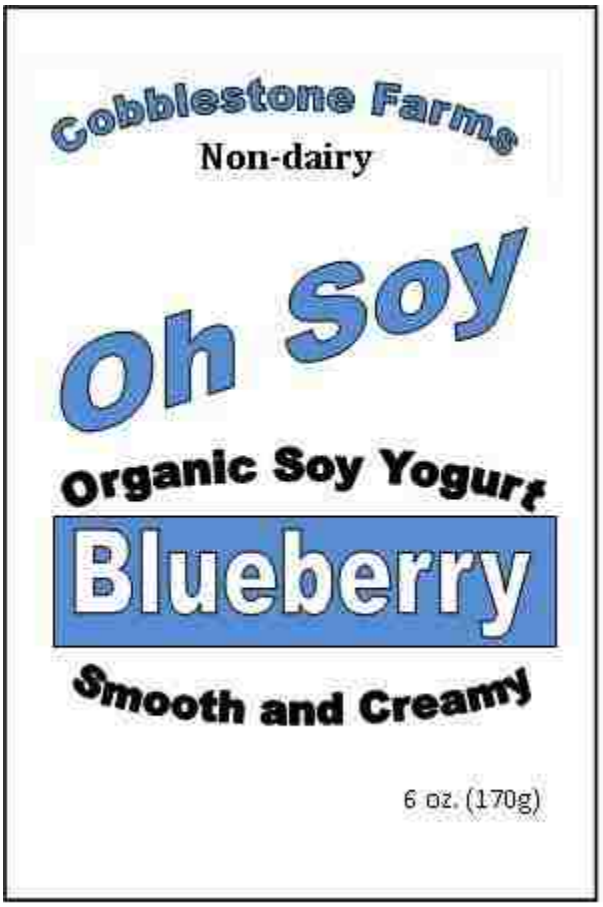
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q27 I think the product label is incorrect.

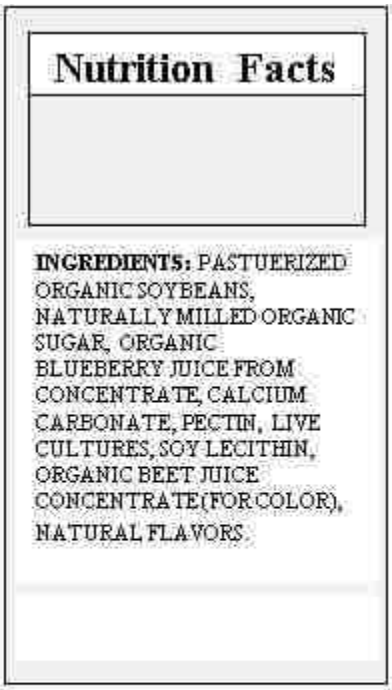
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q28 Again, keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q29 I trust the ingredient information shown on the front of this package.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q30 I trust the ingredient information shown in the Nutrition Facts Panel on the back of the package.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q31 I feel that the claims located on the Product Label are:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not Plausable:Plausable (1)	❍	❍	❍	❍	❍	❍	❍

Q32 I feel that the claims located on the Product Label are:

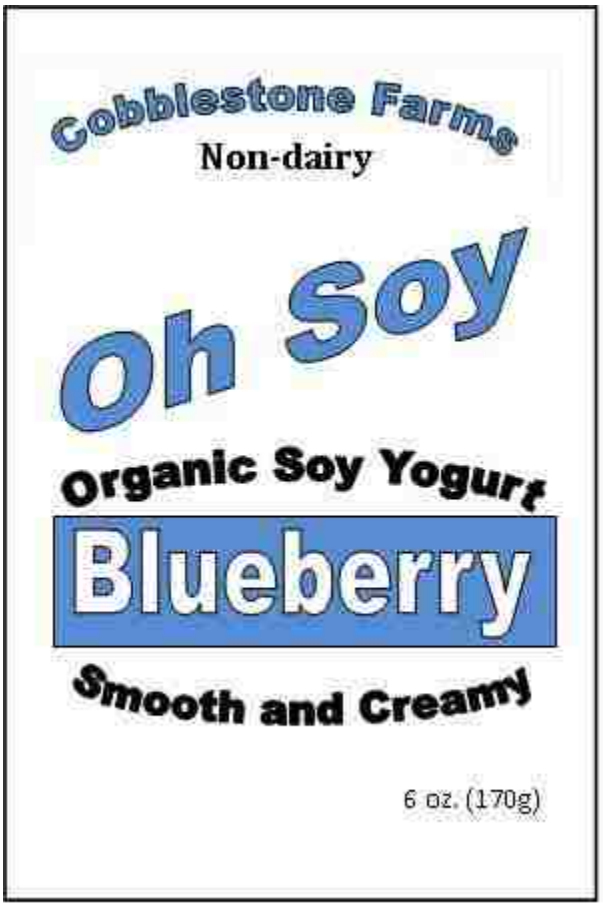
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not Credible:Credible (1)	❍	❍	❍	❍	❍	❍	❍

Q33 I feel that the claims located on the Product Label:

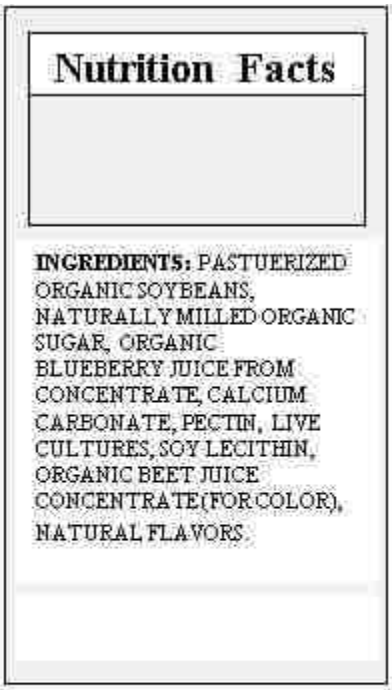
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Did Not Make Sense:Did Make Sense (1)	❍	❍	❍	❍	❍	❍	❍

Q34 Again, keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q35 The manufacturer of the product is _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Untrustworthy:Trustworthy (1)	❍	❍	❍	❍	❍	❍	❍

Q36 The manufacturer of the product is _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Incompetent:Competent (1)	❍	❍	❍	❍	❍	❍	❍

Q37 The manufacturer of the product is _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Dishonest:Honest (1)	❍	❍	❍	❍	❍	❍	❍

Q38 How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unlikely:Likely (1)	❍	❍	❍	❍	❍	❍	❍
Uncertain:Certain (2)	❍	❍	❍	❍	❍	❍	❍
Definitely Would Not:Definitely Would (3)	❍	❍	❍	❍	❍	❍	❍

Q39 The information located on the Product Label and Nutrition Facts Panel is:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Congruent:Incongruent (1)	❍	❍	❍	❍	❍	❍	❍
Expected:Not Expected (2)	❍	❍	❍	❍	❍	❍	❍
Consistent:Inconsistent (3)	❍	❍	❍	❍	❍	❍	❍

Q40 When reading and comparing the Product Label and the Nutrition Fact Panel information, I found the allergen information to be:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Easily Identified:Not Easily Identified (1)	❍	❍	❍	❍	❍	❍	❍
Properly Labeled:Improperly Labeled (2)	❍	❍	❍	❍	❍	❍	❍
Not Confusing:Confusing (3)	❍	❍	❍	❍	❍	❍	❍

Q41 I paid a lot of attention to the information that was presented to me.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All:Very Much (1)	❍	❍	❍	❍	❍	❍	❍

Q42 I thought a lot about the information and the arguments that were presented to me.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All:Very Much (1)	❍	❍	❍	❍	❍	❍	❍

Q43 Please answer the following questions by selecting the appropriate answer:

Q44 Have you purchased food products for a person suffering from food allergy in the last month?

- ❍ Yes (1)
- ❍ No (2)

Q45 Are you the primary grocery shopper in your household?

- ❍ Yes (1)
- ❍ No (2)

Q46 How frequently do you purchase groceries?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Infrequently:Frequently (1)	❍	❍	❍	❍	❍	❍	❍

Q47 I always read the product labels carefully in the store before making a purchase.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q48 What is your age

- ❍ 18-24 years old (1)
- ❍ 25-34 years old (2)
- ❍ 34-44 years old (3)
- ❍ 45-54 years old (4)
- ❍ 55-64 years old (5)
- ❍ 65-74 years old (6)
- ❍ 75 years or older (7)

Q50 What is your Ethnicity origin (or Race):

- White or Caucasian (1)
- Hispanic or Latino (2)
- Black or African American (3)
- Native American or American Indian (4)
- Asian or Pacific Islander (5)
- Other (6) _____
- Prefer not to answer (7)

Q51 Are you currently:

- Employed full time (1)
- Employed part time (2)
- Not employed (3)
- A student (4)
- Retired (5)
- Other (6) _____

Q52 Marital Status

- Married (1)
- Single (2)
- Widowed (3)
- Divorced (4)
- Partnership (5)

Q53 Number of children under the age of 18 living at home:

- 0 (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 or more (6)

Q54 What is the highest degree or level of school you have completed:

- ❍ Less than high school (1)
- ❍ High school graduate, diploma or the equivalent (for example: GED) (2)
- ❍ Some college credit, no degree (3)
- ❍ Trade/technical/vocational training (4)
- ❍ Associate degree (5)
- ❍ Bachelor's degree (6)
- ❍ Master's degree (7)
- ❍ Professional degree (8)
- ❍ Doctorate degree (9)

Q55 I have purchased food products for person(s) allergic to (select all that apply):

- ❑ Lactose (1)
- ❑ Eggs (2)
- ❑ Peanuts (3)
- ❑ Tree Nuts (4)
- ❑ Fish (5)
- ❑ Shellfish (6)
- ❑ Soy (7)
- ❑ Wheat (8)
- ❑ Milk (9)
- ❑ Other (10) _____
- ❑ None (11)

If None Is Selected, Then Skip To End of Block

Q56 When food shopping for the food allergic person(s), please select the number of allergen(s) you must avoid:

- ❍ One food allergen (1)
- ❍ Two food allergens (2)
- ❍ Three food allergens (3)
- ❍ Four food allergens (4)
- ❍ Five food allergens (5)
- ❍ Six or more food allergens (6)

Q57 I believe lactose intolerance is a food allergy.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q58 I believe eggs are included in the dairy/milk allergy category.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q59 I believe peanuts are included in the tree nuts allergy category.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q60 When food shopping for the food allergic person, please select the preferred allergen information source used for identification of allergens contained in the food product (select one):

- ❍ Product Label (1)
- ❍ Nutrition Facts Panel (2)
- ❍ Website (3)
- ❍ Store signage (4)
- ❍ Product brochure (5)
- ❍ Mobile application (6)
- ❍ Kosher designation (7)
- ❍ Other (8) _____

Q61 When food shopping for the food allergic person(s), please select the importance of the allergen information sources used for identification of allergens contained in the food product:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Product Label (1)	❍	❍	❍	❍	❍	❍	❍
Nutrition Facts Panel (2)	❍	❍	❍	❍	❍	❍	❍
Website (3)	❍	❍	❍	❍	❍	❍	❍
Store Signage (4)	❍	❍	❍	❍	❍	❍	❍
Product Brochure (5)	❍	❍	❍	❍	❍	❍	❍
Mobile Application (6)	❍	❍	❍	❍	❍	❍	❍
Kosher Designation (7)	❍	❍	❍	❍	❍	❍	❍

Q62 Have you ever purchased a product that you thought did not contain a food allergen yet found out later that it did contain a food allergen you were trying to avoid?

❍ Yes (1)
❍ No (2)

Answer If Have you ever purchased a product that you thought did not contain a food allergen yet found out later that it did contain a food allergen you were trying to avoid? Yes Is Selected

Q63 If yes, how often does this occur?

❍ Never (1)
❍ Rarely (2)
❍ Sometimes (3)
❍ Often (4)
❍ Always (5)

Q64 Have you or the food allergic person been diagnosed as suffering from a food allergy by a Medical Doctor?

- ❍ Yes, every food allergic person (1)
- ❍ Yes, some food allergic person(s) (2)
- ❍ No (3)
- ❍ Unsure (4)

Q65 Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food allergy?

- ❍ Yes (1)
- ❍ No (2)
- ❍ Unsure (3)

Answer If Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Yes Is Selected Or Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Unsure Is Selected

Q66 If yes, how many times do you recall that an epinephrine auto injector (i.e. EpiPen) was used by you or the food allergic person as a result of a food allergy?

- ❍ Never (1)
- ❍ One time (2)
- ❍ Two times (3)
- ❍ Three times (4)
- ❍ Four or more times (5)
- ❍ Unsure (6)

Answer If Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Yes Is Selected Or Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Unsure Is Selected

Q67 If yes, Do you know the expiration date of the epinephrine auto injector (i.e. EpiPen) you have in your control?

- ❍ Yes (1)
- ❍ No (2)
- ❍ Unsure (3)
- ❍ Epinephrine auto injectors do not have an expiration date (4)

Q68 Please rank the following statements concerning/about food allergen labeling from most important (1) to least important (6):

_____ Food allergen labeling needs to be easily recognizable by children. (1)
_____ Food allergen labeling needs to be easily recognizable by non-allergic persons. (2)
_____ Food allergen labeling needs to be easily recognizable by non-English speaking persons. (3)
_____ Food allergen labeling needs to be included on all food product labels. (4)
_____ Food allergen labeling and definitions need to be standardized on a global basis. (5)
_____ Other- Please describe. (6)

Q69 Please rank the following statements concerning/about food allergen labeling improvements from most important (1) to least important (5):

_____ Food allergens need to be disclosed through a prominently marked allergen statement located within the Nutrition Facts Panel. (1)
_____ Food allergens need to be disclosed through a prominently marked allergen statement located on the food product label (front, back, or side of label). (2)
_____ Food allergens need to be disclosed through a prominently marked multi-lingual allergen statement. (3)
_____ Food allergens need to be disclosed through an easily recognized symbol unique to each food allergen. (4)
_____ Other- Please describe. (5)

APPENDIX D

SURVEY 2: INCONGRUENT HIGH ELABORATION—INGREDIENTS LISTING

Q49 What is your gender?

- ❍ Male (1)
- ❍ Female (2)

Q1 Do you shop for yourself or others that have a food allergy?

- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To End of Block

Q2 Please select your relationship to the food allergic person for whom you purchase food products (select all that apply):

- ❑ Self (1)
- ❑ Spouse (2)
- ❑ Dependent child (3)
- ❑ Parent (4)
- ❑ Extended family (5)
- ❑ Friend (6)
- ❑ Other (7) _____
- ❑ None (8)

If None Is Selected, Then Skip To End of Block

Q3 Please select all category(s) you or the food allergic person(s) belongs to (select all that apply):

- ❑ Lactose intolerant- digestive discomfort that can exhibit symptoms such as bloating and/or cramping (1)
- ❑ Dairy/Milk allergy- where an allergic reaction such as trouble breathing or skin rash is triggered by dairy products (2)
- ❑ Other food allergy- whereby allergen(s) are likely to trigger an allergic reaction (3)
- ❑ I do not buy foods for persons with food allergies (4)

Q4 How many of the food allergic person(s) you shop for have issues consuming dairy/milk products?

- ❍ 0 (1)
- ❍ 1 (2)
- ❍ 2 (3)
- ❍ 3 (4)
- ❍ 4 (5)
- ❍ 5 or more (6)

Q5 How important is it to you that you know if dairy/milk ingredients are in the product you or others consume?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not Very Important:Very Important (1)	❍	❍	❍	❍	❍	❍	❍

Q6 How frequently do you purchase grocery foods?

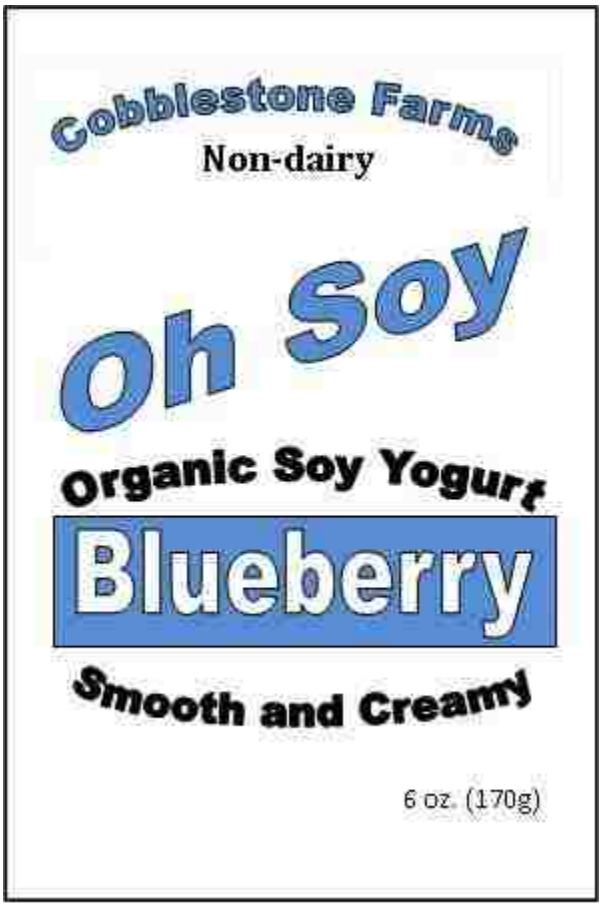
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All:Very Frequently (1)	❍	❍	❍	❍	❍	❍	❍

Q7 Please select the relationship(s) of the food allergic person(s) (select all that apply):

- ❑ Self (1)
- ❑ Spouse (2)
- ❑ Dependent Child (3)
- ❑ Parent (4)
- ❑ Extended Family (5)
- ❑ Friend (6)
- ❑ Other (7) _____

Q8 Throughout this survey, suppose you are shopping in a supermarket and purchasing food for a food allergic person allergic to dairy/milk ingredients. It is very important that no milk or dairy ingredients be in this product. Suppose you go to the store to purchase a dairy free yogurt. You see the below product label. Keeping this in mind, please answer the following questions by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



Q9 In my food shopping experience, I find this product to be personally _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Irrelevant:Relevant (1)	❍	❍	❍	❍	❍	❍	❍

Q10 How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unlikely:Likely (1)	❍	❍	❍	❍	❍	❍	❍
Uncertain:Certain (2)	❍	❍	❍	❍	❍	❍	❍
Definitely Would Not:Definitely Would (3)	❍	❍	❍	❍	❍	❍	❍

Q11 Please tell us your attitude towards the label:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Bad:Good (1)	❍	❍	❍	❍	❍	❍	❍
Negative:Positive (2)	❍	❍	❍	❍	❍	❍	❍
Unfavorable:Favorable (3)	❍	❍	❍	❍	❍	❍	❍

Q12 Please tell us your views towards the safety of eating this product if you are avoiding dairy/milk ingredients.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unsafe:Safe (1)	❍	❍	❍	❍	❍	❍	❍
Unclear:Clear (2)	❍	❍	❍	❍	❍	❍	❍
Dangerous:Not Dangerous (3)	❍	❍	❍	❍	❍	❍	❍
Causes Reaction:Does Not Cause Reaction (4)	❍	❍	❍	❍	❍	❍	❍
Definitely Will Cause Reaction:Definitely Will Not Cause Reaction (5)	❍	❍	❍	❍	❍	❍	❍
Misleading:Not Misleading (6)	❍	❍	❍	❍	❍	❍	❍

Q13 Overall, how certain are you of your attitude toward the safety of the product?

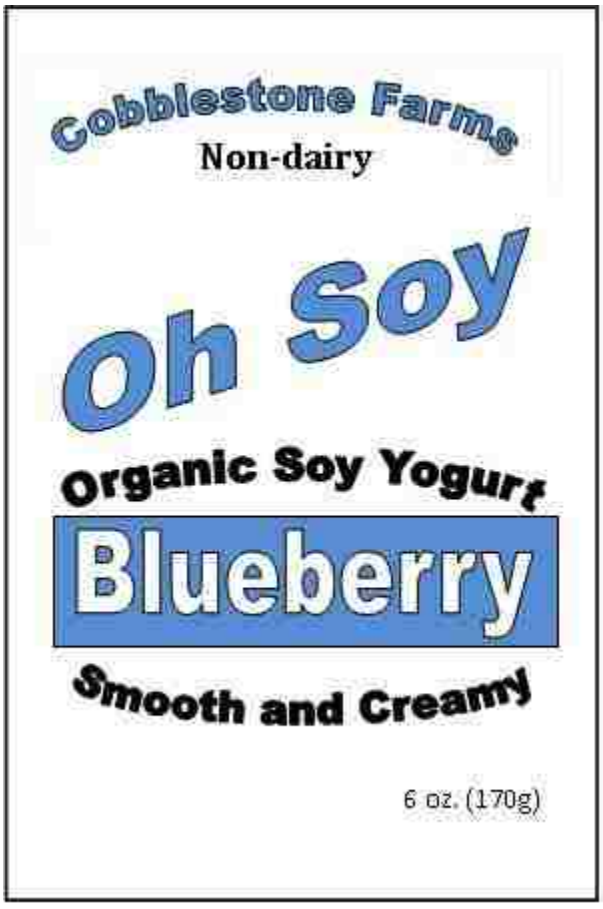
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Certain:Very Certain (1)	❍	❍	❍	❍	❍	❍	❍

Q14 How convinced are you that your overall attitude toward this product is correct?

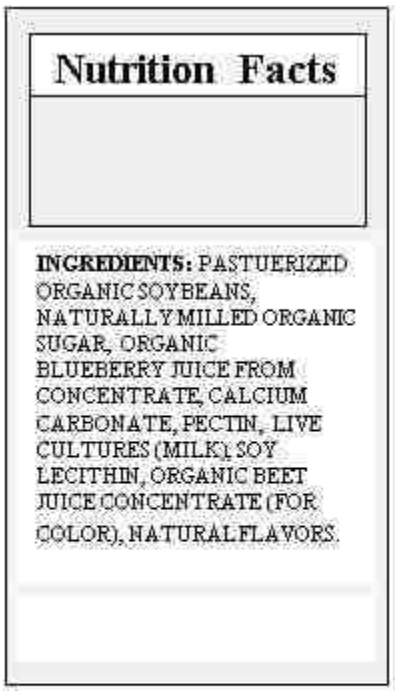
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Convinced:Very Convinced (1)	❍	❍	❍	❍	❍	❍	❍

Q15 Now suppose you pick up the product and read the Nutrition Facts Panel. Remember, It is very important that no milk or dairy ingredients be in this product. Keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q16 Please tell us your attitude towards the label:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Bad:Good (1)	❍	❍	❍	❍	❍	❍	❍
Negative:Positive (2)	❍	❍	❍	❍	❍	❍	❍
Unfavorable:Favorable (3)	❍	❍	❍	❍	❍	❍	❍

Q17 Please tell us your views towards the safety of eating this product if you are avoiding dairy/milk ingredients.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unsafe:Safe (1)	❍	❍	❍	❍	❍	❍	❍
Unclear:Clear (2)	❍	❍	❍	❍	❍	❍	❍
Dangerous:Not Dangerous (3)	❍	❍	❍	❍	❍	❍	❍
Causes Reaction:Does Not Cause Reaction (4)	❍	❍	❍	❍	❍	❍	❍
Definitely Will Cause Reaction:Definitely Will Not Cause Reaction (5)	❍	❍	❍	❍	❍	❍	❍
Misleading:Not Misleading (6)	❍	❍	❍	❍	❍	❍	❍

Q18 Overall, how certain are you of your attitude toward the safety of the product?

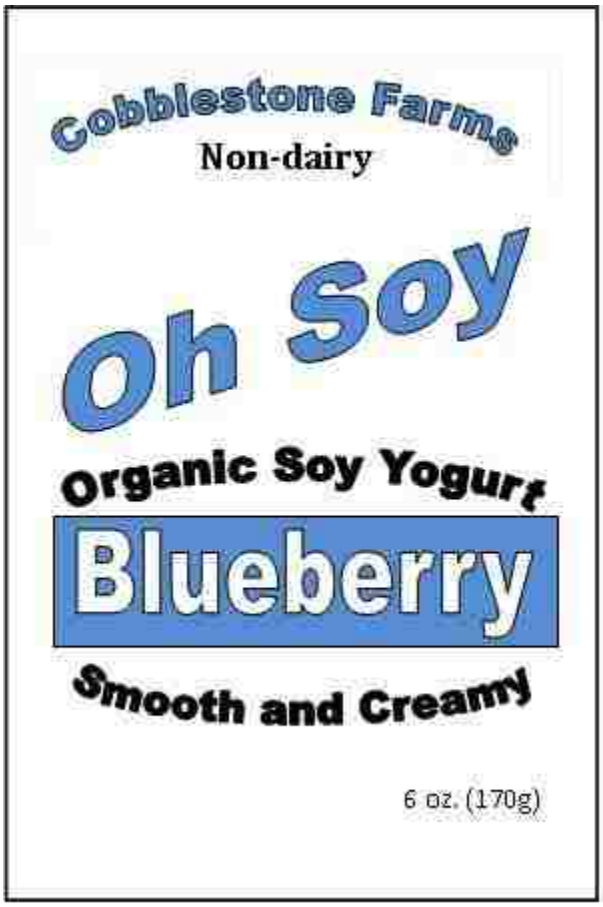
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Certain:Very Certain (1)	❍	❍	❍	❍	❍	❍	❍

Q19 How convinced are you that your overall attitude toward this product is correct?

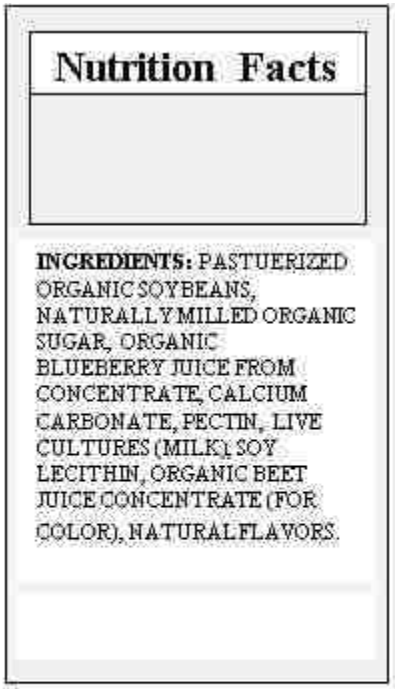
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Convinced:Very Convinced (1)	❍	❍	❍	❍	❍	❍	❍

Q20 Again, keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q21 How likely is it that this product contains dairy/milk ingredients?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unlikely:Likely (1)	❍	❍	❍	❍	❍	❍	❍

Q22 The claims on the product label are true.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q23 I believe in the claims on the product label.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q24 The product label is sincere.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q25 I think the product label is dishonest.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q26 I think the product label is deceptive.

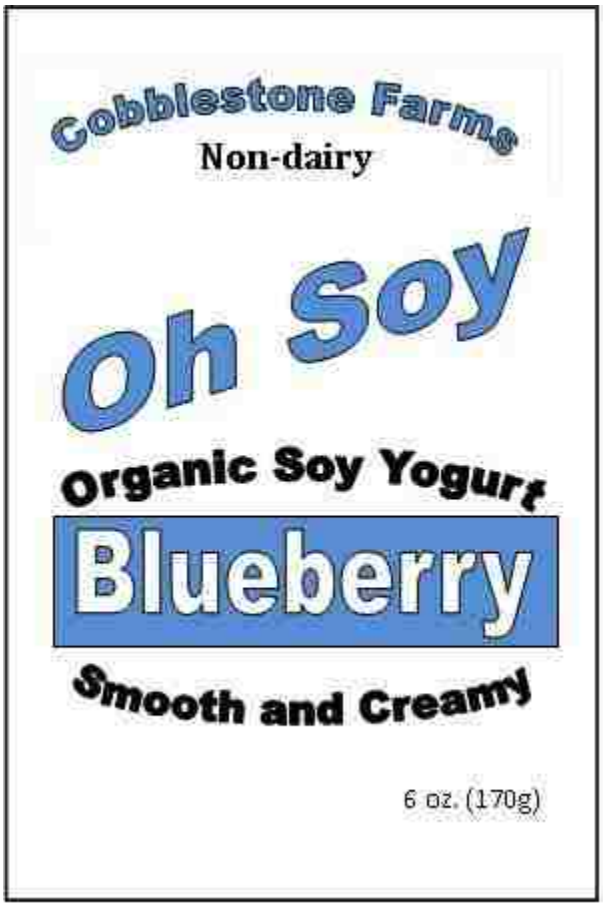
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q27 I think the product label is incorrect.

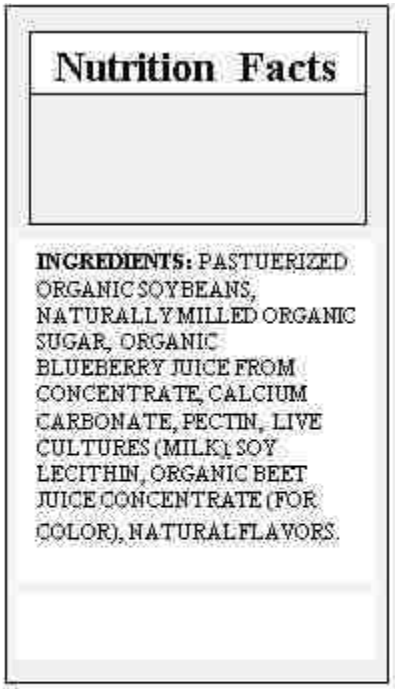
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q28 Again, keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q29 I trust the ingredient information shown on the front of this package.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q30 I trust the ingredient information shown in the Nutrition Facts Panel on the back of the package.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q31 I feel that the claims located on the Product Label are:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not Plausable:Plausable (1)	❍	❍	❍	❍	❍	❍	❍

Q32 I feel that the claims located on the Product Label are:

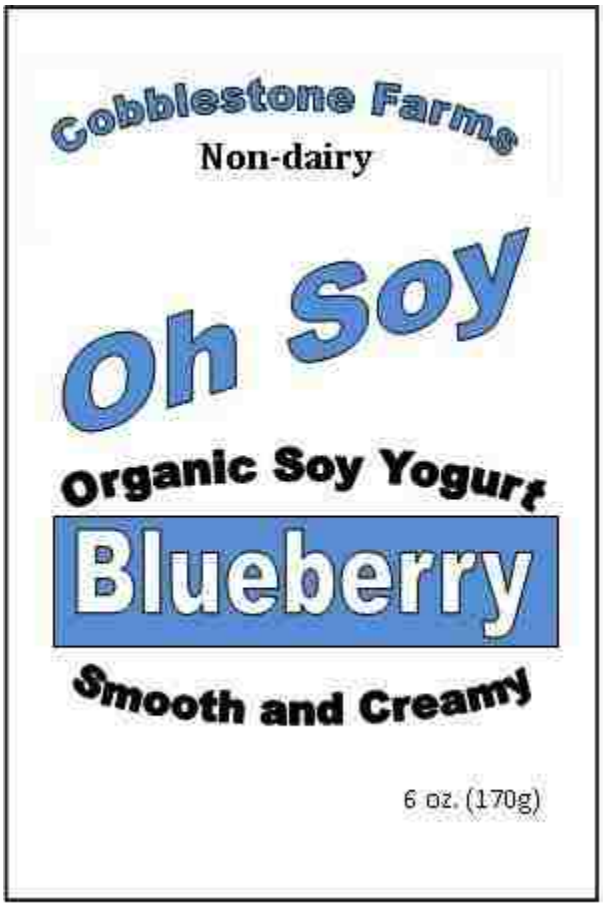
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not Credible:Credible (1)	❍	❍	❍	❍	❍	❍	❍

Q33 I feel that the claims located on the Product Label:

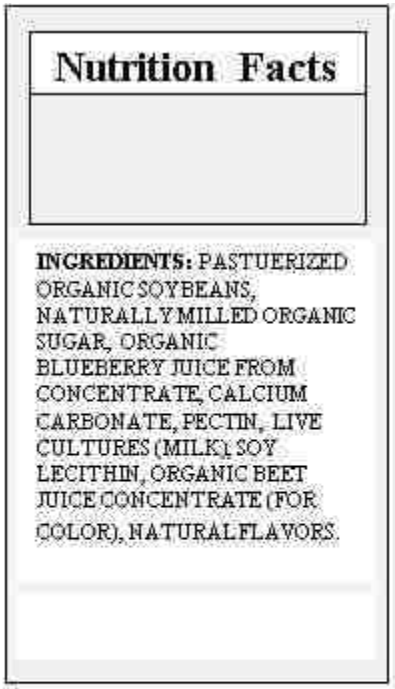
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Did Not Make Sense:Did Make Sense (1)	❍	❍	❍	❍	❍	❍	❍

Q34 Again, keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q35 The manufacturer of the product is _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Untrustworthy:Trustworthy (1)	❍	❍	❍	❍	❍	❍	❍

Q36 The manufacturer of the product is _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Incompetent:Competent (1)	❍	❍	❍	❍	❍	❍	❍

Q37 The manufacturer of the product is _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Dishonest:Honest (1)	❍	❍	❍	❍	❍	❍	❍

Q38 How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unlikely:Likely (1)	❍	❍	❍	❍	❍	❍	❍
Uncertain:Certain (2)	❍	❍	❍	❍	❍	❍	❍
Definitely Would Not:Definitely Would (3)	❍	❍	❍	❍	❍	❍	❍

Q39 The information located on the Product Label and Nutrition Facts Panel is:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Congruent:Incongruent (1)	❍	❍	❍	❍	❍	❍	❍
Expected:Not Expected (2)	❍	❍	❍	❍	❍	❍	❍
Consistent:Inconsistent (3)	❍	❍	❍	❍	❍	❍	❍

Q40 When reading and comparing the Product Label and the Nutrition Fact Panel information, I found the allergen information to be:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Easily Identified:Not Easily Identified (1)	❍	❍	❍	❍	❍	❍	❍
Properly Labeled:Improperly Labeled (2)	❍	❍	❍	❍	❍	❍	❍
Not Confusing:Confusing (3)	❍	❍	❍	❍	❍	❍	❍

Q41 I paid a lot of attention to the information that was presented to me.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All:Very Much (1)	❍	❍	❍	❍	❍	❍	❍

Q42 I thought a lot about the information and the arguments that were presented to me.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All:Very Much (1)	❍	❍	❍	❍	❍	❍	❍

Q43 Please answer the following questions by selecting the appropriate answer:

Q44 Have you purchased food products for a person suffering from food allergy in the last month?

- ❍ Yes (1)
- ❍ No (2)

Q45 Are you the primary grocery shopper in your household?

- ❍ Yes (1)
- ❍ No (2)

Q46 How frequently do you purchase groceries?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Infrequently:Frequently (1)	❍	❍	❍	❍	❍	❍	❍

Q47 I always read the product labels carefully in the store before making a purchase.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q48 What is your age

- ❍ 18-24 years old (1)
- ❍ 25-34 years old (2)
- ❍ 34-44 years old (3)
- ❍ 45-54 years old (4)
- ❍ 55-64 years old (5)
- ❍ 65-74 years old (6)
- ❍ 75 years or older (7)

Q50 What is your Ethnicity origin (or Race):

- White or Caucasian (1)
- Hispanic or Latino (2)
- Black or African American (3)
- Native American or American Indian (4)
- Asian or Pacific Islander (5)
- Other (6) _____
- Prefer not to answer (7)

Q51 Are you currently:

- Employed full time (1)
- Employed part time (2)
- Not employed (3)
- A student (4)
- Retired (5)
- Other (6) _____

Q52 Marital Status

- Married (1)
- Single (2)
- Widowed (3)
- Divorced (4)
- Partnership (5)

Q53 Number of children under the age of 18 living at home:

- 0 (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 or more (6)

Q54 What is the highest degree or level of school you have completed:

- ❍ Less than high school (1)
- ❍ High school graduate, diploma or the equivalent (for example: GED) (2)
- ❍ Some college credit, no degree (3)
- ❍ Trade/technical/vocational training (4)
- ❍ Associate degree (5)
- ❍ Bachelor's degree (6)
- ❍ Master's degree (7)
- ❍ Professional degree (8)
- ❍ Doctorate degree (9)

Q55 I have purchased food products for person(s) allergic to (select all that apply):

- ❑ Lactose (1)
- ❑ Eggs (2)
- ❑ Peanuts (3)
- ❑ Tree Nuts (4)
- ❑ Fish (5)
- ❑ Shellfish (6)
- ❑ Soy (7)
- ❑ Wheat (8)
- ❑ Milk (9)
- ❑ Other (10) _____
- ❑ None (11)

If None Is Selected, Then Skip To End of Block

Q56 When food shopping for the food allergic person(s), please select the number of allergen(s) you must avoid:

- ❍ One food allergen (1)
- ❍ Two food allergens (2)
- ❍ Three food allergens (3)
- ❍ Four food allergens (4)
- ❍ Five food allergens (5)
- ❍ Six or more food allergens (6)

Q57 I believe lactose intolerance is a food allergy.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q58 I believe eggs are included in the dairy/milk allergy category.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q59 I believe peanuts are included in the tree nuts allergy category.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q60 When food shopping for the food allergic person, please select the preferred allergen information source used for identification of allergens contained in the food product (select one):

- ❍ Product Label (1)
- ❍ Nutrition Facts Panel (2)
- ❍ Website (3)
- ❍ Store signage (4)
- ❍ Product brochure (5)
- ❍ Mobile application (6)
- ❍ Kosher designation (7)
- ❍ Other (8) _____

Q61 When food shopping for the food allergic person(s), please select the importance of the allergen information sources used for identification of allergens contained in the food product:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Product Label (1)	❍	❍	❍	❍	❍	❍	❍
Nutrition Facts Panel (2)	❍	❍	❍	❍	❍	❍	❍
Website (3)	❍	❍	❍	❍	❍	❍	❍
Store Signage (4)	❍	❍	❍	❍	❍	❍	❍
Product Brochure (5)	❍	❍	❍	❍	❍	❍	❍
Mobile Application (6)	❍	❍	❍	❍	❍	❍	❍
Kosher Designation (7)	❍	❍	❍	❍	❍	❍	❍

Q62 Have you ever purchased a product that you thought did not contain a food allergen yet found out later that it did contain a food allergen you were trying to avoid?

- ❍ Yes (1)
- ❍ No (2)

Answer If Have you ever purchased a product that you thought did not contain a food allergen yet found out later that it did contain a food allergen you were trying to avoid? Yes Is Selected

Q63 If yes, how often does this occur?

- ❍ Never (1)
- ❍ Rarely (2)
- ❍ Sometimes (3)
- ❍ Often (4)
- ❍ Always (5)

Q64 Have you or the food allergic person been diagnosed as suffering from a food allergy by a Medical Doctor?

- ❍ Yes, every food allergic person (1)
- ❍ Yes, some food allergic person(s) (2)
- ❍ No (3)
- ❍ Unsure (4)

Q65 Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food allergy?

- ❍ Yes (1)
- ❍ No (2)
- ❍ Unsure (3)

Answer If Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Yes Is Selected Or Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Unsure Is Selected

Q66 If yes, how many times do you recall that an epinephrine auto injector (i.e. EpiPen) was used by you or the food allergic person as a result of a food allergy?

- ❍ Never (1)
- ❍ One time (2)
- ❍ Two times (3)
- ❍ Three times (4)
- ❍ Four or more times (5)
- ❍ Unsure (6)

Answer If Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Yes Is Selected Or Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Unsure Is Selected

Q67 If yes, Do you know the expiration date of the epinephrine auto injector (i.e. EpiPen) you have in your control?

- ❍ Yes (1)
- ❍ No (2)
- ❍ Unsure (3)
- ❍ Epinephrine auto injectors do not have an expiration date (4)

Q68 Please rank the following statements concerning/about food allergen labeling from most important (1) to least important (6):

_____ Food allergen labeling needs to be easily recognizable by children. (1)
_____ Food allergen labeling needs to be easily recognizable by non-allergic persons. (2)
_____ Food allergen labeling needs to be easily recognizable by non-English speaking persons. (3)
_____ Food allergen labeling needs to be included on all food product labels. (4)
_____ Food allergen labeling and definitions need to be standardized on a global basis. (5)
_____ Other- Please describe. (6)

Q69 Please rank the following statements concerning/about food allergen labeling improvements from most important (1) to least important (5):

_____ Food allergens need to be disclosed through a prominently marked allergen statement located within the Nutrition Facts Panel. (1)
_____ Food allergens need to be disclosed through a prominently marked allergen statement located on the food product label (front, back, or side of label). (2)
_____ Food allergens need to be disclosed through a prominently marked multi-lingual allergen statement. (3)
_____ Food allergens need to be disclosed through an easily recognized symbol unique to each food allergen. (4)
_____ Other- Please describe. (5)

APPENDIX E

SURVEY 3: CONGRUENT LOW ELABORATION—DOES NOT CONTAIN MILK

Q49 What is your gender?

- ❍ Male (1)
- ❍ Female (2)

Q1 Do you shop for yourself or others that have a food allergy?

- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To End of Block

Q2 Please select your relationship to the food allergic person for whom you purchase food products (select all that apply):

- ❑ Self (1)
- ❑ Spouse (2)
- ❑ Dependent child (3)
- ❑ Parent (4)
- ❑ Extended family (5)
- ❑ Friend (6)
- ❑ Other (7) _____
- ❑ None (8)

If None Is Selected, Then Skip To End of Block

Q3 Please select all category(s) you or the food allergic person(s) belongs to (select all that apply):

- ❑ Lactose intolerant- digestive discomfort that can exhibit symptoms such as bloating and/or cramping (1)
- ❑ Dairy/Milk allergy- where an allergic reaction such as trouble breathing or skin rash is triggered by dairy products (2)
- ❑ Other food allergy- whereby allergen(s) are likely to trigger an allergic reaction (3)
- ❑ I do not buy foods for persons with food allergies (4)

Q4 How many of the food allergic person(s) you shop for have issues consuming dairy/milk products?

- ❍ 0 (1)
- ❍ 1 (2)
- ❍ 2 (3)
- ❍ 3 (4)
- ❍ 4 (5)
- ❍ 5 or more (6)

Q5 How important is it to you that you know if dairy/milk ingredients are in the product you or others consume?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not Very Important:Very Important (1)	❍	❍	❍	❍	❍	❍	❍

Q6 How frequently do you purchase grocery foods?

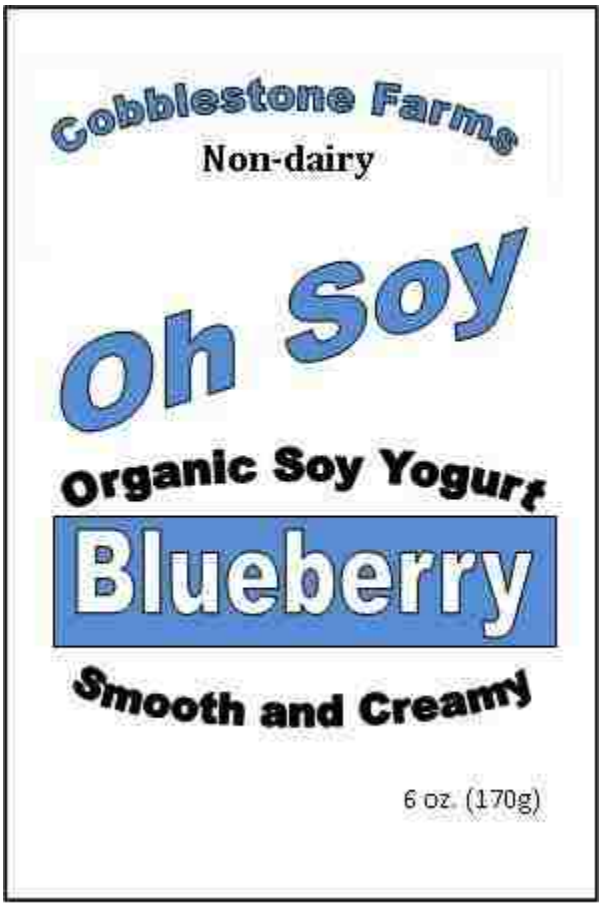
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All:Very Frequently (1)	❍	❍	❍	❍	❍	❍	❍

Q7 Please select the relationship(s) of the food allergic person(s) (select all that apply):

- ❑ Self (1)
- ❑ Spouse (2)
- ❑ Dependent Child (3)
- ❑ Parent (4)
- ❑ Extended Family (5)
- ❑ Friend (6)
- ❑ Other (7) _____

Q8 Throughout this survey, suppose you are shopping in a supermarket and purchasing food for a food allergic person allergic to dairy/milk ingredients. It is very important that no milk or dairy ingredients be in this product. Suppose you go to the store to purchase a dairy free yogurt. You see the below product label. Keeping this in mind, please answer the following questions by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



Q9 In my food shopping experience, I find this product to be personally _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Irrelevant:Relevant (1)	❍	❍	❍	❍	❍	❍	❍

Q10 How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unlikely:Likely (1)	❍	❍	❍	❍	❍	❍	❍
Uncertain:Certain (2)	❍	❍	❍	❍	❍	❍	❍
Definitely Would Not:Definitely Would (3)	❍	❍	❍	❍	❍	❍	❍

Q11 Please tell us your attitude towards the label:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Bad:Good (1)	❍	❍	❍	❍	❍	❍	❍
Negative:Positive (2)	❍	❍	❍	❍	❍	❍	❍
Unfavorable:Favorable (3)	❍	❍	❍	❍	❍	❍	❍

Q12 Please tell us your views towards the safety of eating this product if you are avoiding dairy/milk ingredients.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unsafe:Safe (1)	❍	❍	❍	❍	❍	❍	❍
Unclear:Clear (2)	❍	❍	❍	❍	❍	❍	❍
Dangerous:Not Dangerous (3)	❍	❍	❍	❍	❍	❍	❍
Causes Reaction:Does Not Cause Reaction (4)	❍	❍	❍	❍	❍	❍	❍
Definitely Will Cause Reaction:Definitely Will Not Cause Reaction (5)	❍	❍	❍	❍	❍	❍	❍
Misleading:Not Misleading (6)	❍	❍	❍	❍	❍	❍	❍

Q13 Overall, how certain are you of your attitude toward the safety of the product?

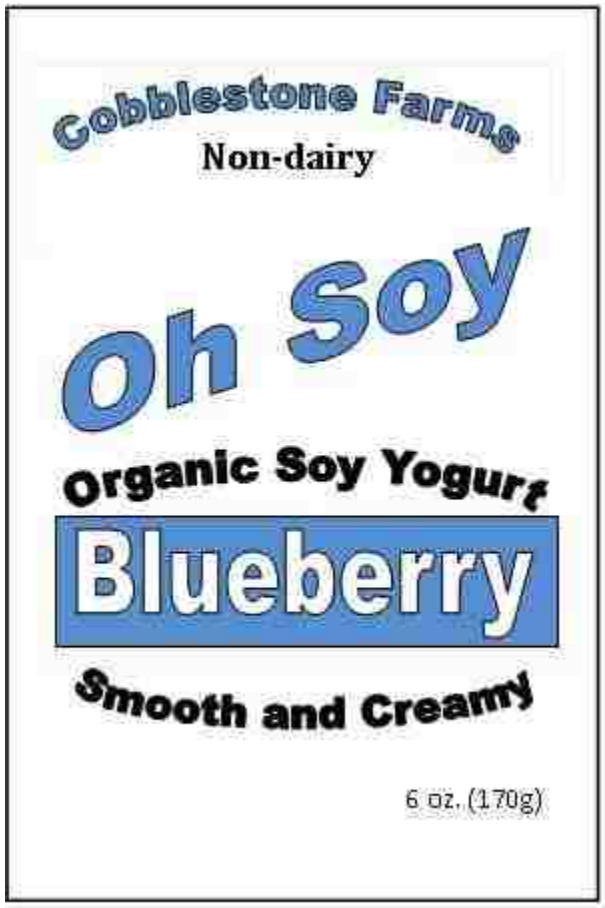
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Certain:Very Certain (1)	❍	❍	❍	❍	❍	❍	❍

Q14 How convinced are you that your overall attitude toward this product is correct?

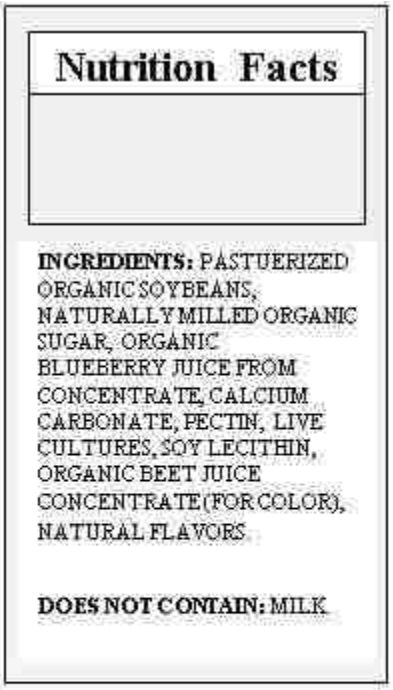
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Convinced:Very Convinced (1)	❍	❍	❍	❍	❍	❍	❍

Q15 Now suppose you pick up the product and read the Nutrition Facts Panel. Remember, It is very important that no milk or dairy ingredients be in this product. Keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q16 Please tell us your attitude towards the label:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Bad:Good (1)	❍	❍	❍	❍	❍	❍	❍
Negative:Positive (2)	❍	❍	❍	❍	❍	❍	❍
Unfavorable:Favorable (3)	❍	❍	❍	❍	❍	❍	❍

Q17 Please tell us your views towards the safety of eating this product if you are avoiding dairy/milk ingredients.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unsafe:Safe (1)	❍	❍	❍	❍	❍	❍	❍
Unclear:Clear (2)	❍	❍	❍	❍	❍	❍	❍
Dangerous:Not Dangerous (3)	❍	❍	❍	❍	❍	❍	❍
Causes Reaction:Does Not Cause Reaction (4)	❍	❍	❍	❍	❍	❍	❍
Definitely Will Cause Reaction:Definitely Will Not Cause Reaction (5)	❍	❍	❍	❍	❍	❍	❍
Misleading:Not Misleading (6)	❍	❍	❍	❍	❍	❍	❍

Q18 Overall, how certain are you of your attitude toward the safety of the product?

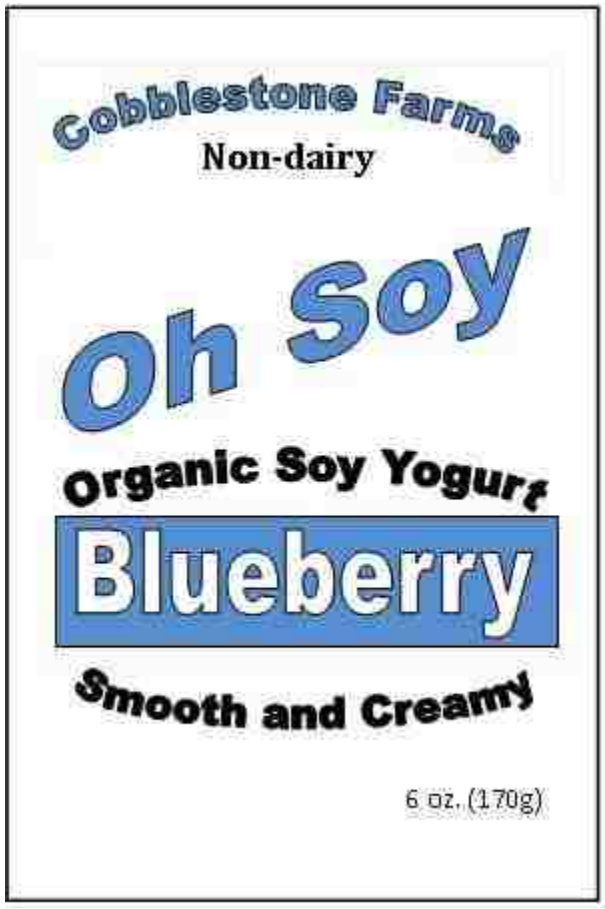
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Certain:Very Certain (1)	❍	❍	❍	❍	❍	❍	❍

Q19 How convinced are you that your overall attitude toward this product is correct?

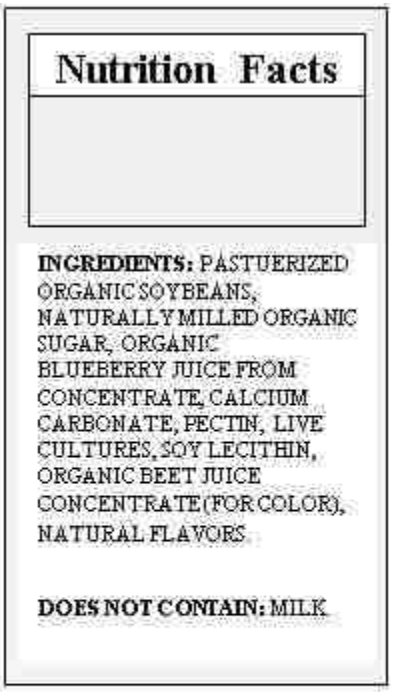
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Convinced:Very Convinced (1)	❍	❍	❍	❍	❍	❍	❍

Q20 Again, keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q21 How likely is it that this product contains dairy/milk ingredients?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unlikely:Likely (1)	❍	❍	❍	❍	❍	❍	❍

Q22 The claims on the product label are true.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q23 I believe in the claims on the product label.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q24 The product label is sincere.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q25 I think the product label is dishonest.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q26 I think the product label is deceptive.

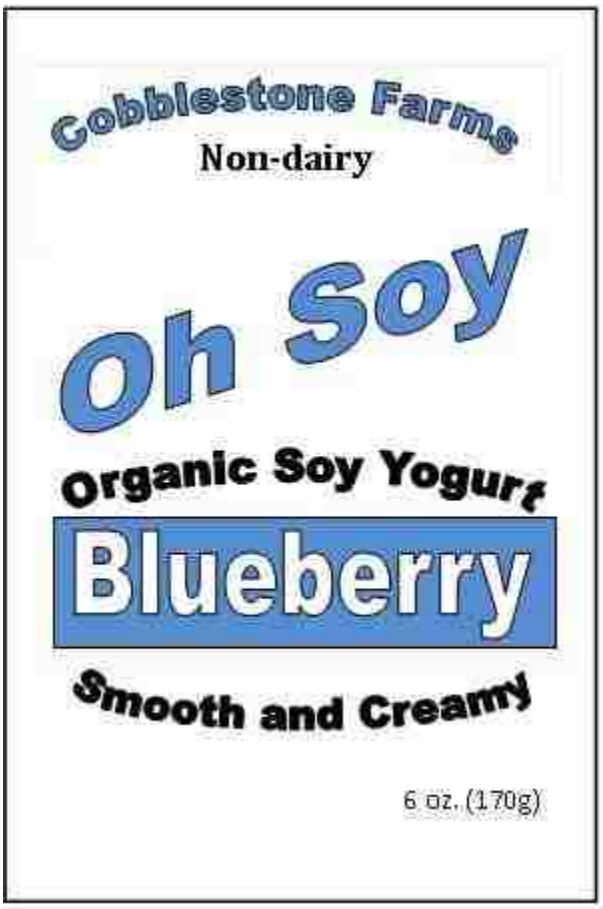
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q27 I think the product label is incorrect.

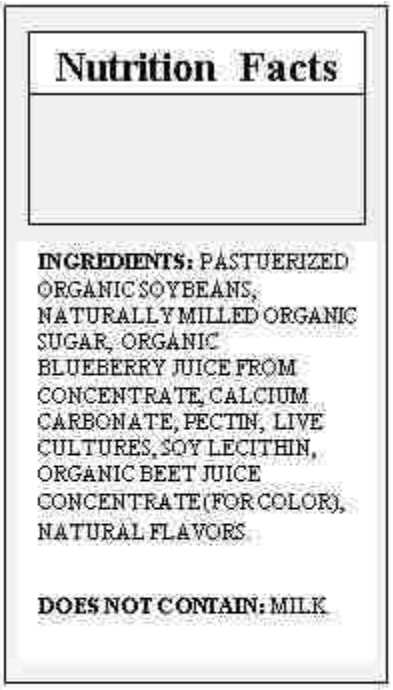
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q28 Again, keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q29 I trust the ingredient information shown on the front of this package.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q30 I trust the ingredient information shown in the Nutrition Facts Panel on the back of the package.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q31 I feel that the claims located on the Product Label are:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not Plausable:Plausable (1)	❍	❍	❍	❍	❍	❍	❍

Q32 I feel that the claims located on the Product Label are:

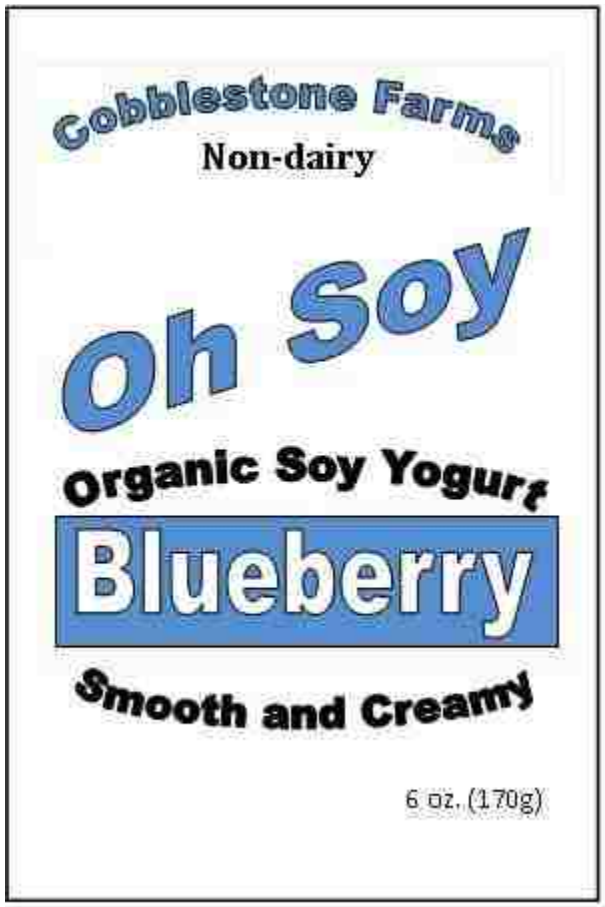
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not Credible:Credible (1)	❍	❍	❍	❍	❍	❍	❍

Q33 I feel that the claims located on the Product Label:

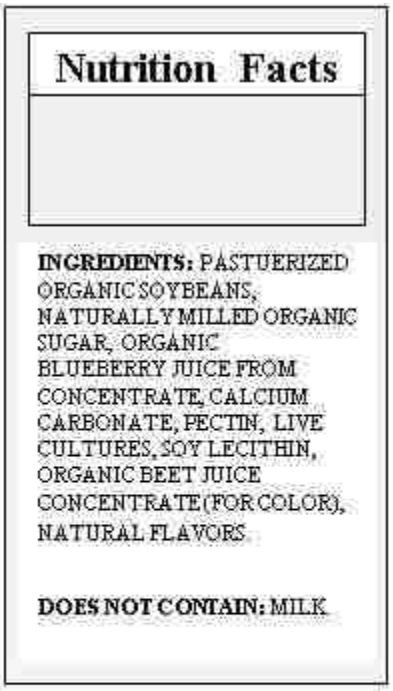
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Did Not Make Sense:Did Make Sense (1)	❍	❍	❍	❍	❍	❍	❍

Q34 Again, keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q35 The manufacturer of the product is _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Untrustworthy:Trustworthy (1)	❍	❍	❍	❍	❍	❍	❍

Q36 The manufacturer of the product is _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Incompetent:Competent (1)	❍	❍	❍	❍	❍	❍	❍

Q37 The manufacturer of the product is _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Dishonest:Honest (1)	❍	❍	❍	❍	❍	❍	❍

Q38 How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unlikely:Likely (1)	❍	❍	❍	❍	❍	❍	❍
Uncertain:Certain (2)	❍	❍	❍	❍	❍	❍	❍
Definitely Would Not:Definitely Would (3)	❍	❍	❍	❍	❍	❍	❍

Q39 The information located on the Product Label and Nutrition Facts Panel is:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Congruent:Incongruent (1)	❍	❍	❍	❍	❍	❍	❍
Expected:Not Expected (2)	❍	❍	❍	❍	❍	❍	❍
Consistent:Inconsistent (3)	❍	❍	❍	❍	❍	❍	❍

Q40 When reading and comparing the Product Label and the Nutrition Fact Panel information, I found the allergen information to be:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Easily Identified:Not Easily Identified (1)	❍	❍	❍	❍	❍	❍	❍
Properly Labeled:Improperly Labeled (2)	❍	❍	❍	❍	❍	❍	❍
Not Confusing:Confusing (3)	❍	❍	❍	❍	❍	❍	❍

Q41 I paid a lot of attention to the information that was presented to me.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All:Very Much (1)	❍	❍	❍	❍	❍	❍	❍

Q42 I thought a lot about the information and the arguments that were presented to me.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All:Very Much (1)	❍	❍	❍	❍	❍	❍	❍

Q43 Please answer the following questions by selecting the appropriate answer:

Q44 Have you purchased food products for a person suffering from food allergy in the last month?

- ❍ Yes (1)
- ❍ No (2)

Q45 Are you the primary grocery shopper in your household?

- ❍ Yes (1)
- ❍ No (2)

Q46 How frequently do you purchase groceries?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Infrequently:Frequently (1)	❍	❍	❍	❍	❍	❍	❍

Q47 I always read the product labels carefully in the store before making a purchase.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q48 What is your age

- ❍ 18-24 years old (1)
- ❍ 25-34 years old (2)
- ❍ 34-44 years old (3)
- ❍ 45-54 years old (4)
- ❍ 55-64 years old (5)
- ❍ 65-74 years old (6)
- ❍ 75 years or older (7)

Q50 What is your Ethnicity origin (or Race):

- ❍ White or Caucasian (1)
- ❍ Hispanic or Latino (2)
- ❍ Black or African American (3)
- ❍ Native American or American Indian (4)
- ❍ Asian or Pacific Islander (5)
- ❍ Other (6) _____
- ❍ Prefer not to answer (7)

Q51 Are you currently:

- ❍ Employed full time (1)
- ❍ Employed part time (2)
- ❍ Not employed (3)
- ❍ A student (4)
- ❍ Retired (5)
- ❍ Other (6) _____

Q52 Marital Status

- ❍ Married (1)
- ❍ Single (2)
- ❍ Widowed (3)
- ❍ Divorced (4)
- ❍ Partnership (5)

Q53 Number of children under the age of 18 living at home:

- ❍ 0 (1)
- ❍ 1 (2)
- ❍ 2 (3)
- ❍ 3 (4)
- ❍ 4 (5)
- ❍ 5 or more (6)

Q54 What is the highest degree or level of school you have completed:

- ❍ Less than high school (1)
- ❍ High school graduate, diploma or the equivalent (for example: GED) (2)
- ❍ Some college credit, no degree (3)
- ❍ Trade/technical/vocational training (4)
- ❍ Associate degree (5)
- ❍ Bachelor's degree (6)
- ❍ Master's degree (7)
- ❍ Professional degree (8)
- ❍ Doctorate degree (9)

Q55 I have purchased food products for person(s) allergic to (select all that apply):

- ❑ Lactose (1)
- ❑ Eggs (2)
- ❑ Peanuts (3)
- ❑ Tree Nuts (4)
- ❑ Fish (5)
- ❑ Shellfish (6)
- ❑ Soy (7)
- ❑ Wheat (8)
- ❑ Milk (9)
- ❑ Other (10) _____
- ❑ None (11)

If None Is Selected, Then Skip To End of Block

Q56 When food shopping for the food allergic person(s), please select the number of allergen(s) you must avoid:

- ❍ One food allergen (1)
- ❍ Two food allergens (2)
- ❍ Three food allergens (3)
- ❍ Four food allergens (4)
- ❍ Five food allergens (5)
- ❍ Six or more food allergens (6)

Q57 I believe lactose intolerance is a food allergy.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q58 I believe eggs are included in the dairy/milk allergy category.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q59 I believe peanuts are included in the tree nuts allergy category.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q60 When food shopping for the food allergic person, please select the preferred allergen information source used for identification of allergens contained in the food product (select one):

- ❍ Product Label (1)
- ❍ Nutrition Facts Panel (2)
- ❍ Website (3)
- ❍ Store signage (4)
- ❍ Product brochure (5)
- ❍ Mobile application (6)
- ❍ Kosher designation (7)
- ❍ Other (8) _____

Q61 When food shopping for the food allergic person(s), please select the importance of the allergen information sources used for identification of allergens contained in the food product:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Product Label (1)	❍	❍	❍	❍	❍	❍	❍
Nutrition Facts Panel (2)	❍	❍	❍	❍	❍	❍	❍
Website (3)	❍	❍	❍	❍	❍	❍	❍
Store Signage (4)	❍	❍	❍	❍	❍	❍	❍
Product Brochure (5)	❍	❍	❍	❍	❍	❍	❍
Mobile Application (6)	❍	❍	❍	❍	❍	❍	❍
Kosher Designation (7)	❍	❍	❍	❍	❍	❍	❍

Q62 Have you ever purchased a product that you thought did not contain a food allergen yet found out later that it did contain a food allergen you were trying to avoid?

- ❍ Yes (1)
- ❍ No (2)

Answer If Have you ever purchased a product that you thought did not contain a food allergen yet found out later that it did contain a food allergen you were trying to avoid? Yes Is Selected

Q63 If yes, how often does this occur?

- ❍ Never (1)
- ❍ Rarely (2)
- ❍ Sometimes (3)
- ❍ Often (4)
- ❍ Always (5)

Q64 Have you or the food allergic person been diagnosed as suffering from a food allergy by a Medical Doctor?

- ❍ Yes, every food allergic person (1)
- ❍ Yes, some food allergic person(s) (2)
- ❍ No (3)
- ❍ Unsure (4)

Q65 Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food allergy?

- ❍ Yes (1)
- ❍ No (2)
- ❍ Unsure (3)

Answer If Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Yes Is Selected Or Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Unsure Is Selected

Q66 If yes, how many times do you recall that an epinephrine auto injector (i.e. EpiPen) was used by you or the food allergic person as a result of a food allergy?

- ❍ Never (1)
- ❍ One time (2)
- ❍ Two times (3)
- ❍ Three times (4)
- ❍ Four or more times (5)
- ❍ Unsure (6)

Answer If Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Yes Is Selected Or Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Unsure Is Selected

Q67 If yes, Do you know the expiration date of the epinephrine auto injector (i.e. EpiPen) you have in your control?

- ❍ Yes (1)
- ❍ No (2)
- ❍ Unsure (3)
- ❍ Epinephrine auto injectors do not have an expiration date (4)

Q68 Please rank the following statements concerning/about food allergen labeling from most important (1) to least important (6):

_____ Food allergen labeling needs to be easily recognizable by children. (1)
_____ Food allergen labeling needs to be easily recognizable by non-allergic persons. (2)
_____ Food allergen labeling needs to be easily recognizable by non-English speaking persons. (3)
_____ Food allergen labeling needs to be included on all food product labels. (4)
_____ Food allergen labeling and definitions need to be standardized on a global basis. (5)
_____ Other- Please describe. (6)

Q69 Please rank the following statements concerning/about food allergen labeling improvements from most important (1) to least important (5):

_____ Food allergens need to be disclosed through a prominently marked allergen statement located within the Nutrition Facts Panel. (1)
_____ Food allergens need to be disclosed through a prominently marked allergen statement located on the food product label (front, back, or side of label). (2)
_____ Food allergens need to be disclosed through a prominently marked multi-lingual allergen statement. (3)
_____ Food allergens need to be disclosed through an easily recognized symbol unique to each food allergen. (4)
_____ Other- Please describe. (5)

APPENDIX F

SURVEY 4: INCONGRUENT LOW ELABORATION—CONTAINS MILK

Q49 What is your gender?

- ❍ Male (1)
- ❍ Female (2)

Q1 Do you shop for yourself or others that have a food allergy?

- ❍ Yes (1)
- ❍ No (2)

If No Is Selected, Then Skip To End of Block

Q2 Please select your relationship to the food allergic person for whom you purchase food products (select all that apply):

- ❑ Self (1)
- ❑ Spouse (2)
- ❑ Dependent child (3)
- ❑ Parent (4)
- ❑ Extended family (5)
- ❑ Friend (6)
- ❑ Other (7) _____
- ❑ None (8)

If None Is Selected, Then Skip To End of Block

Q3 Please select all category(s) you or the food allergic person(s) belongs to (select all that apply):

- ❑ Lactose intolerant- digestive discomfort that can exhibit symptoms such as bloating and/or cramping (1)
- ❑ Dairy/Milk allergy- where an allergic reaction such as trouble breathing or skin rash is triggered by dairy products (2)
- ❑ Other food allergy- whereby allergen(s) are likely to trigger an allergic reaction (3)
- ❑ I do not buy foods for persons with food allergies (4)

Q4 How many of the food allergic person(s) you shop for have issues consuming dairy/milk products?

- ❍ 0 (1)
- ❍ 1 (2)
- ❍ 2 (3)
- ❍ 3 (4)
- ❍ 4 (5)
- ❍ 5 or more (6)

Q5 How important is it to you that you know if dairy/milk ingredients are in the product you or others consume?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not Very Important:Very Important (1)	❍	❍	❍	❍	❍	❍	❍

Q6 How frequently do you purchase grocery foods?

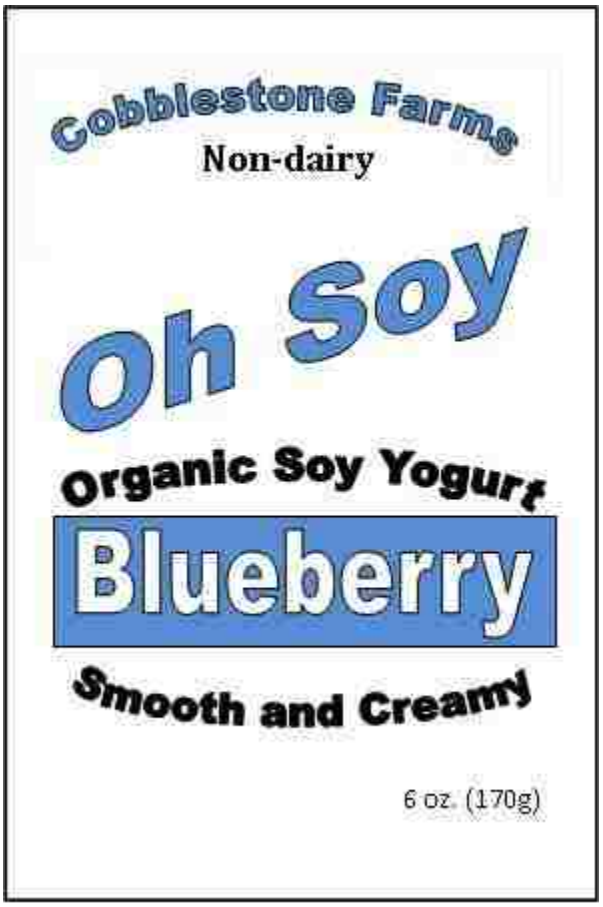
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All:Very Frequently (1)	❍	❍	❍	❍	❍	❍	❍

Q7 Please select the relationship(s) of the food allergic person(s) (select all that apply):

- ❑ Self (1)
- ❑ Spouse (2)
- ❑ Dependent Child (3)
- ❑ Parent (4)
- ❑ Extended Family (5)
- ❑ Friend (6)
- ❑ Other (7) _____

Q8 Throughout this survey, suppose you are shopping in a supermarket and purchasing food for a food allergic person allergic to dairy/milk ingredients. It is very important that no milk or dairy ingredients be in this product. Suppose you go to the store to purchase a dairy free yogurt. You see the below product label. Keeping this in mind, please answer the following questions by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



Q9 In my food shopping experience, I find this product to be personally _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Irrelevant:Relevant (1)	❍	❍	❍	❍	❍	❍	❍

Q10 How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unlikely:Likely (1)	❍	❍	❍	❍	❍	❍	❍
Uncertain:Certain (2)	❍	❍	❍	❍	❍	❍	❍
Definitely Would Not:Definitely Would (3)	❍	❍	❍	❍	❍	❍	❍

Q11 Please tell us your attitude towards the label:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Bad:Good (1)	❍	❍	❍	❍	❍	❍	❍
Negative:Positive (2)	❍	❍	❍	❍	❍	❍	❍
Unfavorable:Favorable (3)	❍	❍	❍	❍	❍	❍	❍

Q12 Please tell us your views towards the safety of eating this product if you are avoiding dairy/milk ingredients.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unsafe:Safe (1)	❍	❍	❍	❍	❍	❍	❍
Unclear:Clear (2)	❍	❍	❍	❍	❍	❍	❍
Dangerous:Not Dangerous (3)	❍	❍	❍	❍	❍	❍	❍
Causes Reaction:Does Not Cause Reaction (4)	❍	❍	❍	❍	❍	❍	❍
Definitely Will Cause Reaction:Definitely Will Not Cause Reaction (5)	❍	❍	❍	❍	❍	❍	❍
Misleading:Not Misleading (6)	❍	❍	❍	❍	❍	❍	❍

Q13 Overall, how certain are you of your attitude toward the safety of the product?

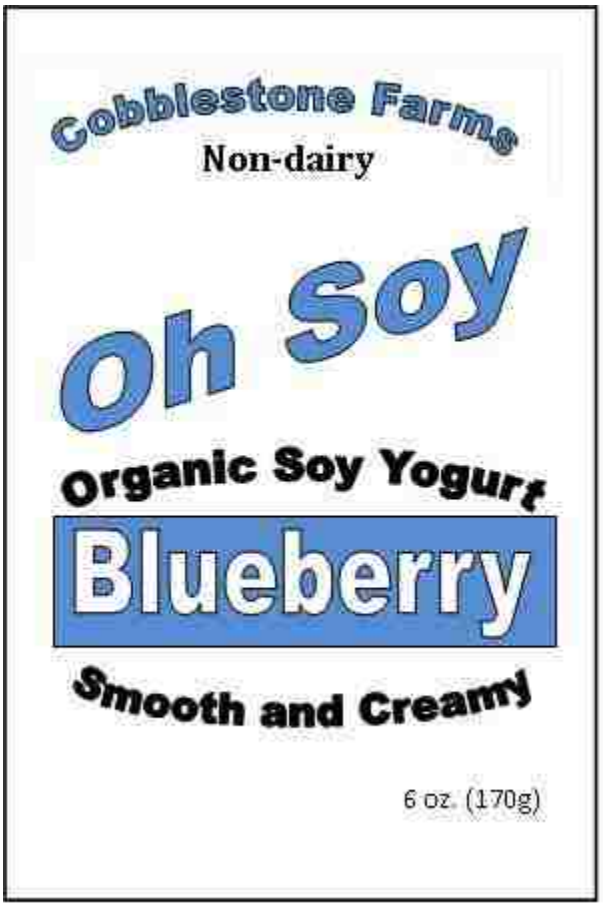
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Certain:Very Certain (1)	❍	❍	❍	❍	❍	❍	❍

Q14 How convinced are you that your overall attitude toward this product is correct?

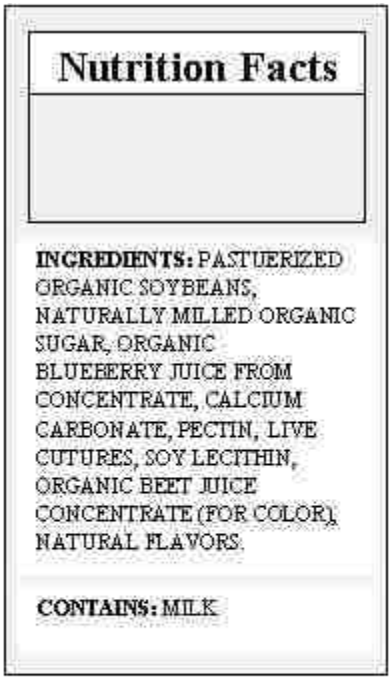
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Convinced:Very Convinced (1)	❍	❍	❍	❍	❍	❍	❍

Q15 Now suppose you pick up the product and read the Nutrition Facts Panel. Remember, It is very important that no milk or dairy ingredients be in this product. Keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q16 Please tell us your attitude towards the label:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Bad:Good (1)	❍	❍	❍	❍	❍	❍	❍
Negative:Positive (2)	❍	❍	❍	❍	❍	❍	❍
Unfavorable:Favorable (3)	❍	❍	❍	❍	❍	❍	❍

Q17 Please tell us your views towards the safety of eating this product if you are avoiding dairy/milk ingredients.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unsafe:Safe (1)	❍	❍	❍	❍	❍	❍	❍
Unclear:Clear (2)	❍	❍	❍	❍	❍	❍	❍
Dangerous:Not Dangerous (3)	❍	❍	❍	❍	❍	❍	❍
Causes Reaction:Does Not Cause Reaction (4)	❍	❍	❍	❍	❍	❍	❍
Definitely Will Cause Reaction:Definitely Will Not Cause Reaction (5)	❍	❍	❍	❍	❍	❍	❍
Misleading:Not Misleading (6)	❍	❍	❍	❍	❍	❍	❍

Q18 Overall, how certain are you of your attitude toward the safety of the product?

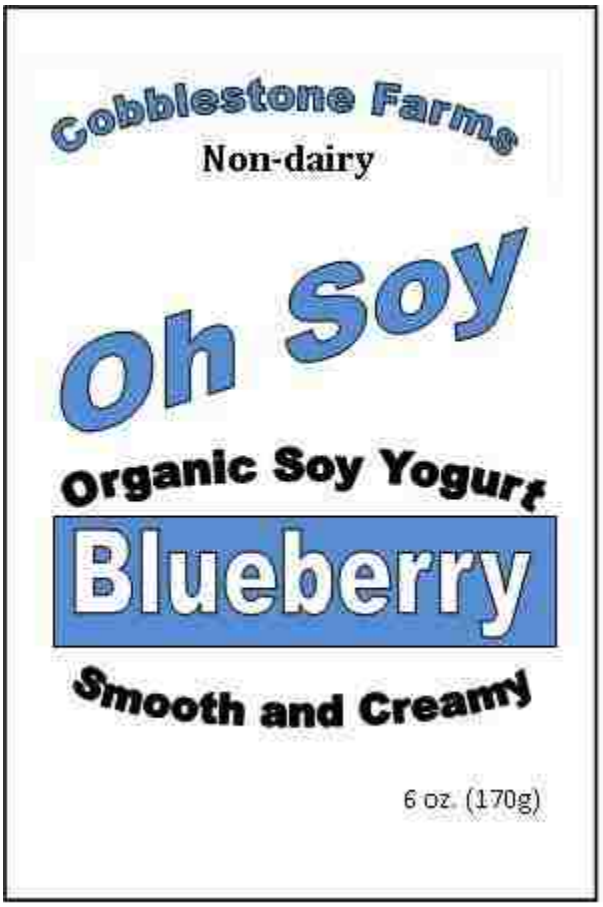
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Certain:Very Certain (1)	❍	❍	❍	❍	❍	❍	❍

Q19 How convinced are you that your overall attitude toward this product is correct?

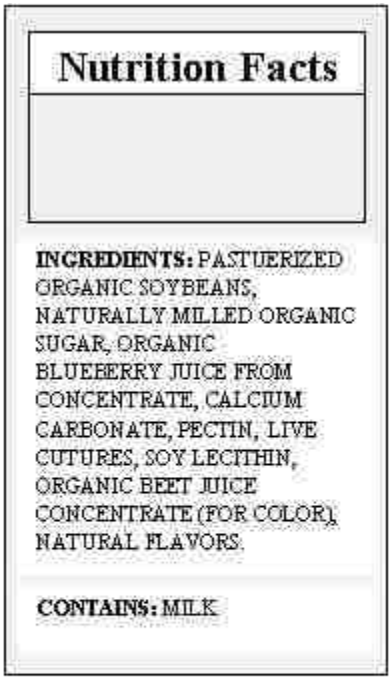
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All Convinced:Very Convinced (1)	❍	❍	❍	❍	❍	❍	❍

Q20 Again, keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q21 How likely is it that this product contains dairy/milk ingredients?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unlikely:Likely (1)	❍	❍	❍	❍	❍	❍	❍

Q22 The claims on the product label are true.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q23 I believe in the claims on the product label.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q24 The product label is sincere.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q25 I think the product label is dishonest.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q26 I think the product label is deceptive.

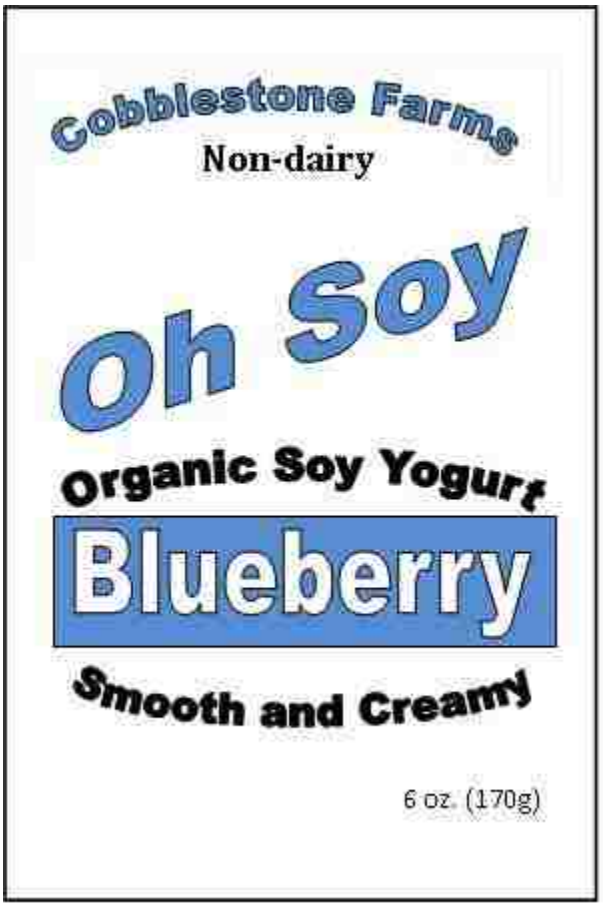
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q27 I think the product label is incorrect.

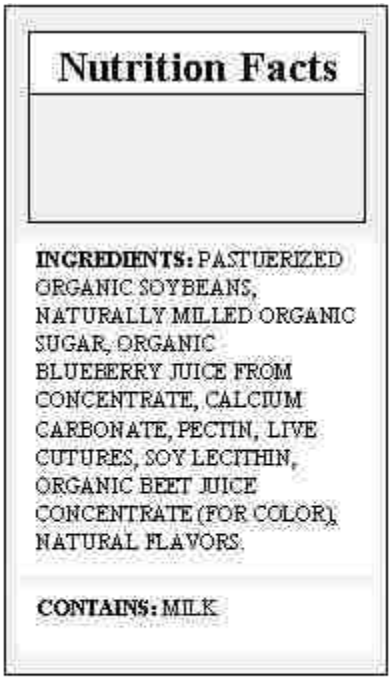
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Disagree:Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q28 Again, keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q29 I trust the ingredient information shown on the front of this package.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q30 I trust the ingredient information shown in the Nutrition Facts Panel on the back of the package.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q31 I feel that the claims located on the Product Label are:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not Plausable:Plausable (1)	❍	❍	❍	❍	❍	❍	❍

Q32 I feel that the claims located on the Product Label are:

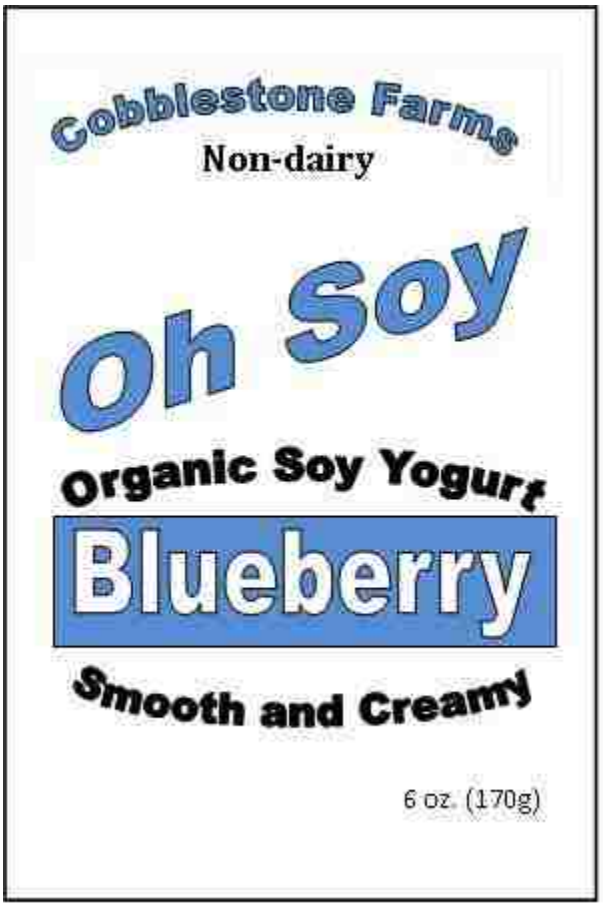
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not Credible:Credible (1)	❍	❍	❍	❍	❍	❍	❍

Q33 I feel that the claims located on the Product Label:

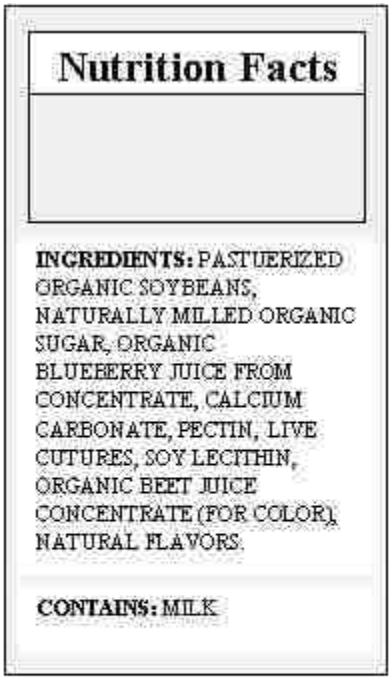
	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Did Not Make Sense:Did Make Sense (1)	❍	❍	❍	❍	❍	❍	❍

Q34 Again, keeping in mind both the Product Label and Nutrition Facts Panel information, please answer the questions below by selecting one number on each of the following scales that best represents the way you feel about it.

(Product Label)



(Nutrition Facts Panel)



Q35 The manufacturer of the product is _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Untrustworthy:Trustworthy (1)	❍	❍	❍	❍	❍	❍	❍

Q36 The manufacturer of the product is _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Incompetent:Competent (1)	❍	❍	❍	❍	❍	❍	❍

Q37 The manufacturer of the product is _____.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Dishonest:Honest (1)	❍	❍	❍	❍	❍	❍	❍

Q38 How likely is it that you will purchase this product if you are avoiding dairy/milk ingredients:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Unlikely:Likely (1)	❍	❍	❍	❍	❍	❍	❍
Uncertain:Certain (2)	❍	❍	❍	❍	❍	❍	❍
Definitely Would Not:Definitely Would (3)	❍	❍	❍	❍	❍	❍	❍

Q39 The information located on the Product Label and Nutrition Facts Panel is:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Congruent:Incongruent (1)	❍	❍	❍	❍	❍	❍	❍
Expected:Not Expected (2)	❍	❍	❍	❍	❍	❍	❍
Consistent:Inconsistent (3)	❍	❍	❍	❍	❍	❍	❍

Q40 When reading and comparing the Product Label and the Nutrition Fact Panel information, I found the allergen information to be:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Easily Identified:Not Easily Identified (1)	❍	❍	❍	❍	❍	❍	❍
Properly Labeled:Improperly Labeled (2)	❍	❍	❍	❍	❍	❍	❍
Not Confusing:Confusing (3)	❍	❍	❍	❍	❍	❍	❍

Q41 I paid a lot of attention to the information that was presented to me.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All:Very Much (1)	❍	❍	❍	❍	❍	❍	❍

Q42 I though a lot about the information and the arguments that were presented to me.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Not At All:Very Much (1)	❍	❍	❍	❍	❍	❍	❍

Q43 Please answer the following questions by selecting the appropriate answer:

Q44 Have you purchased food products for a person suffering from food allergy in the last month?

- ❍ Yes (1)
- ❍ No (2)

Q45 Are you the primary grocery shopper in your household?

- ❍ Yes (1)
- ❍ No (2)

Q46 How frequently do you purchase groceries?

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Infrequently:Frequently (1)	❍	❍	❍	❍	❍	❍	❍

Q47 I always read the product labels carefully in the store before making a purchase.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q48 What is your age

- ❍ 18-24 years old (1)
- ❍ 25-34 years old (2)
- ❍ 34-44 years old (3)
- ❍ 45-54 years old (4)
- ❍ 55-64 years old (5)
- ❍ 65-74 years old (6)
- ❍ 75 years or older (7)

Q50 What is your Ethnicity origin (or Race):

- White or Caucasian (1)
- Hispanic or Latino (2)
- Black or African American (3)
- Native American or American Indian (4)
- Asian or Pacific Islander (5)
- Other (6) _____
- Prefer not to answer (7)

Q51 Are you currently:

- Employed full time (1)
- Employed part time (2)
- Not employed (3)
- A student (4)
- Retired (5)
- Other (6) _____

Q52 Marital Status

- Married (1)
- Single (2)
- Widowed (3)
- Divorced (4)
- Partnership (5)

Q53 Number of children under the age of 18 living at home:

- 0 (1)
- 1 (2)
- 2 (3)
- 3 (4)
- 4 (5)
- 5 or more (6)

Q54 What is the highest degree or level of school you have completed:

- ❍ Less than high school (1)
- ❍ High school graduate, diploma or the equivalent (for example: GED) (2)
- ❍ Some college credit, no degree (3)
- ❍ Trade/technical/vocational training (4)
- ❍ Associate degree (5)
- ❍ Bachelor's degree (6)
- ❍ Master's degree (7)
- ❍ Professional degree (8)
- ❍ Doctorate degree (9)

Q55 I have purchased food products for person(s) allergic to (select all that apply):

- ❑ Lactose (1)
- ❑ Eggs (2)
- ❑ Peanuts (3)
- ❑ Tree Nuts (4)
- ❑ Fish (5)
- ❑ Shellfish (6)
- ❑ Soy (7)
- ❑ Wheat (8)
- ❑ Milk (9)
- ❑ Other (10) _____
- ❑ None (11)

If None Is Selected, Then Skip To End of Block

Q56 When food shopping for the food allergic person(s), please select the number of allergen(s) you must avoid:

- ❍ One food allergen (1)
- ❍ Two food allergens (2)
- ❍ Three food allergens (3)
- ❍ Four food allergens (4)
- ❍ Five food allergens (5)
- ❍ Six or more food allergens (6)

Q57 I believe lactose intolerance is a food allergy.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q58 I believe eggs are included in the dairy/milk allergy category.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q59 I believe peanuts are included in the tree nuts allergy category.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Strongly Disagree:Strongly Agree (1)	❍	❍	❍	❍	❍	❍	❍

Q60 When food shopping for the food allergic person, please select the preferred allergen information source used for identification of allergens contained in the food product (select one):

- ❍ Product Label (1)
- ❍ Nutrition Facts Panel (2)
- ❍ Website (3)
- ❍ Store signage (4)
- ❍ Product brochure (5)
- ❍ Mobile application (6)
- ❍ Kosher designation (7)
- ❍ Other (8) _____

Q61 When food shopping for the food allergic person(s), please select the importance of the allergen information sources used for identification of allergens contained in the food product:

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)
Product Label (1)	❍	❍	❍	❍	❍	❍	❍
Nutrition Facts Panel (2)	❍	❍	❍	❍	❍	❍	❍
Website (3)	❍	❍	❍	❍	❍	❍	❍
Store Signage (4)	❍	❍	❍	❍	❍	❍	❍
Product Brochure (5)	❍	❍	❍	❍	❍	❍	❍
Mobile Application (6)	❍	❍	❍	❍	❍	❍	❍
Kosher Designation (7)	❍	❍	❍	❍	❍	❍	❍

Q62 Have you ever purchased a product that you thought did not contain a food allergen yet found out later that it did contain a food allergen you were trying to avoid?

❍ Yes (1)
❍ No (2)

Answer If Have you ever purchased a product that you thought did not contain a food allergen yet found out later that it did contain a food allergen you were trying to avoid? Yes Is Selected

Q63 If yes, how often does this occur?

❍ Never (1)
❍ Rarely (2)
❍ Sometimes (3)
❍ Often (4)
❍ Always (5)

Q64 Have you or the food allergic person been diagnosed as suffering from a food allergy by a Medical Doctor?

- ❍ Yes, every food allergic person (1)
- ❍ Yes, some food allergic person(s) (2)
- ❍ No (3)
- ❍ Unsure (4)

Q65 Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food allergy?

- ❍ Yes (1)
- ❍ No (2)
- ❍ Unsure (3)

Answer If Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Yes Is Selected Or Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Unsure Is Selected

Q66 If yes, how many times do you recall that an epinephrine auto injector (i.e. EpiPen) was used by you or the food allergic person as a result of a food allergy?

- ❍ Never (1)
- ❍ One time (2)
- ❍ Two times (3)
- ❍ Three times (4)
- ❍ Four or more times (5)
- ❍ Unsure (6)

Answer If Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Yes Is Selected Or Do you or the food allergic person carry an epinephrine auto injector (i.e. EpiPen) for your food... Unsure Is Selected

Q67 If yes, Do you know the expiration date of the epinephrine auto injector (i.e. EpiPen) you have in your control?

- ❍ Yes (1)
- ❍ No (2)
- ❍ Unsure (3)
- ❍ Epinephrine auto injectors do not have an expiration date (4)

Q68 Please rank the following statements concerning/about food allergen labeling from most important (1) to least important (6):

_____ Food allergen labeling needs to be easily recognizable by children. (1)
_____ Food allergen labeling needs to be easily recognizable by non-allergic persons. (2)
_____ Food allergen labeling needs to be easily recognizable by non-English speaking persons. (3)
_____ Food allergen labeling needs to be included on all food product labels. (4)
_____ Food allergen labeling and definitions need to be standardized on a global basis. (5)
_____ Other- Please describe. (6)

Q69 Please rank the following statements concerning/about food allergen labeling improvements from most important (1) to least important (5):

_____ Food allergens need to be disclosed through a prominently marked allergen statement located within the Nutrition Facts Panel. (1)
_____ Food allergens need to be disclosed through a prominently marked allergen statement located on the food product label (front, back, or side of label). (2)
_____ Food allergens need to be disclosed through a prominently marked multi-lingual allergen statement. (3)
_____ Food allergens need to be disclosed through an easily recognized symbol unique to each food allergen. (4)
_____ Other- Please describe. (5)

REFERENCES

Agency, F. S. (2014). *Food allergen labeling*. Retrieved from https://www.food.gov.uk/science/allergy-intolerance/label.

American Academy of Allergy Asthma & Immunology. (AAAAI). (2011a). *Allergic reactions*. Retrieved from https://www.aaaai.org/conditions-and-treatments/library/at-a-glance/allergic-reactions.

American Academy of Allergy Asthma & Immunology. (AAAAI).(2011b). *Allergy statistics*. Retrieved from http://www.aaaai.org/about-the-aaaai/newsroom/allergy-statistics.aspx

American Academy of Allergy Asthma & Immunology. (AAAAI). (2011c). *Food allergy versus food intolerance.* Retrieved from http://www.aaaai.org/Aaaai/media/ MediaLibrary/ PDF%20Documents/Libraries/EL-food-allergies-vs-intolerance-patient.pdf

American Academy of Allergy Asthma & Immunology. (AAAAI). (2011d). *Food allergy: Tips to remember.* Retrieved from http://www.aaaai.org/conditions-and-treatments/library/at-a-glance/food-allergy.aspx

American Academy of Allergy Asthma & Immunology. (AAAAI). (2011e). *Anaphylaxis.* Retrieved from https://www.aaaai.org/conditions-and-treatments/library/allergy-library/anaphylaxis

American Academy of Allergy Asthma & Immunology. (AAAAI). (2012). *Food allergy: Treatment and management.* Retrieved from http://www.aaaai.org/conditions-and-treatments/allergies/food-allergies.aspx

Annunziata, A., Pomarici, E., Vecchio, R., & Mariani, A. (2016). Nutritional information and health warnings on wine labels: Exploring consumer interest and preferences. *Appetite, 30,* 1-12. doi:10.1016/j.appet.2016.02.152

Asthma and Allergy Foundation of America**.** (AAAAI). (2011). *Allergy facts and figures.* Retrieved from http://www.aafa.org/display.cfm?id=9&sub=30

Barnett, J., Leftwich, J., Muncer, K., Grimshaw, K., Shepherd, R., Raats, M. M., . . . Lucas, J. S. (2011). 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., Gowland, M. H., . . . Lucas, J. (2011). Using "may contain" labelling to inform food choice: A qualitative study of nut-allergic consumers. *BMC Public Health, 11*(1), 734-743. doi:10.1186/1471-2458-11-734

Benn, Y., Webb, T. L., Chang, B.P.I., & Reidy, J. (2015). What information do consumers consider, and how do they look for it, when shopping for groceries online? *Appetite, 89*, 265-273. doi:10.1016/j.appet.2015.01.025

Buhl, T., Kampmann, H., Martinez, J., & Fuchs, T. (2008). The European Labelling Law for Foodstuffs contains life-threatening exemptions for food-allergic consumers. *International Archives of Allergy and Immunology, 146*(4), 334-337.

Chin, W. W. (Ed.). (1998). *Modern methods for business research*. London, England: Lawrence Erlbaum Associates.

Cornelisse-Vermaat, J. R., Voordouw, J., Yiakoumaki, V., Theodoridis, G., & Frewer, L. J. (2008). Food-allergic consumers' labelling preferences: A cross-cultural comparison. *European Journal of Public Health, 18*(2), 115-120. doi: 10.1093/eurpub/ckm032

Crevel, R. (2001). Risk assessment for food allergy: The industry viewpoint. *Allergy, 56*, 94-97. doi:10.1034/j.1398-9995.2001.00928.x

Crevel, R. (2002). Industrial dimensions of food allergy. *Biochemical Society Transactions, 30*(6), 941-944. doi:10.1042/bst0300941

Crevel, R., Ballmer-Weber, B. K., Holzhauser, T., Hourihane, J. O. B., Knulst, A. C., Mackie, A. R., . . . Taylor, S. L. (2008). Thresholds for food allergens and their value to different stakeholders. *Allergy, 63*(5), 597-609. doi:10.1111/j.1398-9995.2008.01636.x

Ducrot, P., Julia, C., Méjean, C., Kesse-Guyot, E., Touvier, M., Fezeu, L. K., . . . Péneau, S. (2016). Impact of different front-of-pack nutrition labels on consumer purchasing intentions: A randomized controlled trial. *American Journal of Preventive Medicine, 50*(5), 627-636. doi:http://dx.doi.org/10.1016/j.amepre.2015.10.020

Fenko, A., Kersten, L., & Bialkova, S. (2016). Overcoming consumer scepticism toward food labels: The role of multisensory experience. *Food Quality and Preference, 48*, 81-92. doi:10.1016/j.foodqual.2015.08.013

Frewer, L. J., Howard, C., Hedderley, D., & Shepherd, R. (1997). The Elaboration Likelihood Model and communication about food risks. *Risk Analysis, 17*(6), 759-770. doi:10.1111/j.1539-6924.1997.tb01281.x

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.

GoDairyFree. (2012). *The guide and cookbook for milk allergies, l. i.,<<?**?** and casein-free living.* Retrieved from http://www.godairyfree.org/dairy-free-grocery-shopping-guide/dairy-ingredient-list-2

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing Theory and Practice, 19*(2), 139-152.

Hammond, D., Fong, G. T., McDonald, P. W., Brown, S., & Cameron, R. (2004). Graphic Canadian cigarette warning labels and adverse outcomes: Evidence from Canadian smokers. *American Journal of Public Health, 94*(8), 1442-1445.

Hunt, S. D. (2002). *Foundations of marketing theory: Toward a general theory of marketing*. Armonk, NY: M. E. Sharpe.

Irmak, C., Vallen, B., & Rosen Robinson, S. (2011). The impact of product name on dieters' and nodieters' food evaluations and consumption. *Journal of Consumer Research, 38*(2), 390-405. doi:10.1086/660044

Kachigan, S. K. (1986). *Statistical analysis: An interdisciplinary introduction to univariate and multivariate methods*. New York, NY: Radius Press.

Keller, S. B., Landry, M., Olson, J., Velliquette, A. M., Burton, S., & Andrews, J. C. (1997). The effects of nutrition package claims, nutrition facts panels, and motivation to process nutrition information on consumer product evaluations. *Journal of Public Policy & Marketing, 16*(2), 256-269.

Kent, R. J., & Allen, C. T. (1994). Competitive interference effects in consumer memory for advertising: The role of brand familiarity. *Jouronal of Marketing*, *58*(3), 97-105.

Laroche, M., Kim, C., & Zhou, L. (1996). Brand familiarity and confidence as determinants of purchase intention: An empirical test in a multiple brand context. *Journal of Business Research, 37*(2), 115-120. doi:10.1016/0148-2963(96)00056-2

Lavrakas, P. J. (Ed.). (2008). *Encyclopedia of survey research methods* (1st ed.). Thousand Oaks, CA: Sage.

Lietz, P. (2010). Research into questionnaire design. *International Journal of Market Research, 52*(2), 249-272.

Malhorta, N., K. (2010). *Marketing research: An applied orientation* (6th ed.). Upper Saddle River, NJ: Pearson Education.

Marchisotto, M. J., Harada, L., Blumenstock, J. A., Bilaver, L. A., Waserman, S., Sicherer, S., . . . Gupta, R. S. (2016). Global perceptions of food allergy thresholds in 16 countries. *European Journal of Allergy and Clinical Immunology, 71*(8), 1081-1085. doi:10.1111/all.12933

Mhurchu, C. N., & Gorton, D. (2007). Nutrition labels and claims in New Zealand and Australia: A review of use and understanding. *Australian and New Zealand Journal of Public Health, 31*(2), 105-112. doi:10.1111/j.1753-6405.2007.00026.x

Miles, S., Bolhaar, S., González-Mancebo, E., Hafner, C., Hoffmann-Sommergruber, K., Fernández-Rivas, M., & Knulst, A. (2005). Attitudes towards low-allergen food in food allergic consumers. *Nutrition and Food Science, 35*(4), 220-228. doi: 10.1108/00346650510605612

Miles, S., Fordham, R., Mills, C., Valovirta, E., & Mugford, M. (2005). A framework for measuring costs to society of IgE-mediated food allergy. *Allergy, 60*(8), 996-1003. doi:10.1111/j.1398-9995.2005.00868.x

Miles, S., Valovirta, E., & Frewer, L. (2006). Communication needs and food allergy: A summary of stakeholder views. *British Food Journal, 108*(9), 795-802. doi: 10.1108/00070700610688412

Mills, E.N.C., Mackie, A. R., Burney, P., Beyer, K., Frewer, L., Madsen, C., . . . Van Ree, R. (2007). The prevalence, cost and basis of food allergy across Europe. *Allergy, 62*(7), 717-722. doi:10.1111/j.1398-9995.2007.01425.x

Mills, E.N.C., Valovirta, E., Madsen, C., Taylor, S. L., Vieths, S., Anklam, E., . . . Frewer, L. (2004). Information provision for allergic consumers: Where are we going with food allergen labelling? *Allergy, 59*(12), 1262-1268. doi: 10.1111/j.1398-9995.2004.00720.x

Moorman, C. (1990). The effects of stimulus and consumer characteristics on the utilization of nutrition information. *Journal of Consumer Research, 17*(3), 362-374.

Morgan, R. M., & Hunt, S. D. (1994). The commitment-trust theory of relationship marketing. *Journal of Marketing, 58*(3), 20-38.

Munoz, Y., Chebat, J.-C., & Suissa, J. A. (2010). Using fear appeals in warning labels to promote responsible gambling among VLT players: The key role of depth of information processing. *Journal of Gambling Studies, 26*(4), 593-609. doi: http://dx.doi.org/10.1007/s10899-010-9182-4

Strom, S. (2016, February 3). Chipolte food-safety issues drage down profits. *New York Times Online,* p. B-2. Retrieved from http://www.nytimes.com/2016/02/03/business/chipotle-food-safety-illness-investigation-earnings.html?_r=0

Nunnally, J. (1978). *Psychometric theory* (2nd ed.). New York, NY: McGraw-Hill.

Putrevu, S., & Lord. K. R. (1994). Comparative and noncomparative advertising: Attitudinal effects under cognitive and affective involvement conditions, *Journal of Advertising, 23*(2), 77-91.

Roe, B., Levy, A. S., & Derby, B. M. (1999). The impact of health claims on consumer search and product evaluation outcomes: Results from FDA experimental data. *Journal of Public Policy & Marketing, 18*(1). 89105.

Rucker, D. D., & Petty, R. E. (2006). Increasing the effectiveness of communications to consumers: Recommendations based on elaboration likelihood and attitude certainty perspectives. *Journal of Public Policy & Marketing, 25*(1), 39-52.

Ruth, M.W.Y., & Morris, J. (2001). Food safety risk Consumer perception and purchase behaviour. *British Food Journal, 103*(3), 170-186.

Sakellariou, A., Sinaniotis, A., Damianidou, L., Papadopoulos, N. G., & Vassilopoulou, E. (2010). Food allergen labelling and consumer confusion. *Allergy, 65*(4), 534-535. doi:10.1111/j.1398-9995.2009.02209.x

Sansgiry, S. S., & Cady, P. S. (1997). An investigative model evaluating how consumers process pictorial information on nonprescription medication labels. *Health Marketing Quarterly, 14*(4), 71-90.

Siet, S., Linnemann, A., Gé, B., Jongen, W., Ton van, G., & Dagevos, H. (2007). Exploration of projective techniques to unravel health perception. *British Food Journal, 109*(6), 443-456. doi:http://dx.doi.org/10.1108/00070700710753508

Simons, E., Weiss, C. C., Furlong, T. J., & Sicherer, S. H. (2005). Impact of ingredient labeling practices on food allergic consumers. *Annals of Allergy, Asthma & Immunology, 95*(5), 426-428. doi:10.1016/s1081-1206(10)61166-0

Stonyfield Farms. (2011). *Product nutrition FAQs.* Retrieved from http://www.stonyfield.com/healthy-people/product-nutrition-faqs

Stonyfield Farms. (2014). *Frequently asked questions.* Retrieved from http://www.stonyfield.com/faqs

Taylor, S. L., & Hefle, S. L. (2001). Ingredient and labeling issues associated with allergenic foods. *Allergy, 56,* 64-69. doi:10.1034/j.1398-9995.2001.00920.x

Tonkin, E., Meyer, S. B., Coveney, J., Webb , T., & Wilson, A. M. (2016). The process of making trust related judgements through interaction with food labelling. *Food Policy, 63,* 1-11. doi:10.1016/j.foodpol.2016.06.007

Tonkin, E., Webb , T., Coveney, J., Meyer, S. B., & Wilson, A. M. (2016). Consumer trust in the Australian food system: The everyday erosive impact of food labelling. *Appetite, 103,* 118-127. doi:10.1016/j.appet.2016.04.004

Tonkin, E., Wilson, A. M., Coveney, J., Webb , T., & Meyer, S. B. (2015). Trust in and through labelling: A systematic review and critique. *British Food Journal, 117*(1), 318-338. doi:10.1108/BFJ-07-2014-0244

Tormala, Z. L., & Petty, R. E. (2004). Source credibility and attitude certainty: A metacognitive analysis of resistance to persuasion. *Journal of Consumer Psychology, 14*(4), 427-442.

Um, N. H. (2008). Revisit elaboration likelihood model: How advertising appeals work on attitudinal and behavioral brand loyalty centering around low vs. high-involvement product. *European Journal of Social Sciences, 7*(1), 126-139.

United States Department of Health and Human Services. (USDHHS). (2006). *Guidance for industry: Questions and answers regarding food allergens, including the Food Allergen Labeling and Consumer Protection Act of 2004 (Edition 4); Final guidance*. Retrieved from http://www.fda.gov/Food/GuidanceRegulation/ GuidanceDocumentsRegulatoryInformation/Allergens/ucm059116.htm.

United States Department of Health and Human Services. (USDHHS). (2009a). *Guidance for industry: A food labeling guide*. Retrieved from http://www.fda.gov/food/guidanceregulation/guidancedocumentsregulatoryinformation/labelingnutrition/ucm064880.htm.

United States Department of Health and Human Services. (USDHHS).(2009b). *Problems digesting dairy products?* Retrieved from http://www.fda.gov/ForConsumers/ ConsumerUpdates/ ucm337628.htm.

United States Department of Health and Human Services. (USDHHS). (2010). *What does the FDA do?* Retrieved from http://www.fda.gov/AboutFDA/ Transparency/Basics/ucm194877.htm.

United States Department of Health and Human Services. (USDHHS).(2013). *What is gluten-free? FDA has an answer*. Retrieved from http://www.fda.gov/ ForConsumers/ConsumerUpdates/ ucm363069.htm.

United States Equal Employment Opportunity Commission. (2002). *American with Disabilities Act: Questions and answers*. Retrieved from http://www.ada.gov/qandaeng.htm.

Van Steenburg, E. (2012). Consumer recall of brand versus product banner ads. *Journal of Product and Brand Management, 21*(6), 452-464. doi: http://dx.doi.org/10.1108/10610421211264937

Verrill, L., & Choinere, C. J. (2009). Are food allergen advisory statements really warnings? Variation in consumer preferences and consumption decisions. *Journal of Food Products Marketing, 15*(2), 139-151. doi:10.1080/10454440802316800

Voordouw, J., Antonides, G., Cornelisse-Vermaat, J. R., Pfaff, S., Niemietz, D., & Frewer, L. J. (2012). Optimising the delivery of food allergy information: An assessment of food allergic consumer preferences for different information delivery formats. *Food Quality and Preference, 23*(1), 71-78. doi: 10.1016/j.foodqual.2011.08.001

Wilson, A. M., Meyer, S. B., Webb , T., Henderson, J., Coveney, J., McCullum, D., & Ward, P. R. (2015). How food regulators communicate with consumers about food safety. *British Food Journal, 117*(8), 2129-2142. doi:10.1108/BFJ-12-2014-0419