1-1-2015

Parental Attitudes, Concerns, Health & Knowledge of Nutrition and Their Relationship to Usage of Functional Foods in Parental Feeding

Lauren Elizabeth Guy
University of Mississippi

PARENTAL ATTITUDES, CONCERNS, HEALTH AND KNOWLEDGE OF NUTRITION AND THEIR RELATIONSHIP TO USAGE OF FUNCTIONAL FOODS IN PARENTAL FEEDING

A Thesis
presented in partial fulfillment of requirements
for the degree Master of Science
in the Department of Nutrition and Hospitality Management
The University of Mississippi

by

Lauren E. Guy

May 2015

ABSTRACT

The purchase and consumption of functional foods is one of the fastest growing trends in the food and nutrition industry. Though many studies have suggested reasons why consumers purchase and consume functional foods, there has been limited research to understand what factors, if any, influence the use of functional foods in parental dietary practices. Therefore, the purpose of this study was to determine whether parental awareness of functional foods, self-reported knowledge of nutrition, overall health, and concern for their children's diets play a role in the provision of specific categories of functional foods (digestive health, weight management, bone health, cancer prevention, heart health, and other) to their children. Participants (n=202) were parents/guardians 18 years of age or older with (a) child(ren) 18 years of age or younger currently living in their home. Parents/guardians were recruited from two schools districts in North Mississippi (Tupelo Public School District and Lafayette County School District) to complete an online or paper survey regarding functional foods and factors that influence their usage in the home. Upon analysis, results of the survey demonstrated that of the variables considered, parental knowledge of nutrition was a statistically significant predictor of parental feeding in all categories of functional foods ($p<0.01$), with the exception of bone health. No other independent variables were found to be significant predictors of provision of functional foods to children by their parents. To date, there has been minimal research on usage of functional foods in parental dietary practices. As the term "functional food" becomes more widely recognized, some of the factors considered in this study may become a more significant influence of functional food usage in parental dietary practices.

ACKNOWLEDGEMENTS

I would like to extend a thank you to my colleagues who assisted me in research, Jordyn Thornton, Olivia DeLeon, and Peter Weiss. I would also acknowledge my thesis committee, Dr. David Joung, Dr. Yunhee Chang, along with a large thanks to my advisor, Dr. Mary Roseman. Thank you all for your support, patience, and encouragement over the past two years of graduate school, as well as while working on this research. Without any of you, this thesis would not have been possible.

Additionally, I would like to acknowledge Tupelo Public School District and Lafayette County School District for allowing us to recruit parents of students at these schools as participants in this study.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER I. INTRODUCTION

Introduction

Food is essential for the proper growth and development of any individual. In recent years, much interest has developed around the idea of consuming more functional foods to aid in growth and development. According to the International Food Information Council (IFIC) (2009) and the Academy of Nutrition and Dietetics (AND) (2013), functional foods are defined as "wide variety of foods and food components believed to improve overall health and well-being, reduce the risk of specific diseases, or minimize the effects of other health concerns." In a survey conducted in 2013, IFIC (2013) found that 90% of consumers agree that certain foods provide benefits beyond basic nutrition, but the same consumers expressed concern about health problems resulting from a general nutrient inadequacy.

The definition of health has evolved in recent years. Previously thought of as "absence of disease," health is also referred to as the optimization of physical and mental well being (Ross, 2000). Functional foods provide consumers not only with protection against specific diseases, but also with a focus on the improvement of overall health (Ross, 2000). With a continuously increasing interest in the role that food plays in the health of the body and prevention of specific diseases, the consumption and acceptance of functional foods is likely to continue to increase. Prior to 1995, the food industry set its focus on the subtraction of ingredients or food substances that science believed to cause harm to the body, or that were deemed as unhealthy in order to make foods healthier and safer for consumption (AND, 2013). Since the introduction of functional foods to the United States in the early 1990s, a shift in focus from subtracting

ingredients to adding beneficial ingredients to optimize health in Americans has occurred (AND, 2013).

Consumers agree that functional foods may have great benefit for individuals belonging in specific subpopulations, such as children (IFIC, 2013). Though consumers believe that functional foods may have great benefit among children experiencing various types of health problems, there has been minimal research conducted to determine whether or not parents provide their children with functional foods, and specifically, whether they provide their children functional foods to maintain their general health and nutrition. Therefore, four objectives of this study were to determine parental level of belief that certain foods provide health benefits beyond basic nutrition, parental level of nutrition knowledge, parental level of overall health, and parental level of concern related to their children's eating habits. An additional objective sought to determine whether or not these parental beliefs and concerns toward and knowledge of health and nutrition, along with overall health, correspond with parents feeding their children functional foods for health conditions. Research questions used to test these objectives include:

- Is there an association between a parents' degree of belief that certain foods provide health benefits beyond basic nutrition and the types of functional foods their children are fed for specific health conditions?
- Is there an association between a parents' self-reported level of knowledge of nutrition and the types of functional foods their children are fed for specific health conditions?
- Is there an association between parents' self-reported level of overall health and the type of functional foods their children are fed for specific health conditions?
- Does parental concern of the quality of their child's food intake correspond with types of functional foods their children are fed for specific health conditions?

CHAPTER II. LITERATURE REVIEW

Literature Review

There are a variety of factors that influence the purchase and consumption of foods in adults and parents alike. Of particular interest are the factors that influence consumers to buy functional foods and provide access to these foods to their families. An adult's perception of functional foods, overall nutrition knowledge, self-perceived health status, as well as concern over the quality of their children's diets have all independently been noted as influential factors in the purchase and consumption of foods with functions related to promoting health and decreased risk of disease.

Perceptions of Functional Foods

Whether or not parents feed their children functional foods may largely depend on how adults perceive functional foods, along with their level of belief that functional foods provide health benefits to them and their family. Consumers have begun to believe more and more that the foods they choose to consume directly contribute to their health (Siró, Kàpolna, Kàpolna, & Lugasi, 2008). In an annual public survey conducted regarding the use of functional foods, IFIC (2013) found that 90% of consumers agree that certain foods provide benefits beyond basic nutrition, an increase from 87% in 2011 and 89% in 2009.

In the same IFIC survey, 89% of surveyed consumers could name at least one functional food and its related health benefit(s) (IFIC, 2013). Twenty-seven percent of consumers say that a specific food or food component provides specific nutrients, as well as cardiovascular and digestive health benefits. While almost nine in ten Americans are interested in learning more

about functional foods and their health benefits (IFIC, 2013), the sales of functional foods are continuing to grow in the United States, as well as around the world (Sloan, 2014).

With the sales of functional foods totaling over $43.9 billion in the United States alone (Sloan, 2014), fortified/functional foods were the fastest-growing health/wellness food/beverage category in 2013 (Euromonitor, 2014). Although the market for functional foods is booming, the long-term success of this market is heavily dependent upon consumer acceptance and belief that specific foods will provide an added benefit to their health (Vella, Stratton, Sheeshka, & Duncan, 2014). Not only must consumers believe that food components will contribute to their health, but in order to be successful, functional foods must also be understood and desired by consumers, and delivered in a food product they trust (Kapsak, Rahavi, Childs, & White, 2011). Multiple research studies have demonstrated that there are a variety of factors that influence the acceptability and motivation for consumption of functional foods in America, as well as what influences a consumer's belief that functional foods provide health benefits beyond basic nutrition.

Factors affecting adults' perception. One factor that may determine acceptance or perception of a functional food is the health judgment of the food product itself. Research studies have suggested that the acceptability and purchase of functional foods/ingredients comes from the actual acceptance of the food product that acts as the carrier (Jonas & Beckmann, 1998; Poulsen, 1999). Specifically, Bech-Larsen and Grunert (2003) tested two popular functional ingredients, oligosaccharides and omega-3s, in three different food products—orange juice, yogurt, and a spread. Bech-Larsen and Grunert found that participants viewed the two functional ingredients as more of a health benefit in the spread, rather than in the yogurt of orange juice. Because a spread is seen as less healthy than orange juice or yogurt, consumers viewed the

enrichment of the orange juice and yogurt as less beneficial to their health than the enrichment of the spread (Bech-Larsen & Grunert, 2003). Since the health benefits of a food cannot be immediately experienced by consumers, unlike taste, it is important for benefits regarding health to be explicitly conveyed to the purchaser to increase awareness and belief among consumers (Siegrist, Stampli, & Kastenholz, 2008).

Although the actual product is an important element that influences consumers' willingness to purchase functional foods, there are other factors that affect acceptance that are indirectly related to the food product. An additional influence on perceptions of functional foods is social trust (Urala, Arvola, & Lähteenmäki, 2003). As stated previously, many health benefits derived from functional foods cannot be experienced directly; therefore, the consumer must have trust in the food industry that the physiological and psychology health claims they are making are true (Siegrist, et al., 2008). A research study conducted in Switzerland on consumer acceptance of functional foods determined that participants who had social trust in the food industry were more likely to purchase and consume functional foods when compared with those who reported low to no social trust (Siegrist et al., 2008). Additional consumer research suggests that consumers are more likely to perceive functional foods as more beneficial than conventional foods if they believe the functional products to be healthier (Frewer, Scholderer, & Lambert, 2003; Urala & Lähteenmäki, 2004). Trust and confidence in the source of nutrition information provided with the product is essential in forming a positive perception of functional foods.

Six in ten U.S. adults consume at least some sort of functional food on occasion (Sloan, 2014). This representative 60% reported eating yogurt for digestive health, cereal for heart health, along with foods that claim to reduce cholesterol or hunger, as well as foods for specific conditions. Over half of American adults choose to eat a particular food for a specific result;

therefore, it is of no surprise one of the largest factors that contributes to the sale of specific functional foods is the attractiveness of health claim or the perceived benefit that accompanies consumption of the food (Rezai, Teng, Mohamed, & Shamsudin, 2014; Siegrist, et al., 2008). The IFIC (2009) noted that of all benefits derived from functional foods, more than half of Americans consume functional foods for "overall health and wellness" (56%), "heart health" (55%), or to "contribute to a healthy body weight." Additional research has suggested that claims of physiological advantage or reduction in risk of chronic diseases has a greater influence over acceptance and purchase of functional foods rather than those of psychological claims, such as reduction of stress or fatigue (Siegrist et al., 2008; Vella et al., 2014).

In a study regarding awareness and perceptions of functional foods in older adults, specific information sources were found to increase likelihood of purchase and acceptability of functional foods (Vella et al., 2014). In a pool of 200 participants, 80.8% believed that nutrient content claims were informative, and 68.5% of those surveyed indicated that presence of nutrient content claim on a food label would increase likelihood of functional food purchases. Likewise, claims of actual nutrient function were found to be informative by 76.7% of participants, and 63.5% suggested this would increase possibility of future purchases of functional foods. Additionally, 53.8% indicated that the inclusion of disease risk reduction statements, particularly those that included cancer, heart disease, and osteoporosis and bone health would increase likelihood of consuming functional foods. From this study, it was suggested that an increased awareness and knowledge of specific functional foods and their specific health benefits is the most significant factor in increasing functional food consumption (85.5% of participants agreed).

Factors affecting parents' perception. Among the adult population, when parents' perceptions of functional foods were analyzed specifically, the main influence over the types of

food they purchase for their children is the ability of the food to protect the health of the child. Forty-one percent of the 32 million American mothers reported feeding their children healthy food always and 88% reported to do so at least sometimes (Sloan, 2014). Ranking fifth among the top ten functional food trends predicted for 2014-2015 was functional foods targeted specifically for children (Sloan, 2014). Mothers who reported feeding their children functional foods on a regular basis described the provision of the foods for various health benefits. General well-being, immunity, fear of lack of nutrients, cognitive development, and energy/strength were reported as the top five motivators for consuming functional foods in the home (MSI, 2012). To receive these benefits, approximately one-third of mothers are increasing fresh and unprocessed foods, calcium, whole grains, along with other healthful food ingredients in order to receive essential nutrients needed for the proper growth and development of a child (Sloan, 2014).

Knowledge of Nutrition

Although there has been an increased interest in the diet and the role it plays in general health of the human body, many people are often hesitant to try unfamiliar foods, no matter the health claim. An increase in a consumer's nutrition knowledge is suggested to result in a more health-conscious role in purchasing foods (Crites & Aikman, 2005). There have been several studies that objectively measured nutrition knowledge and found a positive correlation to the increase of healthy foods (Patterson, Kristal, Lynch, & White, 1995; Wardle, Parmenter, & Waller, 2000), which include fruits, vegetables, fiber, and a variety of other foods associated with health. Similarly, research that analyzed nutrition knowledge subjectively found that the more knowledgeable a person perceives themselves to be, the more likely they were to eat functional foods (IFIC, 2009; IFIC, 2013).

Although perceptions of various types of functional foods have a large degree of influence over a buyer's decisions regarding functional foods, nutrition knowledge that is tested objectively may independently impact the application of functional foods to the diet (Harper, 1999; Siró, Kàpolna, Kàpolna, & Lugasi, 2008). A study completed by Ares, Giménez, and Gàmbaro (2008) reported that there was a statistically significant relationship between a consumer's objectively measured knowledge of nutrition and his/her willingness to try a functional food. Common and well-known functional ingredients, such as vitamins, minerals, or fiber, are far more accepted than that of other functional ingredients that are not as familiar, like omega-3 fatty acids or carotenoids, for example (Bech-Larsen & Scholderer, 2007; Krygier, 2007). This is due to the fact that consumers simply do not possess the knowledge of what health benefits functional foods or ingredients will provide upon consumption, and explanation of health claims should be considered in the long-term success of functional foods (Vella, et al., 2014).

Similarly, Wansink, Westgren, & Cheney (2006) hypothesized that the integration of functional foods into the diet would be more likely to occur if consumers were aware of the personal benefits that would be derived from consuming specific functional foods. However, contrary to other studies, Wansink, Westgren, & Cheney (2006) concluded that the type of nutrition knowledge a person possesses directly influences their consumption of functional foods, not necessarily the amount. Merely knowing about the health benefits of a functional food is not enough to encourage consumption; being able to link the claimed attributes of the foods to personal benefit and having a large degree of self-efficacy related to functional foods will increase the likelihood of incorporating functional foods into the diet. When participants of the study were asked particularly about the consumption of soy products, 68% of participants with a

combination of attribute and consequence knowledge reported consuming soy products on a regular basis, compared to 15% of attribute-only knowledge, and 24% of consequence-only knowledge. While it is important to not only assess whether a consumer has nutrition knowledge, it is also important to understand the extent to which the consumer believes and takes confidence in their knowledge.

When the diet and health of a child is considered, the self-efficacy of nutrition knowledge of a parent may play a large role in the provision of healthy and unhealthy foods in the home, along with a decrease in various health conditions related to diet. While studies have produced results that tested parental knowledge of nutrition plays no role of healthy eating in children (Hudson, Stotts, Pruett, & Cowan, 2005; Peters, Dollman, Petkov, & Parletta, 2012), results from a self-reporting survey by Campbell, Abbott, Spence, Crawford, McNaughton, and Ball (2013) suggested that nutrition knowledge of the mother of the household was positively and significantly correlated to a child's consumption of fruits, vegetables, and cake, while negatively associated with a decrease in consumption of soft drinks and salty snacks. The same results were observed for home availability of fruits and vegetables. Parental knowledge of nutrition has also been linked to weight status in a child; the greater the parent's actual level of nutrition knowledge, the less likely their child was to be overweight/obese (Variyam, 2001). While the Institute of Medicine (2011) recommends that parents provide healthy food to their children and encourage them to eat those healthy foods, a lower level of objectively measured nutrition knowledge among parents was associated with more pressure on a child to eat, along with more restrictions on the diet of the child (Slusser et al., 2012). Adequate levels of both actual nutrition knowledge and self-efficacy of nutrition knowledge among parents are critical for maintaining the health and well being of children.

Overall Health of Parents

With the increasing interest and emphasis on achieving a healthy lifestyle, physical activity and proper nutrition are key aspects in disease prevention and positive lifestyle changes. The overall health of an individual may influence the ability or likelihood of purchase and consumption of functional foods. The International Food Information Council (2009) reported that participants who described their overall health status as "excellent" (71%) were more likely to "strongly agree" that specific foods provide health benefits beyond basic nutrition, where as those who reported their health as good, fair, or poor were less likely to "strongly agree" with this statement. Those with an increased interest in general health were reported to have an increased likelihood of purchasing functional foods for general health benefits (Dean et al., 2012). Consumers associate the purchase and consumption of functional foods with a better sense of control over their lifestyle and overall well being (Urala & Lähteenmäki, 2003).

In addition to the association between functional food consumption and the maintenance of a positive health image, functional food purchase has also been correlated with the prevention of chronic disease. Dean et al. (2012) and Niva (2007) demonstrated that if an individual feels as though they are at higher risk for contracting a specific disease, they are more likely to consume functional foods that provide health benefits related to that particular disease. The increase in consumption and purchase of functional foods was significantly higher when the functional food benefit was thought to contribute to risk reduction, rather than a general nutrition claim (Dean et al., 2012). The perceived overall health status of an individual can also play a role in the specific types of functional foods that a consumer may select for purchase. A study reported that consumers with modern health worries (e.g., genetic modification and hormone/additives in foods) were more likely to choose functional foods with benefits that protect against disease,

rather than choosing foods that were risk-reducing or claimed to enhance appearance (Devich, Peterson, & Petrie, 2007).

Parental food modeling for children's health. Parents serve an important role in the development of health for their children. Although parental influence of consumption of functional foods has been minimally studied, the overall health and diet of parents has been found to have a large influence on the food their children consume. In order to increase children's fruit and vegetable intake as well as ease parental concern, parental food modeling has often been adopted as an effective strategy. Models, especially those seen as similar to the observer (peers) or in a position of power (teacher, parent), can have powerful influence over the food choices of children (Birch, 1980a; Birch, 1980b). Children learn about food through the exposure of eating the food, as well as observing the eating of that particular food by others (Savage et al., 2007). Since the majority of a child's intake occurs in the home (Nielsen, Siega-Riz, & Popkin, 2002) and food behaviors and fundamentals are established in the home (Birch & Davison, 2001), parents are a crucial tool in establishing and modeling proper food choices for a child.

In a study of preschool-age children, Birch (1980a) found that vegetable selection and consumption were directly related to the selection and consumption of vegetables by their peers. Similar effects have been noted when children observe adults eating. Hendy (2002) discovered that a child had an increased intake of a food when they observed a teacher willingly consuming the food. Similarly, adolescent girls who observed their father drinking milk had higher calcium levels than those who did not (Lee & Reicks, 2003). Parental modeling has also been noted as an effective strategy in encouraging a higher fruit juice and vegetable intake among school-aged children (Cullen, et al., 2001; Young, Fors, & Hayes, 2004). Providing a positive image for

children through modeling of healthy nutritional habits can impact a child's health status for the rest of their lives.

Concern for Children's Eating Behaviors

The progression of eating behaviors is essential in a child's physical development and health, and can be influenced by a variety of factors, namely social interactions surrounding feeding and level of concern (Savage, Fisher, & Birch, 2007; Vereecken, Legiest, De Bourdeaudhuij, & Maes, 2009). Although a variety of factors have a correlation with a child's eating patterns and development, the home food environment where eating habits are established and supported is found to be particularly powerful (MacFarlane, Crawford, & Worsley, 2010). The practices of feeding that a parent employs have the potential to impact their child for the rest of the child's life.

Although parental concern may be perceived as concern solely for a child's general health, *what* a child actually consumes makes up a large part of a child's general health status. While children are relatively free to make their own decisions regarding food preferences and consumption, likes and dislikes for certain foods are positively correlated to parental concern of health, and, as a result, what specific foods parents make available in the home (Roos, Lehto, & Ray, 2012). One study examined the relationships among availability and preferences for fruits, vegetables, and fruit juices in fourth-grade students (n=88) and their parents. Researchers of this experiment found that the only significant predictor of preference for the fruits, vegetables, and juices among children was the availability of those foods in the home (Cullen, 2003). While parent-feeding practices may vary from family to family, of importance is the realization that some practices may produce unintended consequences among their children. Parental prompts and encouragement to consume certain foods have been shown to produce conflicting results,

positively influencing children's health in some studies (Klesges et. al., 1983; Klesges, Stein, Eck, Isbell, & Klesges, 1991), while negatively influencing the health of the child in others (Drucker, Hammer, Agras, & Bryson, 1999; Koivisto, Fellenius, & Sjoden, 1994; Patterson, Typpo, Typpo, & Krause, 1991). Parental influence may often be driven by concern, but have an opposite effect on the general health of their child.

Though many parents believe that concern about their children's health and weight is demonstrated through a positive influence on the child's development of food intake, research has demonstrated that, at times, exercising too much concern and influence can have negative consequences towards a child's food choices and ability to regulate consumption (Johnson & Birch, 1994; Wardle, Sanderson, Guthrie, Rapoport, & Plomin, 2002). For example, parents may aim to promote the consumption of nutrient-dense food by telling a child to eat their vegetables, while also restricting access to "unhealthy" or "junk" foods. By using these techniques, parents may hope to promote a healthier diet for their child, or perhaps to treat/prevent obesity, but often creates a paradoxical effect, resulting in overconsumption of "unhealthy" foods, and a decrease in food preferences for the nutrient-dense foods (Savage et al., 2007). Excessive parental concern may also manifest with the parent being overly restrictive when it comes to their child's eating habits. A study found that when girls were finally granted access to restricted foods, they took larger portions and ate more than freely accessible foods (Francis & Birch, 2005). While over restriction of children's food intake related to concern may produce negative effects in a child's food choice, the same may be said for under restriction. According to a study by Vereecken et al. (2009), the practice of letting children decide what they eat was significantly detrimental to their eating habits. These children were shown to eat

breakfast less often, eat fewer fruits and vegetables, and consume more soft drinks and sweets on a daily basis.

Children eating-away-from-home patterns. A major area of parental concern related to what types of foods children consume often involves the choices made when eating away from the home, as well as the nutritional implications that accompany those choices. While home-cooked meals have been associated with higher fruit and vegetable consumption (Larson, Fulkerson, Story, & Neumark-Sztainer, 2013), fiber, and vitamins/minerals (Gillman et al., 2000), a higher consumption of saturated and *trans* fats, soft drinks, and fried foods are associated with eating away from the home, especially in children and adolescents (Gillman et al., 2000). It has been found that an increasing percentage of food that a child consumes daily is prepared and consumed away from the family table (Nielsen et al., 2002). In these situations, children are routinely served larger portions than would be served in the home (Nielsen & Popkin, 2003), as well as more energy and fat (Bowman, Gortmaker, Ebbeling, Pereira, & Ludwig, 2004), and an overall poorer diet quality (Bowman, 2002). Children in modern-day society are spending less time eating inside the home, and, as a result, have excessive exposure to larger portions of palatable, energy dense foods than in previous decades (Savage et al., 2007). Eating out is most often related to busy lifestyles of the family, wanting to try new/different foods, or needing a break from cooking in Asian, Hispanic, and non-Hispanic white parents at-home and away-from-home eating patterns (Cluskey et al., 2008). A few of the parents expressed concern about the health consequences of eating out too often, and, in turn, often limited the amount of exposure their family had to consuming meals outside of the home. Evidence that parents limit time spent consuming meals away from home, especially because of the knowledge of the health concerns

associated with restaurants and fast food demonstrates that concern for (a) child(ren)'s health is present among parents (Cluskey et al., 2008).

Child's food consumption. Children's intake of specific foods is not only influenced by the types of foods available, but also by the amounts of those foods present for consumption. Rolls, Engell, and Birch (2000) found that when preschool-aged children were exposed to portion sizes twice the size of an age-appropriate portion of an entrée, the children ate 25-29% more than the original appropriate portion size of the food. The children did not decrease their intake of extra foods in order to compensate for additional intake of the entrée. As a result of this experiment, caloric intake was 9-15% higher at meals where larger portions were served. In a focus group of parents of young children, parents feared overly restricting foods and the potential consequences for the children. Of particular concern was that this type of parental behavior might lead to a child overconsumption of a restricted food in social settings where the restricted food may be available (Petrunoff, Wilkenfeld, King, & Flood, 2012).

Adult perceptions of functional foods, and self-reported knowledge of nutrition and one's overall health, along with concern for children's eating behaviors, may have an effect on the purchase and consumption of functional foods. However, there has been minimal research conducted to determine whether or not any of these factors play a role in the types and amounts of functional foods that parents feed their children. Therefore, the objective of this research study is to fill gaps in current research by identifying parent's 1) level of belief that certain foods provide health benefits beyond basic nutrition, 2) level of self-reported nutrition knowledge, and 3) self reported assessment of the quality of their health, along with 4) level of concern related to their children's eating habits. An additional objective will be to determine whether or not these parental beliefs, knowledge, and level of health and nutrition, along with concern for their

children's eating habits correspond with parents feeding their children functional foods for health conditions, specifically digestive health, weight management, bone health, cancer prevention, heart health, and other health benefits.

CHAPTER III. METHODS

Methods

Research Design

This study is part of a larger study using a quantitative, descriptive design to conduct research on parents' attitudes, awareness, usage, motivations, and barriers toward functional foods. The research also examined parental concern over their child(ren)'s diet(s), as well as the provision of specific functional foods into the diet of their children. The Institutional Review Board (IRB) from the University of Mississippi approved the research protocol.

Participants

Three criterion were required for an individual to be included in this research study: an adult at least 18 years of age; a parent or guardian of a child 18 years of age or younger currently living in the home; and had a child attending a school in the Lafayette County School District in Lafayette County, MS, or a designated school in the Tupelo Public School District in Tupelo, MS. To recruit participants for this study, potential subjects were asked to complete the survey using a solicitation flyer that was given to children to take home at Lafayette Elementary School and a flyer through email solicitation in the remaining Lafayette County Schools and all the selected Tupelo Public schools.

Since a K-12 school district involves students 18 years of age and younger, these public school venues were chosen in order to reach a diverse socioeconomic population of parents or guardians. Using this method of recruitment, we distributed an estimated 6,306 paper or electronic flyers (one per student) to solicit parents as participants to the study. Lafayette County Schools include all schools in the county: Lafayette Elementary School, Lafayette Upper

Elementary School, Lafayette Middle School, and Lafayette High School. Selected schools from Tupelo Public Schools include Joyner Elementary School, Tupelo Middle School, and Tupelo High School.

Survey Instrument

The survey instrument chosen for conducting the research study on functional foods was a quantitative, electronic or paper survey, adapted with permission from the 2009 and 2013 International Food Information Council surveys (IFIC, 2009; IFIC, 2013).

The survey is composed of five sections: attitude and self-reported knowledge toward food and nutrition, awareness and usage of functional foods, motivations toward functional foods, barriers toward functional foods, and parental demographic questions. Willing participants answered two screening questions at the beginning of the survey: 1. "Are you at least 18 years of age?" 2. "Are you the parent or guardian of a child 18 years of age or younger living with you?" If the participant answered "no" to either screening question, they were thanked for their time and notified that they would not need to proceed further in the study.

This study specifically utilized questions assessing parents' attitude and self-reported knowledge about food and nutrition and self-reporting of the quality of their overall health, along with parents' concern about their child(ren) eating nutritiously using Likert-type questions. In addition, this study included twenty-seven "yes" or "no" questions regarding parent's usage of functional foods in feeding their child(ren).

A pilot study using 12 participants was conducted from July 2 - August 28, 2014 in order to determine any errors in the instrument and the average time it took to complete the survey. Based on the pilot test, small errors in some questions were identified and corrected. The survey took approximately 10 to 15 minutes to complete.

Variables

Five major variables were analyzed in this study. The four independent variables included the level of belief that certain foods provide health benefits beyond basic nutrition, parental level of self-reported nutrition knowledge, parents' self-reported health status, and level of concern of nutrition of children's eating habits. The dependent variable included whether or not parents fed their children functional foods for health conditions. The functional foods variable was divided into the following function types according to the food's function: weight management, digestive health, cancer prevention, heart health, bone health, and other. Other consisted of benefits relating to eye health, oral health, reduced risk of neural tube birth defects, cognitive development, immune system health, and maintaining optimal health. The specific survey questions corresponding to these variables are provided in Appendix A. Table 1 (below) demonstrates the division of each functional food into its respective category.

Table 3.1. Functional Food Categories

Function Type	Functional Food
Digestive Health	• Prebiotic fiber • Fiber (C)[1] • Probiotics (A)[1]
Heart Health	• Monounsaturated fats • Plant sterols • Potassium • B vitamins • Whole grains • Fiber (A)[1] • Soy/soy protein (B)[1] • Folate or folic acid (B)[1] • Omega-3 fatty acids (A)[1]
Cancer Prevention	• Antioxidants • Lycopene • Fiber (D)[1] • Soy/soy protein (A)[1]
Weight Management	• Herbs and spices • Fiber (B)[1] • Protein (A)[1]
Bone Health	• Calcium • Vitamin D
Other[2]	• Lutein and other carotenoids • Xylitol • Folate or folic acid (A)[1] • Omega-3 fatty acids (B)[1] • Probiotics (B)[1] • Protein (B)[1]

[1] A, B, C, & D correspond to a separate health function per food found on the survey instrument with some foods having multiple functions (see Appendix A).
[2] Other includes benefits related to eye health, oral health, reduced risk of neural tube defects, cognitive development, immune system health, and maintaining optimal health.

Procedures

Parent/gaurdians were recruited via a take-home flyer or flyer through email solicitation at the "pre-selected" elementary, middle, and high schools in Tupelo and Layfayette County, Mississippi. Based on the specific school's requirements, a take-home flyer was given to students at the Lafayette Elementary School. When the flyer was given to the students, they were verbally asked to take it home to their parents. The flyer described the purpose of the study and the benefit to the participant in helping with research on an important nutrition topic (see

Appendix C). The parents of children at the selected schools in Tupelo, as well as the remaining schools in Lafayette County (Lafayette Upper Elementary School, Lafayette Middle School, and Lafayette High School), received an email containing the purpose of the study, the benefit of participation, as well as the link to the survey. Since not all parents/guardians had a computer or internet at home, the flyer suggested they could contact a researcher and a paper copy survey would be mailed to their home.

After reading the flyer, the participant completed the survey by using the web address provided on the flyer (http://www.kidsfood.us). When the participant completed the survey, he/she was thanked for their participation, at which point, his/her participation in the survey was complete. Confidentiality of the participant's responses was retained throughout the study.

Analysis

Data was collected from the surveys and entered into that statistical software package IBM SPSS Statistics for Mac, version 22.0 (IBM, 2013) for analysis. Demographics and usage of categories of functional foods for health conditions were analyzed using descriptive statistics. Correlations and frequencies were used to describe the rate of response to each question, as well as the relationship of each independent variable to the dependent variable. The impacts of independent variables on dependent variables were analyzed using multiple linear regression.

CHAPTER IV. RESULTS

Results

Sample

The original sample size for this study was n=392. Any respondents with one or more unanswered questions used for analysis were deleted from the data, which accounted for 186 drops. Three responses were deleted when "Don't Know" was selected as a response for attitude towards functional foods. One response was deleted when "Don't Know" was selected as a response for self-reported overall health. After all dropouts were recoded, the new sample size was n=202. Although the total number of households represented in both school districts is unknown, results demonstrated that there were approximately 1.78 children per household.

Descriptive statistics of the sample population are found in Table 4.1. Of the sample respondents, 92.6% (n=187) were female. Age of participants varied greatly, with the majority of respondents being aged 35-64 (74.7%). 82.2% of participants were white, and 14.9% were African-American. When marital status was analyzed, 77.7% of participants were married, and only 8.9% were divorced. Income of participants also varied greatly; a fairly even spread occurred across all income levels. Over half of the respondents held a Bachelor's degree or more, with 30.2% possessing a Graduate/Professional degree.

Table 4.1. Sample Population

	Female	*Male*	*No Answer*				
Gender	92.6%	6.9%	0.5%				
	18-34	*35-44*	*45-64*	*No Answer*			
Age	24.8%	36.6%	38.1%	0.5%			
	White	*African American*	*Other*	*No Answer*			
Race	82.2%	14.9%	2.5%	0.5%			
	Single	*Married*	*Widowed*	*Divorced*			
Marital Status	11.9%	77.7%	1.5%	8.9%			
	<$35,000	*$35,000-<$50,000*	*$50,000-<$75,000*	*$75,000-<$100,000*	*$100,000-<$150,000*	*$150,000 or above*	*Don't Know/No Answer*
Income	12.9%	13.9%	20.8%	22.3%	17.8%	9.4%	3%
	Some H.S./Diploma	*Some College/No Degree*	*Associate Degree*	*Bachelor Degree*	*Professional Degree*		
Education	3.5%	18.3%	13.4%	34.7%	30.2%		

Table 4.2 describes the frequencies of responses to the independent variables. 61.9% of respondents strongly agreed that certain foods provide benefits beyond basic nutrition, while only 17.3% strongly or somewhat disagreed. When self-reported knowledge of nutrition was assessed, only 5.9% of participants reported being extremely knowledgeable in the area of nutrition, while the majority considered themselves somewhat or very knowledgeable. The self-reported overall health of participants was reported as good (34.7%) or very good (35.6%), while

more participants considered themselves as having poor health (15.3%) than excellent health (14.4%). Responses regarding concern for the quality of children's diets demonstrated that only 4.5% of parents were not at all concerned about their children's diets, while the largest number of parents (35.6%) was very concerned about the quality of diets in their children.

Table 4.2. Descriptive Statistics of Independent Variables (N=202)

	1= Strongly/Somewhat Disagree	*2= Somewhat Agree*	*3=Strongly Agree*		**Mean (SD)**
Attitude	17.3%	20.8%	61.9%		2.45(.772)
	1=Little/No Knowledge	*2=Somewhat Knowledgeable*	*3=Very Knowledgeable*	*4=Extremely Knowledgeable*	
Knowledge	9.4%	47.0%	37.6%	5.9%	2.40(.742)
	1=Poor/Fair	*2=Good*	*3=Very Good*	*4=Excellent*	
Overall Health	15.3%	34.7%	35.6%	14.4%	2.49(.921)
	1=Not at all Concerned	*2=Slightly Concerned*	*3=Somewhat Concerned*	*4=Very Concerned*	
Concern	4.5%	26.7%	33.2%	35.6%	3.00(.898)

When frequencies of responses to the dependent variable were analyzed with 0=no and 1=yes, results that were found are demonstrated in Table 4.3. Each response average was taken as an average of the answers for each function category of functional foods. For functional foods providing benefits related to digestive health, approximately half (52.5%) of parents reported feeding their children all of the foods within the category, while only 10.9% did not report feeding their children any of the foods with benefits related to digestive health. Only 10.9% of

parents reported never feeding their children any of the foods with benefits related to weight management. The majority (86.1%) of respondents recorded feeding their children both of the foods listed in the bone health category. Only 13.9% of parents reported feeding their children all foods listed in the function category of cancer prevention; the majority of parents fed their children at least one. The function category of heart health had a wide variety of response averages. Since other included various health benefits, the response average varied greatly among participants.

Table 4.3. Descriptive Statistics of Dependent Variable (0=No, 1=Yes)

Function	*Response Average*	*Frequency of Positive Response (%)*	Mean (SD)
Digestive Health	.00	22 (10.9%)	.7244 (.345)
	.33	27 (13.4%)	
	.67	47 (23.3%)	
	1.00	106 (52.5%)	
Weight Management	.00	22 (10.9%)	.6073 (.334)
	.33	56 (27.7%)	
	.67	60 (29.7%)	
	1.00	64 (31.7%)	
Bone Health	.00	8 (4%)	.9109 (.238)
	.50	20 (9.9%)	
	1.00	174 (86.1%)	
Cancer Prevention	.00	22 (10.9%)	.5111 (.303)
	.25	49 (24.3%)	
	.50	57 (28.2%)	
	.75	46 (22.8%)	

	1.00	28 (13.9%)	
Heart Health	.00	17 (8.4%)	.5935 (.299)
	.11	12 (5.9%)	
	.22	8 (4.0%)	
	.33	12 (5.9%)	
	.44	13 (6.4%)	
	.56	27 (13.4%)	
	.67	30 (14.9%)	
	.78	34 (16.8%)	
	.89	31 (15.3%)	
	1.00	18 (8.9%)	
Other	.00	24 (11.9%)	.4794 (.306)
	.17	28 (13.9%)	
	.33	41 (20.3%)	
	.50	30 (14.9%)	
	.67	33 (16.3%)	
	.83	27 (13.4%)	
	1.00	19 (9.4%)	

Functional Foods

Pearson r correlation coefficients were obtained for bivariate correlations between each of the independent variables and parental feeding of functional foods to their children. Self-reported parental knowledge of nutrition and parental overall health were found to be positively correlated with parental feeding of functional foods (r=.381, $p<.01$; r=.184, $p<.01$ two-tailed, respectively). Because parental attitude, nutrition knowledge, health, and concern over children's

diet can be correlated with one another, a multiple linear regression was run to determine which of these independent variables were independently associated with parental feeding of functional foods to their children. These variables accounted for 13.2% of the variance in feeding their children functional foods. Self-reported overall health of the parent had a positive correlation with feeding functional foods to their children when considered independently; however, when all independent variables were controlled for, overall health was not found to have a significant impact on the provision of functional foods. Parent's self-reported nutrition knowledge and overall health are likely positively correlated, which would result in an insignificant impact when the multiple regression was considered. The variable self-reported parental nutrition knowledge had a statistically significant impact on parents feeding their children functional foods (β=.359, p<.001). As self-reported nutrition knowledge increased by one category, the dependent variable increased by 0.124 points. There was no statistical significance found for parent's food and nutrition attitude, overall self-reported health, or concern in feeding their children nutritiously. Correlation coefficients and regression estimates for all variables can be found in Table 4.4.

Table 4.4. All Functional Foods (N=202)

Variable	Pearson *r*	Multiple Regression			
	All	β	SE_b	*b*	*P*
Constant			.106	.238	.026*
Attitude	-.037	.006	.022	.002	.932
Knowledge	.381**	.359	.024	.124	.000***
Health	.184**	.071	.020	.020	.321
Concern	.003	.009	.019	.003	.895
Mean	.596				
SD	.255	*Adjusted* R^2 = .132			

Note: *p<.05, **p<.01, ***p=.000 (2-tailed).

Digestive Health

Pearson r correlation coefficients were obtained for bivariate correlations between each of the independent variables and parental feeding of functional foods related to digestive health. Self-reported parental knowledge of nutrition and self-reported overall health was positively correlated with parental feeding of these foods (r=.272, *p*<.01; r=.208, *p*<.01 two-tailed, respectively). Because parental attitude, knowledge, health, and concern over children's diet can be correlated with one another, a multiple linear regression was run to determine which of the independent variables are independently associated with feeding children functional foods with digestive health benefits. These variables accounted for 7.4% of the variance in parental feeding of functional foods related to digestive health. The variable parent's self-reported nutrition knowledge had a statistically significant impact on parents feeding their children functional foods (β=.227, *p*<.01). As knowledge increased by one category, the dependent variable

increased by 0.105 points. There was no statistical significance found for parent's attitude, overall health, or concern in feeding their children nutritiously. Correlation coefficients and regression estimates for all variables can be found in Table 4.5.

Table 4.5. Digestive Health (N=202)

Variable	Pearson *r*	Multiple Regression			
	Digestion	β	SE_b	*b*	*p*
Constant			.149	.275	.065
Attitude	-.016	.016	.031	.007	.817
Knowledge	.272**	.227	.034	.105	.002**
Health	.208**	.144	.028	.054	.052
Concern	.016	.039	.027	.015	.578
Mean	.724				
SD	.345	*Adjusted* R^2 = .074			

Note: **p<.01 (2-tailed).

Weight Management

Pearson r correlation coefficients were obtained for bivariate correlations between each of the independent variables and parental feeding of functional foods related to weight management. Self-reported parental knowledge of nutrition was positively correlated with parental feeding of these foods (r=.371, *p*<.01 two-tailed). Because parental attitude, knowledge, health, and concern over children's diet can be correlated with one another, a multiple linear regression was run to determine which of the independent variables are independently associated with feeding children functional foods with weight management benefits. These variables accounted for 12.3% of the variance in parental feeding of functional foods related to weight

management. The variable parent's self-reported nutrition knowledge had a statistically significant impact on parents feeding their children functional foods (β=.384, p<.001). As knowledge increased by one category, the dependent variable increased by 0.173 points. There was no statistical significance found for parent's attitude, overall health, or concern in feeding their children nutritiously. Correlation coefficients and regression estimates for all variables can be found in Table 4.6.

Table 4.6. Weight Management (N=202)

Variable	Pearson *r*	Multiple Regression			
	Weight	β	SE_b	*b*	*p*
Constant			.140	.165	.240
Attitude	-.013	.024	.029	.010	.719
Knowledge	.371**	.384	.032	.173	.000***
Health	.084	-.032	.026	-.012	.653
Concern	.044	.028	.025	.010	.679
Mean	.607				
SD	.334	*Adjusted* R^2 = .123			

Note: **p<.01, ***p=.000 (2-tailed).

Bone Health

Pearson r correlation coefficients were obtained for bivariate correlations between each of the independent variables and parental feeding of functional foods related to bone health. No independent variables were found to have any significant correlation with the dependent variable. Because parental attitude, knowledge, health, and concern over children's diet can be correlated with one another, a multiple linear regression was run to determine which of the independent

variables are independently associated with feeding children functional foods with bone health benefits. These variables were not significant in predicting an impact with the feeding of functional foods with benefits contributing to bone health. Correlation coefficients and regression estimates for all variables can be found in Table 4.7.

Table 4.7. Bone Health (N=202)

Variable	Pearson *r*	Multiple Regression			
	Bone	β	SE_b	*b*	*p*
Constant			.107	.762	.000***
Attitude	.001	.010	.022	.003	.892
Knowledge	.062	.018	.024	.006	.808
Health	.132	.137	.020	.035	.075
Concern	.023	.050	.019	.013	.494
Mean	.911				
SD	.238	*Adjusted* R^2 = .000			

Note: ***p=.000 (2-tailed)

Cancer Prevention

Pearson r correlation coefficients were obtained for bivariate correlations between each of the independent variables and parental feeding of functional foods related to cancer prevention. Self-reported parental knowledge of nutrition was positively correlated with parental feeding of functional foods (r=.274, p<.01 two-tailed). Because parental attitude, knowledge, health, and concern over children's diet can be correlated with one another, a multiple linear regression was run to determine which of the independent variables are independently associated with feeding children functional foods with cancer prevention benefits. These variables accounted for 5.8%

of the variance in parental feeding of functional foods related to cancer prevention. The variable parent's self-reported nutrition knowledge had a statistically significant impact on parents feeding their children functional foods (β=.267, p<.001). As knowledge increased by one category, the dependent variable increased by 0.109 points. There was no statistical significance found for parent's attitude, overall health, or concern in feeding their children nutritiously. Correlation coefficients and regression estimates for all variables can be found in Table 4.8.

Table 4.8. Cancer Prevention (N=202)

Variable	Pearson *r*	Multiple Regression			
	Cancer	β	SE_b	*b*	*p*
Constant			.132	.198	.135
Attitude	.000	.030	.027	.012	.662
Knowledge	.274**	.267	.030	.109	.000***
Health	.114	.030	.024	.010	.689
Concern	.000	-.002	.024	-.001	.982
Mean	.511				
SD	.303	*Adjusted* R^2 = .058			

Note: **p<.01, ***p=.000 (2-tailed).

Heart Health

Pearson r correlation coefficients were obtained for bivariate correlations between each of the independent variables and parental feeding of functional foods related to heart health. Self-reported parental knowledge of nutrition and self-reported overall health were positively correlated with parental feeding of these foods (r=.369, p<.01; r=.155; p<.05 two-tailed, respectively). Because parental attitude, knowledge, health, and concern over children's diet can

be correlated with one another, a multiple linear regression was run to determine which of the independent variables are independently associated with feeding children functional foods with heart health benefits. These variables accounted for 12.1% of the variance in parental feeding of functional foods related to heart health. The variable parent's self-reported nutrition knowledge had a statistically significant impact on parents feeding their children functional foods (β=.354, p<.001). As knowledge increased by one category, the dependent variable increased by 0.143 points. There was no statistical significance found for parent's attitude, overall health, or concern in feeding their children nutritiously. Correlation coefficients and regression estimates for all variables can be found in Table 4.9.

Table 4.9. Heart Health (N=202)

Variable	Pearson *r*	Multiple Regression			
	Heart	β	SE_b	*b*	*p*
Constant			.126	.233	.065
Attitude	-.059	-.019	.026	-.007	.773
Knowledge	.369**	.354	.028	.143	.000***
Health	.155*	.040	.023	.013	.581
Concern	.002	.003	.023	.001	.966
Mean	.594				
SD	.299	*Adjusted* R^2 = .121			

Note: *p<..05, **p<.01, ***p=.000 (2-tailed)

Other

Pearson r correlation coefficients were obtained for bivariate correlations between each of the independent variables and parental feeding of functional foods with miscellaneous health benefits. Benefits that were categorized as "other" included eye health, oral health, reduced risk

of neural tube birth defects, cognitive development, immune system health, and maintaining optimal health. Self-reported parental knowledge of nutrition and self-reported overall health were positively correlated with parental feeding of these foods (r=.336, p<.01; r=.192, p<.01 two-tailed, respectively). Because parental attitude, knowledge, health, and concern over children's diet can be correlated with one another, a multiple linear regression was run to determine which of the independent variables are independently associated with feeding children functional foods with miscellaneous health benefits. These variables accounted for 10.3% of the variance in parental feeding of functional foods related to weight management. The variable parent's self-reported nutrition knowledge had a statistically significant impact on parents feeding their children functional foods (β=.309, p<.001). As knowledge increased by one category, the dependent variable increased by 0.127 points. There was no statistical significance found for parent's attitude, overall health, or concern in feeding their children nutritiously. Correlation coefficients and regression estimates for all variables can be found in Table 4.10.

Table 4.10. Other Functions (N=202)

Variable	Pearson *r*	Multiple Regression			
	Other	β	SE_b	b	p
Constant			.130	.115	.375
Attitude	-.035	.005	.027	.002	.940
Knowledge	.336**	.309	.029	.127	.000***
Health	.192**	.089	.024	.030	.221
Concern	-.030	-.020	.023	-.007	.774
Mean	.479				
SD	.306	*Adjusted* R^2 = .103			

Note: **p<.01, ***p=.000 (2-tailed).

CHAPTER V. DISCUSSION

Discussion

There is minimal existing research that has examined the relationship of what influences adult consumption of functional food, and even less examining what factors prompt parents to feed their children specific functional foods. The purpose of this study was to provide an explanation to whether parent's attitude towards functional foods, self-reported knowledge of nutrition, self-reported overall health, and concern for their children's diet play a role in providing functional foods to their children, as well as to contribute to the expanding body of research related to functional foods.

Prior to the study, it was hypothesized that parental attitude toward functional foods, self-reported knowledge of nutrition, self-reported health status, and concern over the quality of their child(ren)'s diet would each be independently associated with the feeding of functional foods to children for specific types of health conditions: digestive health, weight management, bone health, cancer prevention, heart health, and "other" miscellaneous health benefits.

A primary finding of this study suggests that self-reported parental level of nutrition knowledge enhances the feeding of functional foods to their children. Self-reported knowledge of nutrition was found to be significant in all of the food function categories, with the exception of bone health. Though this study was unique in that it analyzed self-reported parental knowledge related to feeding children functional food, this finding was consistent with previous research that suggests that a person's objectively measured knowledge of nutrition is positively associated with not only health-conscious decision making when selecting foods (Harper, 1999; Siró et al., 2008), but also their willingness to try functional foods (Ares et al., 2008).

There is minimal existing research that examines a parent's knowledge of nutrition through a self-reported method. Wansink, Westgren, and Cheney (2006) report that the consumption of functional foods is dependent upon whether it is attribute-related or consequence-related nutrition knowledge a consumer possesses, not the amount. These researchers suggest that a combination of both attribute-related knowledge and consequence-related knowledge of functional foods is the most influential in the purchase and consumption of functional foods. Previous results of self-reported nutrition knowledge described by IFIC (2013) demonstrated that 79% of survey participants remained confident that they were at least "somewhat knowledgeable" in the area of nutrition, and 48% thought they possessed enough knowledge to know which specific functional foods provide specific benefits. Similarly, this study reported that most (90.6%) of participants reported themselves as being "somewhat knowledgeable" about nutrition or above (very knowledgeable, extremely knowledgeable). Since knowledge in this study was self-reported, there was no definitive measure of perceived parental knowledge against actual nutrition knowledge. This study, along with the International Food Information Council supports that the more knowledgeable a parent perceives themselves to be about nutrition, the more likely they are to feed their children functional foods, specifically for the health benefits derived from eating the foods.

One of the main factors that contributes to poor diet quality in children is the lack of parental nutrition knowledge and self-efficacy of parents to feed their children nutritious foods to meet their needs (Vereecken, 2004). Previous research has found that parental knowledge that is measured objectively through questions about appropriate recommendations and healthier food choices plays a large role in the overall nutrient value of their children's diets (Gibson, Wardle, & Watts, 1998), with little to no research analyzing the influence of self-reported nutrition

knowledge of parents. Somewhat related, this study on subjectively measured nutrition knowledge found that the more knowledgeable about nutrition a parent is, the more likely they are to feed functional foods with benefits related to digestive health, weight management, cancer prevention, heart health, and other foods to their children. Since parents are the primary providers of food to children, possessing the knowledge of appropriate recommendations for children has been suggested to be important (Savage et al., 2007). Present research has indicated that the "carrier" product of the function was important to parents when awareness of function was low (Krystallis & Chrysochou, 2012); therefore, educating parents on the health benefits that may be obtained from specific nutritious functional foods and increasing their self-efficacy would increase the likelihood of integration of these foods into the diets of their children (Wansink et al., 2005). Since parental knowledge, whether subjective or objective, plays a significant role in the nutritional quality of a child's diet (Vereecken, 2004), assisting parents in obtaining self-efficacy related to nutrition knowledge is mandatory in promoting and maintaining dietary habits that are continued through the lifespan.

Interestingly, parent's self-reported nutritional knowledge, along with the other independent variables, was not found to have a significant correlation with the functional type of bone health. Calcium and Vitamin D intake during childhood and adolescence are said to have a significant impact on bone development and health (Rizzoli, Bianchi, Garabedian, McKay, & Moreno, 2010). Contrary to the findings of this study, other research has suggested that parental concern for diet quality in children and parental knowledge and attitudes have played significant roles in the increase of milk and dairy products in their child's diet (Goh & Jacob, 2011; MSI, 2012; Sloan, 2014). The home food environment plays a powerful role in the establishment of dietary habits in children (MacFarlane et al., 2010); therefore, parents should be diligent in the

promotion of foods that have a significant impact on bone development in childhood and adolescence. This lack of impact of any independent variables on the provision of calcium and vitamin D to children can be attributed to the high usage of calcium and Vitamin D specific functional foods; 86.1% of parents in the study reported feeding their children both calcium and vitamin D, while 9.9% of parents reported feeding their child one of these foods for bone health. Therefore, parental attitudes, self-reported knowledge, self-reported health status, and concern over their children's diet made no difference in the feeding of functional foods with benefits related to bone health to children because parents were already feeding their children these functional foods.

When parent's attitude towards functional foods, parent's personal health, and concern over their child's diet were examined, none were found to have a significant impact on the feeding of functional foods to their children. These findings were inconsistent with existing literature that demonstrated that nutrient content of foods was the most important indicator of food choices for children, as well as that parents who were less concerned with their children's diets were less likely to purchase nutrient-dense food (Hughner & Maher, 2006). A possible explanation of the lack of correlation among concern of parents and feeding of functional foods could be explained by existing literature. In the same study by Hughner & Maher (2006), many parents who reported concern with their children's diets did not report feeding children foods specifically for the benefit it provided, but rather relied on providing a variety of foods to fit the nutrient needs of children.

Whether parents agreed or disagreed that certain foods provide health benefits beyond basic nutrition did not make a difference in the feeding of specific functional food types to their children. Previous research suggests that the higher the acceptance of and belief in functional

foods, the more likely an adult was to consume them (Siegrist et al., 2008). The International Food Information Council (2009) reported findings that 60% of Americans consume health foods for specific benefits, and at least 55% chose foods specifically for heart health or to maintain a healthy body weight. Findings of this particular study could be supported by the fact that many consumers rely on the social trust of the food industry (Urala et al., 2003), and that instead of relying on specific food products to deliver benefits to the diets of their children, parents trust and rely on the health claim labels that food corporations use to market their products. While knowledge of nutrition is of great importance in the feeding of functional foods to children, the survival of the functional foods market relies solely on the belief that consumers derive benefit from the consumption of these types of foods (Vella et al., 2014); therefore, parental awareness of functional foods is critical for the survival of this developing market, as well as for an increase in parents feeding their children functional foods to protect and encourage a healthy lifestyle.

It was surprising to find that despite a parent's self-reported level of overall health, there were no significant results related to feeding children functional foods to promote a variety of health factors. Adopting a healthy lifestyle and modeling nutritious eating for children can encourage consumption of nutrient-dense food among children (Rhee, 2008). Previous literature suggests that children report consuming a larger amount of fruits and vegetables, as well as lower amounts of saturated fats, when their parents reported eating those same types of food (Fisher, Mitchell, Smiciklas-Wright, & Birch, 2002; Tibbs et al., 2001). Therefore, it could be assumed that if parents consider themselves to have an overall healthy lifestyle, their children would be healthy, as well. A possible explanation of conflicting findings in this study could be explained by different food preferences of children when compared with their parents. Whether parents report a positive or negative view of their own health, many may feel as though they have no

control over what their children will or will not eat, and may often find themselves negotiating with their children during meal and snack times (Adamo & Brett, 2014; Dixon & Banwell, 2004; Finistrella et al., 2012; Roberts, 2006; Sutherland et al., 2008; Wansink, 2006).

Limitations. Findings in this study should be noted with a few limitations. The sample size was small compared to the target population; this could have happened for multiple reasons. The data collection period was only one month in length; a longer data collection time could have allowed for more participants and responses. During the data collection period, the North Mississippi region experienced multiple days of inclement weather that prohibited flyers and announcements from being distributed due to school cancellations. It should also be noted that the Tupelo Public School District only distributed the survey via email at the beginning of the data collection period, when it was originally understood it would be distributed once per week for four weeks. Working within school requirements can be difficult, so finding school administrators that are willing to work within the researcher's criteria upfront is crucial.

The length of the survey with a fairly large number of functional foods could have intimidated potential participants, and appeared to result in a large amount of dropout participants recorded in the data. However, the point in the survey at which the largest rate of dropouts occurred was Question 4C, a question that was unique and vital to the study; therefore, shortening the survey would not have been possible. Finally, it should be noted that this study may not be generalizable to the entire population. This study was only conducted in the North Mississippi region of the country; therefore, results of this study may not be applicable to the general public in other areas of the country or world. Possible future studies could consider different influential predictors as dependent variables, as well.

Conclusions. This study contributes to existing literature by examining factors that influence parents in feeding their children functional foods. Results of this study found that self-reported parental knowledge of nutrition plays a direct role in the feeding of functional foods to their children; therefore, future interventions should focus on parental education of nutrition and the role functional foods play in a nutritious diet, specifically in the diets of children. Functional food product marketers could deliver this type of education by providing educational content on food labels, since it was previously mentioned that many parents rely on the social trust of the food industry in the food product labels and claims (Urala et al., 2003). Information and promotion campaigns targeted towards parents could also increase parents' self-efficacy in their knowledge of nutrition.

Although this study and the IFIC (2013) reported that a significant number of the general public agree that certain foods provide benefits beyond basic nutrition (90%), it could be argued that the term "functional food" may still be too unfamiliar to many. As the term becomes more commonly used in describing specific types of healthy foods, perhaps parental attitudes, overall self-reported health, and concern for children's diets will have a stronger influence in determining the types of functional foods that parents feed their children, as well as to enhance and protect health of children.

LIST OF REFERENCES

List of References

Academy of Nutrition and Dietetics (2013). Position of the academy of nutrition and dietetics: Functional foods. *Journal of the Academy of Nutrition and Dietetics, 113*(8), 1096-1103.

Adamo, K.B., & Brett, K.E. (2014). Parental perceptions and childhood dietary quality. *Maternal and Child Health Journal, 18,* 978-995.

Ares, G., Giménez, A., & Gàmbaro, A. (2008). Influence of nutritional knowledge on perceived healthiness and willingness to try functional foods. *Appetite, 51,* 663-668.

Bech-Larsen, T., & Grunert, K. G. (2003). The perceived healthiness of functional foods-A conjoint study of Danish, Finnish and American consumers' perception of functional foods. *Appetite, 40*, 9–14.

Bech-Larsen, T., & Scholderer, J. (2007). Functional foods in Europe: Consumer research, market experiences and regulatory aspects. *Trends in Food Science & Technology, 18*, 231–234.

Birch, L.L. (1980a). Effects of peer models' food choices and eating behaviors on preschoolers' food preferences. *Child Development, 51,* 489-496.

Birch, L.L. (1980b). The relationship between children's food preferences and those of their parents. *Journal of Nutrition Education, 12,* 14-18.

Birch, L.L., & Davison K.K. (2001). Family environmental factors influencing the developing behavioral controls of food intake and childhood overweight. *Pediatric Clinics of North America, 48*(4), 893-907.

Bowman, S.A. (2002). Beverage choices of young females: Changes and impact on nutrient intakes. *Journal of the American Dietetic Association, 102,* 1234-1239.

Bowman, S.A., Gortmaker, S.L., Ebbeling, C.B., Pereira, M.A., & Ludwig, D.S. (2004). Effects of fast-food consumption on energy intake and diet quality among children in a national household survey. *Pediatrics, 113,* 112-118.

Campbell, K.J., Abbott, G., Spence, A.C., Crawford, D.A., McNaughton, S.A., & Ball, K. (2013). Home food availability mediates associations between mothers' nutrition knowledge and child diet. *Appetite, 71,* 1-6.

Cluskey, M., Edlefsen, M., Olson, M.R., Auld, G., Bock, M.A., Boushey, C.J.,…Zaghloul, S. (2008). At-home and away-from-home eating patterns influencing preadolescents' intake of calcium-rich food as perceived by Asian, Hispanic, and non-Hispanic white parents. *Journal of Nutrition Education and Behavior, 40*(2), 72-79.

Crites, S. L., Jr., & Aikman, S. N. (2005). Impact of nutrition knowledge on food evaluations. *European Journal of Clinical Nutrition, 59*, 1191–1200.

Cullen, K.W., Baranowski, T., Rittenberry, L., Cosart, C., Hebert, D., & de Moor, C. (2003). Child-reported family and peer influences on fruit, juice, and vegetable consumption: Reliability and validity of measures. *Health Education Research. 16,* 187-200.

Dean, M., Lampila, P., Shepherd, R., Arvola, A., Reis, A.S., Vassallo, M., et al. (2012). Perceived relevance and foods with health-related claims. *Food quality and Preference, 24*, 129-135.

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

Dixon, J., & Banwell, C. (2004). Heading the table: Parenting and the junior consumer. *British Food Journal, 105*(3), 182-193.

Drucker, R.R., Hammer, L.D., Agras, W.S., Bryson, S. (1999). Can mothers influence their child's eating behavior? *Journal of Behavioral and Developmental Pediatrics, 20,* 88-92.

Euromonitor (2014). *Health and wellness performance overview 2013*. Retrieved from http://www.euromonitor.com

Finistrella, V, Manco, M., Ferrara, A., Rustico, C., Presaghi, F., & Morino, G. (2012). Cross-sectional exploration of maternal reports of food neophobia and pickiness in preschooler-mother dyads. *Journal of the American College of Nutrition, 31*(3), 152-159.

Fisher, J.O., Mitchell, D.C., Smiciklas-Wright, H., & Birch, L.L. (2002). Parental influences on young girls' fruit and vegetable, micronutrient, and fat intakes. *Journal of the American Dietetic Association, 102,* 58-64.

Francis, L., & Birch, L. (2005). Maternal weight status modulates the effect of restriction on daughters' eating and weight. *International Journal of Obesity, 29,* 942-949.

Frewer, L., Scholderer, J., Lambert, N. (2003). Consumer acceptance of functional foods: Issues for the future. *British Food Journal, 105,* 714-731.

Gibson E.L., Wardle J., & Watts, C.J**.** (1998). Fruit and vegetable consumption, nutrition knowledge and beliefs in mothers and children. *Appetite*, 31, 205-28.

Gillman, M. W., Rifas-Shiman, S. L., Frazier, A. L., Rockett, H. R., Camargo, C. A., Jr., Field, A. E.,…Colditz, G.A. (2000). Family dinner and diet quality among older children and adolescents. *Archives of Family Medicine, 9*(3), 235–240.

Goh, D.Y.T., & Jacob, A. (2011). Children's consumption of beverages in Singapore: Knowledge, attitudes, and practice. *Journal of Pediatrics and Child Health, 47,* 465-472.

Harper, A.E. (1999). Nutrition essentiality: Evolution of the concept. *Nutrition Today, 34,* 216-222.

Hendy, H. (2002). Effectiveness of trained peer models to encourage food acceptance in preschool children. *Appetite, 39*(3), 217-225.

Hudson, C., Stotts, R. C., Pruett, J., & Cowan, P. (2005). Parents' diet-related attitudes and knowledge, family fast food dollars spent, and the relation to BMI and fruit and vegetable intake of their preschool children. *Southern Online Journal of Nursing Research*, *6*(5), 1–23.

Hughner, R.S., & Maher, J.K. (2006). Factors that influence parental food purchases for children: Implications for dietary health. *Journal of Marketing Management, 22,* 929-954.

IBM Corp. Released 2013. IBM SPSS Statistics for Macintosh, Version 22.0. Armonk, NY: IBM Corp.

Institute of Medicine. (2011). Obesity prevention policies for young children. L.L. Birch & A.C. Burns (Eds.); Committee on Obesity Prevention Policies for Young Children. Washington, DC: National Academies Press.

International Food Information Council. (2009). *Functional Foods/Foods for Health Consumer Trending Survey [Data File]*. Retrieved from http://www.foodinsight.org/2009_Functional_Foods_Foods_For_Health_Consumer_Trending_Survey_Executive_Summary

International Food Information Council. (2013). Functional Foods Consumer Survey [Data File]. Retrieved from http://www.foodinsight.org/Content/3840/FINAL%20FF%20Executive%20Summary%209-30-13.pdf

Johnson, S.L., & Birch, L.L. (1994). Parents' and children's adiposity and eating style. *Pediatrics, 94,* 653-661.

Jonas, M. S., & Beckmann, S. C. (1998). Functional foods: Consumer perceptions in Denmark and England. MAPP Working Paper No. 55.

Kapsak, W.R., Rahavi, E.B., Childs, N.M., & White, C. (2011). Functional foods: Consumer attitudes, perceptions, and behaviors in a growing market. *Journal of the American Dietetic Association, 111*(6), 804-810.

Klesges, R.C., Coates, T.J., Brown, G., Sturgeon-Tillisch, J., Moldenhauer-Klesges, L.M., Holzer, B.,…Vollmer, J. (1983). Parental influences on children's eating behavior and relative weight. *Journal of Applied Behavior Analysis, 16,* 371-378.

Klesges, R.C., Stein, R.J., Eck, L.H., Isbell, T.R., Klesges, L.M. (1991). Parental influence on food selection in young children and its relationships to childhood obesity. *American Journal of Clinical Nutrition, 53,* 859-864.

Koivisto, U.K., Fellenius, J., & Sjoden, P.O. (1994). Relations between parental mealtime practices and children's food intake. *Appetite, 22,* 245-257.

Krygier, K. (2007). Functional foods in Poland. In *Proceedings of the fourth international FFNet meeting on functional foods.*

Krystallis, A., & Chrysochou, P. (2012). Do health claims and prior awareness influence consumers' preferences for unhealthy foods? The case of functional children's snacks. *Agribusiness, 28*(1), 86-102.

Larson, N., Fulkerson, J., Story, M., & Neumark-Sztainer, D. (2013). Shared meals among young adults are associated with better diet quality and predicted by family meal patterns during adolescence, *Public Health Nutrition, 16*(5), 883-893.

Lee, S., & Reicks, M. (2003). Environmental and behavioral factors are associated with the calcium intake of low-income adolescent girls. *Journal of the American Dietetic Association, 103*(11), 1526-1529.

MacFarlane, A., Crawford, D., & Worsley, A. (2010). Associations between parental concern for adolescent weight and the home food environment and dietary intake. *Journal of Nutrition Education and Behavior, 42*(3), 152-160.

MSI (2012). The 2012 Gallup study of children's nutrition and eating habits.

Nielsen, S.J., & Popkin, B.M. (2003). Patterns and trends in food portion sizes, 1977-1998. *The Journal of the American Medical Association, 289*(4), 450-453.

Nielsen, S., Siega-Riz, A., & Popkin, B. (2002). Trends in energy intake in U.S. between 1977 and 1996: Similar shifts seen across age groups. *Obesity Research, 10*(5), 370-378.

Niva, M. (2007). "All foods affect health". Understandings of functional foods and healthy eating among health-oriented Finns. *Appetite, 48*, 384-393.

Patterson, R., Kristal, A., Lynch, J., & White, E. (1995). Diet-cancer related beliefs, knowledge, norms and their relationship to healthful diets. *Journal of Nutrition Education, 27*(2), 86-92.

Patterson, R.E., Typpo, J.T., Typpo, M.H., & Krause, G.F. (1991). *Factors related to obesity in preschool children, 86,* 1376-1381.

Peters, J., Dollman, J., Petkov, J., & Parletta, N. (2012). Associations between pareting styles and nutrition knowledge and 2-5-year-old children's fruit, vegetable and non-core food consumption. *Public Health Nutrition, 16*(11), 1979-1987.

Petrunoff, N.A., Wilkenfield, R.L., King, L.A., & Flood, V.M. (2012). 'Treats,' 'sometimes foods,' 'junk': A qualitative study exploring 'extra foods' with parents of young children. *Public Health Nutrition, 17*(5), 979-986.

Poulsen, J. B. (1999). Danish consumers' attitudes towards functional foods. Working Paper No. 62. Aarhus, Denmark: MAPP.

Rezai, G., Teng, P.K., Mohamed, Z., & Shamsudin, M.N. (2014). Structural equation modeling of consumer purchase intention toward synthetic functional food. *Journal of Food Products Marketing, 20,* 13-34.

Rhee, K. (2008). Childhood overweight and the relationship between parent behaviors, parenting style, and family functioning. *The ANNALS of the American Academy of Political and Social Science, 615,* 12-37.

Rizzoli, R., Bianchi, M.L., Garabedian, M., McKay, H.A., & Moreno, L.A. (2010). Maximizing bone mineral mass gain during growth for the prevention of fractures in the adolescents and the elderly. *Bone, 46*, 294-305.

Roberts, E.M. (2006). Negotiating food choice: Parents' perception of children's eating behavior. *Anthropological Notebooks, 12*(1), 63-77.

Rolls, R.J., Engell, D., & Birch, L.L. (2000). Serving portion size influence 5-year-old but not 3-year-old children's food intakes. *Journal of the American Dietetic Association, 100*(2), 232-234.

Roos, E., Lehto, R., & Ray, C. (2012). Parental family food choice motives and children's food intake. *Food Quality and Preference, 24,* 85-91.

Ross, S. (2000). Functional foods: The Food and Drug Administration perspective. *American Journal of Clinical Nutrition, 71*(6), 1735-1738.

Savage, J.S., Fisher, J.O., & Birch, L.L. (2007). Parental influence on eating behavior: Conception to adolescence. *The Journal of Law, Medicine, and Ethics, 35*(1), 22-34.

Siegrist, M., Stampfli, N., & Kastenholz, H. (2008). Consumers' willingness to buy functional foods. The influence of carrier, benefit, and trust. *Appetite, 51,* 526-529.

Siró, I., Kàpolna, E., Kàpolna, B., & Lugasi, A. (2008). Functional food. Product development, marketing and consumer acceptance—A review. *Appetite, 51,* 456-467.

Sloan, A.E. (2014). The top ten functional food trends. *Food Technology, 68*(4), 1-32.

Slusser, W., Erausquin, J.T., Prelip, M., Fischer, H., Cumberland, W.G., Frankel, F., & Neumann, C. (2012). Nutrition knowledge and behaviours of low-income Latino parents of preschoolers: Associations with nutrition-related parenting practices. *Early Child Development and Care, 182*(8), 1041-1055.

Sutherland, L.A., Beavers, D.P., Kupper, L.L., Bernhardt, A.M., Heatherton, T., & Dalton, M.A. (2008). Like parent, like child: Chile food and beverage choices during role playing. *Archives of Pediatrics and Adolescent Medicine, 162*(11), 1063-1069.

Tibbs, T., Haire-Joshu, D., Schechtman, K.B., Brownson, R.C., Nanney, M.S., Houston, C., & Auslander, W. (2001). The relationship between parental modeling, eating patterns, and dietary intake among African-American parents. *Journal of the American Dietetic Association, 101,* 535-541.

Urala, N., Arvola, A., & Lähteenmäki, L. (2003). Strength of health-related claims and their perceived advantage. *International Journal of Food Science and Technology, 38*, 815–826.

Urala, N., & Lähteenmäki, L. (2004). Attitudes behind consumers' willingness to use functional foods. *Food Quality and Preference, 15,* 793-803.

Variyam, J.N. (2001). Overweight children: Is parental nutrition knowledge a factor? *FoodReview, 24*(2), 18-22.

Vella, M.N., Stratton, L.M., Sheeshka, J., & Duncan, A.M. (2014). Functional food awareness and perceptions in relation to information sources in older adults. *Nutrition Journal, 13*(44), 1-25.

Vereecken, C.A., Keukelier, E., Maes, L. (2004). Influence of mother's educational level on food parenting practices and food habits of young children. *Appetite, 43*(1), 93–103.

Vereecken, C., Legiest, E., De Bourdeaudhuij, I., Maes, L. (2009). Associations between general parenting styles and specific food-related parenting practices and children's food consumption. *American Journal of Health Promotion, 23*(4), 233-240.

Wansink, B. (2006). Nutritional gatekeepers and the 72% solution. *Journal of the American Dietetic Association, 106*(9), 1324-1327.

Wansink, B., Westgren, R.E., & Cheney, M.M. (2005). Hierarchy of nutritional knowledge that relates to the consumption of a functional food. *Nutrition, 21,* 264-268.

Wardle, J., Parmenter, K., & Waller, J. (2000). Nutrition knowledge and food intake. *Appetite, 34,* 269-275.

Wardle, J., Sanderson, S., Guthrie, C.A., Rapoport, L., & Plomin, R. (2002). Parental feeding style and the intergenerational transmission of obesity risk. *Obesity Research, 10*(6), 453-462.

Young, E.M., Fors, S.W., & Hayes, D.M. (2004). Associations between perceived parent behaviors and middle school student fruit and vegetable consumption. *Journal of Nutrition Education Behavior, 36*(1), 2-8.

LIST OF APPENDICES

APPENDIX A

1. Please indicate your agreement or disagreement with this statement:
   "Certain foods have health benefits beyond basic nutrition."
   a. Strongly disagree
   b. Somewhat disagree
   c. Somewhat agree
   d. Strongly agree
   e. Don't know

2. How concerned are you by the possibility that your children are not getting enough of the nutrients and food components that are needed for good health?
   a. Not at all concerned
   b. Slightly concerned
   c. Somewhat concerned
   d. Very concerned

3. How knowledgeable do you consider yourself in the area of nutrition?
   a. Extremely knowledgeable
   b. Very knowledgeable
   c. Somewhat knowledgeable
   d. A little knowledgeable
   e. Not knowledgeable

	Food Components or Nutrients	4C. Do you currently feed your children **this food for that health condition?**	
1.	**Antioxidants** (found, for example, in fruits and vegetables, whole grains, dark chocolate, and certain teas and spices) **for protection against free radical damage associated with aging and various chronic diseases.**	Yes	No
2.	**Lycopene** (found, for example, in processed tomato products, such as tomato sauce) **for reduced risk of prostate cancer.**	Yes	No
3.	**Lutein and other carotenoids** (found, for example, in spinach and fortified foods and beverages) **for maintaining eye health.**	Yes	No
4.	**Calcium** (found, for example, in dairy foods such as milk, cheese, yogurt, or in calcium-fortified foods or beverages) **for the promotion of bone health (and for reduced risk of osteoporosis).**	Yes	No

5. **Monounsaturated fats** (found, for example, in olive oil and nuts) **for reduced risk of heart disease.**	Yes	No
6. **Plant sterols** (found, for example, in fortified foods and beverages, including table spreads, juices, and yogurt) **for reduced risk of heart disease.**	Yes	No
7. **Potassium** (found, for example, in fruits, vegetables, and juices) **for reduced risk of high blood pressure and stroke.**	Yes	No
8. **Prebiotic fiber** (found, for example, in certain fruits, vegetables, and fortified foods) **for maintaining a healthy digestive system.**	Yes	No
9. **Vitamin D** (found, for example, in fortified foods and beverages, such as dairy products, cereals, and juices) **for the promotion of bone health (and for reduced risk of osteoporosis).**	Yes	No
10. **Xylitol** (found, for example, in sugar-free chewing gums) **for maintaining oral health.**	Yes	No
11. **Herbs and spices used to season foods** (for example, cinnamon, red pepper, and oregano) **for reduced risk of chronic diseases and/or weight management.**	Yes	No
12. **B vitamins** (found, for example, in meats, whole grains, vegetables, and nuts) **for reduced risk of heart disease.**	Yes	No
13. **Whole grains** (found, for example, in whole-grain cereals, breads, rice, or pasta) **for reduced risk of heart disease.**	Yes	No
14. **Fiber** (found, for example, in vegetables, fruits, some breads, cereals, and fortified foods and beverages)		
14a. **Fiber for reduced risk of heart disease.**	Yes	No
14b. **Fiber for weight management and to provide a feeling of fullness.**	Yes	No
14c. **Fiber for maintaining a healthy digestive system.**	Yes	No
14d. **Fiber for reduced risk of cancer.**	Yes	No
15. **Protein** (found, for example, in meat, dairy, beans, nuts, soy, and some fortified foods and beverages)		
15a. **Protein for weight management and to provide a feeling of fullness.**	Yes	No
15b. **Protein for maintaining optimal health.**	Yes	No
16. **Soy/soy protein** (found, for example, in soy-based products such as meat alternatives, nutritional bars, and beverages, such as soymilk).		
16a. **Soy/soy protein for reduced risk of cancer.**	Yes	No
16b. **Soy/soy protein for reduced risk of heart disease.**	Yes	No
17. **Folate or folic acid** (found, for example, in fortified grain products and citrus juices).		
17a. **Folate for reduced risk of brain or spinal cord (neural tube) birth defects.**	Yes	No
17b. **Folate for reduced risk of heart disease.**	Yes	No

18. **Omega-3 fatty acids** (found, for example, in seafood, fish oil, or fortified		
18a. **Omega-3 fatty acids for reduced risk of heart disease.**	Yes	No
18b. **Omega-3 fatty acids for cognitive development, especially in children.**	Yes	No
19. **Probiotics** (found, for example, in yogurt and other products with beneficial cultures).		
19a. **Probiotics for maintaining a healthy digestive system.**	Yes	No
19b. **Probiotics for maintaining a healthy immune system.**	Yes	No

11. In general, would you say your overall health is …
    a. Poor
    b. Fair
    c. Good
    d. Very good
    e. Excellent
    f. Don't know

APPENDIX B

Parents – we need your help!

The nutritional health of children *today* will impact *the rest of their lives*. With just a few minutes of your time, you can **help us with a graduate study** that may make a difference in improving the health and well being of children in Northern Mississippi and nationwide.

The study focuses on foods that provide health benefits beyond basic nutrition to children in hopes of understanding the affect they have on the health of children in Northern Mississippi.

If you are a parent of a child 18 years of age or younger, please go to the website www.kidsfood.us to participate in our survey. It will only take about 10 minutes to complete.

If you do not have access to a computer or would prefer to complete a paper copy of the survey, please call or text Lauren at (662) 397-5385 with your name and mailing address.

This study has been reviewed by The University of Mississippi's Institutional Review Board (IRB). If you have any questions, concerns, or reports regarding your rights as a participant of research, please contact the IRB at (662) 915-7482 or irb@olmiss.edu.

In advance, we thank you for your time and participation in our study!

VITA

Lauren Elizabeth Guy

EDUCATION

B.S., Nutrition & Dietetics, University of Mississippi, August 2013

EXPERIENCE

Teaching Assistant, Spring 2015
University of Mississippi
Courses: Nutrition (NHM 311) & ServSafe (NHM 111)

RebelWell Graduate Assistant, Fall 2014
University of Mississippi

Beat the MetS Health Coach
Interactive Health
General Electric, Batesville, MS

Health Advisor Graduate Assistant, 2013-2014
General Electric, Batesville, MS

HONORS

Phi Kappa Phi Honor Society, 2013