Consumer Perception of Health Based on Packaging

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**Abstract**

 This research study sought to uncover consumer’s perception of the overall healthiness of a product based solely on packaging, price and previous knowledge and experience with the brand/product. The researchers sought to gain a better understanding of these perceptions through a paper survey that required participants to give information about their own health, their perceptions of nutrient claims, information regarding the subset being analyzed (granola) and basic demographics. Results of the study showed that the health claims “all natural” and “organic” were indicators of a high level of overall health. Less than ten percent of the sample was able to correctly identify which product was the healthiest.

**Introduction**

Nutrition is information that has always been relevant to the general public. Recently, people have begun to care more about their health and nutrition. According to the study “Nutrition and You: Trends 2011,” in 1991, 25 percent of people said that they were already maintaining a healthy diet and regular exercise. The 2011 data revealed that more than 40 percent of people surveyed felt they met these criteria (American Dietetic Association, 2011).

Another chart from the same study revealed that 89 percent of people in 2011 said that diet and nutrition are very important to them, compared to 79 percent of those surveyed in 1991 (American Dietetic Association, 2011). This study clearly shows that people care more now about their health and nutrition than they did 20 years ago.

Perhaps the most striking data collected from this survey, however, is the consumers’ desire for information regarding what is in the products they consume. Forty-six percent of those surveyed say that they “actively seek information about nutrition and healthy eating,” a 27 percent increase since the baseline taken in 1991 (American Dietetic Association, 2011).

Specific to deception, in recent years lawsuits have risen about the deceiving packaging and marketing surrounding foods. In April 2011, a consumer filed a lawsuit against Ferrera USA, claiming that their advertising for Nutella implied that the product was a health food. After discovering that a serving of the product contained 200 calories, 11g of fat and 21g of sugar, the consumer sued and won the $3 million lawsuit (Flahardy, 2012).

Over time, people's attitudes have changed regarding the food they put into their bodies. The USDA published the first guide of dietary advice in 1894 (Social Issues Research Centre, n.d.). The 20th century saw the rise of research to standardize ratios for proper height and body weight. This was followed by new research that helped implement recommended dietary allowances in 1941. Known as “the year of the diet,” 1981 saw the rise of “fad” diets, including the Beverly Hills Diet. Dr. Atkins’ also released his first book, *New Diet Revolution*, this year as well. Research is continually being done, demonstrating the obvious need and desire for accurate and plentiful information on the topic.

 While proper nutrition is extremely rewarding for the body, food can be deadly. In the National Vital Statistics Report, 56 percent of deaths were due to nutrition-related diseases (Mimino et al., 2011). Four nutrition-related diseases were in the top seven of the list. Food manufacturers use deceptive packaging to make it difficult for people to decipher what foods they can rely on to not make them a part of this statistic. By researching this topic, awareness will be brought to consumers, helping them make informed decisions about the foods they put in their bodies.

 A large majority of foods favored by consumers use deceptive messaging and packaging to sway sales. Even simple claims on packages stating ingredients used in the product can be deceptive. Almond milk, a dairy-free milk alternative that started popping up in stores in 2010, appears to have a great deal of benefits. A one-cup serving of original Silk almond milk contains “60 calories per serving” and is “rich in vitamins and antioxidants” such as vitamin E. Silk credits these spectacular health benefits to almonds; a serving of almonds, in their raw form, provide 6g of protein and pack a hefty 22g of fat. Silk’s almond milk provides 2.5 grams of fat, which would amount to “about four nuts” (Liebman, 2010, p.9).

 Stonyfield Farms, the organic counterpart of Dannon yogurt, markets their Strawberry Stratosphere YoSqueeze tubes of yogurt by covering the box in pictures of ripe, juicy strawberries. Upon reading the label, however, the consumer can easily spot one thing missing from the ingredients list: actual strawberries. To achieve its pink color, Stonyfield uses beet juice concentrate and “natural flavors” to simulate a strawberry color and flavor. No actual strawberries are used in the making of this product (Liebman, 2001, p.10).

 This project aims to reveal the variety of deceptive claims made on food labels and packaging, focusing on four main research questions:

* Are higher priced items perceived to be healthier than cheaper alternatives?
* Of the following health claims (organic, low fat, non-fat, all natural, low carbohydrate, high fiber, high protein and low sugar), which one gives the consumer the greatest impression that a product will be healthy?
* Do “earthy” design elements, such as earthy colors, cool tones and nature imagery lead to a higher perception of health?
* How much of the granola that is perceived to be healthy actually meets the FDA guidelines for healthy foods?

**Literature Review**

 Extensive research and other data have been published regarding health and nutrition. This data extends centuries; there are records collected of nutrition practices and concerns in prehistoric times. Understanding this official and unofficial research and experimentation is crucial in order to understand the atmosphere of a modern-day grocery store, as well as the various health claims. Without these progressions, these claims could potentially have vastly different connotations.

 Early human ancestors learned largely through trial and error, experimenting with nutritional combinations to learn how certain foods reacted with their bodies (Social Issues Research Centre, n.d.; Harper, 2000). Through their experiments, they were able to determine what items were nutritional and which items caused illness and occasionally death. This trial-and-error was transmitted orally throughout the communities and can be viewed as the earliest form of dietary advice (Social Issues Research Centre, n.d.; Harper, 2000).

 Between 12,000-5,000 B.C., livestock were domesticated and people began growing crops around the world (Harper, 2000; Social Issues Research Centre, n.d.). With food sources diversified, dietary restrictions began appearing; the first documented avoidance arose in Egypt in 3200 B.C. with a majority of the population avoiding pork (Grivetti, 2000; Social Issues Research Centre, n.d.). Over the next 100 years, the Egyptians began experimenting with the vegetation they had available. An inscription on one of the pyramids of Giza describes the quantity of radishes, onions and garlic consumed by the workers (Social Issues Research Centre, n.d.). It is interesting to note that all three of these items were later found to have some form of medicinal purpose and, from this point forward, simple nutritional research (eating and observing) began spreading around the world (Harper, 2000; Social Issues Research Centre, n.d.; Ivanovics & Horvath, 1947).

 Dietary fads are noted as early as 500 B.C., with both athletes and warriors being known to alter their diets for performance, specifically by eating lion heart and deer liver (Applegate & Grivetti, 1997; Social Issues Research Centre, n.d.).

 Research surrounding “miracle” ingredients with plentiful health benefits began in 175 B.C. Cato, a Roman statesman, adamantly promoted the healing benefits of cabbage, going so far to say that ingesting cabbage or the urine of a person who had eaten cabbage would cure dysentery, indigestion, drunkenness, ulcers and warts (Whelan & Stare, 1992; Social Issues Research Centre, n.d.). This is arguably the first time a deceptive marketing claim was used. Cabbage did not have any of the benefits Cato suggested, although he continued to trust its “powers” even after his “cabbage diet” killed his wife and son (Whelan & Stare, 1992; Social Issues Research Centre, n.d.).

 “Miracle” ingredients have evolved over time. Following Cato’s cabbage diet came advice from a prominent Italian doctor to drink walnut juice (Whelan & Stare, 1992). In 1790, the inclusion of citrus juices in British Navy Sailor’s rations became a standard practice to combat scurvy (Harper, 2000; Social Issues Research Centre, n.d.). Garlic was given fame in the 1940s for its ability to raise low blood pressure, clean out intestines and cleanse blood (Whelan & Stare, 1992; Social Issues Research Centre, n.d.). The 10-year span between 1962 and 1972 saw a spike in interest in the role of fiber in a person’s diet (Le Fanu, 1991; Southgate, 1992). These trendy “miracle” ingredients, or “superfoods” as they’re often referred to in the twenty-first century, often imply health benefits throughout a product when the proposed beneficial ingredient often is only one small part of the product (Hassler, 2008).

 In accordance with the theology of the time, the practice of moderation and a universal fear of gluttony arose in 100 A.D. (Whorton, 1982; Harper, 2000; Social Issues Research Centre, n.d.). This fear sparked the initial recorded desire of people to be “healthy” and present day dietary guidelines are based off of these, providing guidelines for a healthy lifestyle with additional support given by scientific evidence (Harper, 2000). In 400 A.D., Anthimus, a Grecian doctor, provided a list of foods to avoid in order to be healthy, emphasizing that foods should be easily digestible and advising against foods still commonly avoided by those seeking to lose weight, such as cheeses and bacon-rind (Grivetti, 2000; Social Issues Research Centre, n.d.). Moderation was first “scientifically” proven to have merit in 1550 by Luigi Cornaro, who advised that indulging in large quantities of extravagant food would kill a man by age 40 (Whorton, 1982; Social Issues Research Centre, n.d.). He revised his diet and logged the way his body reacted to moderation. Living into his nineties, Cornaro is widely considered the “proven success story” of moderation and further instigated the quest for a healthy lifestyle (Whorton, 1982; Social Issues Research Centre, n.d.).

 Diets focused on various methodologies continued to gain popularity. As noted above, moderation and fasting for religious purposes is cited as the first “diet” (Whorton, 1982; Harper, 2000; Social Issues Research Centre, n.d.). Dieting trends and fads have affected the claims displayed on packaging, intended to provide marketing appeal. The time span just before the turn of the century has been referred to as “the golden age of food faddism,” and included heated debates between meat-eaters and vegetarians, groups who swore by not eating breakfast and individuals who claimed that raw foods were the answer to being healthy (Levenstein, 1993; Social Issues Research Centre, n.d.).

 These dieting trends directly influenced the products created and the ingredients advertised on food packaging and various marketing tactics (Kozup, Creyer & Burton, 2003). This is similar to the way these areas are designed now (Kelle, n.d.). Additionally, consumers are more likely to say that products are healthful, often times misreading actual nutrition labels, when these health claims (heart-healthy, no trans fat, sugar free) are presented (Kozup, Creyer & Burton, 2003; Nestle, 2006).

 Consumers’ drive to be healthy has risen 17 percent over the past 11 years (American Dietetic Association, 2011). In addition, the number of consumers who did not want to be bothered with their health has decreased significantly since 1991 (American Dietetic Association, 2011). Reacting to the desires of consumers, the claims regarding health benefits and “superfoods” on food packaging have become more plentiful and prevalent. Consumers have become wary of genetically modified organisms (GMO) and the non-GMO claim on products is widespread (Khan, Muafia, Nasreen & Salariya, 2012). Foods with “no trans fats” labels are perceived as healthy, as well as those containing flax seed, chia seed, whole grains, soy and oats, among others (Nestle, 2006; American Dietetic Association, 2011). Probiotics, the bacteria found in certain dairy products that has been shown to aid in digestion, has seen a jump in consumer interest over the past decade, along with the desire for food to be “natural” (American Dietetic Association, 2011; Nestle, 2006).

 Arguably the biggest fad of the twenty-first century revolves around organic products and farming procedures. This movement has inspired not only a nutrition trend but also a new section in most grocery stores. Stores targeted specifically for those interested in organics have also become profitable (i.e. Whole Foods, Trader Joe’s) (Barnes & O’Brien, 2012; Onyango, Hallman & Bellows, 2007). As covered later in this review, the FDA regulates the use of organic labels on products. Consumer attitudes regarding the healthiness of organic foods are positive; 45 percent of U.S. consumers believe that organic foods are “much healthier” than non-organic foods (American Dietetic Association, 2011). This is true despite the fact that an organic item often offers no extra health bonus beyond the disuse of chemicals in its production (Nestle, 2006).

 The list of low/high claims on food packaging has become extensive over the past 20 years. Claims such as low calorie, low fat, low cholesterol, high protein, high fiber, low glycemic index (GI), low sugar and low sodium are very commonly found on packaging but often offer no added level of health to the product (Nestle, 2006). Oftentimes, less desirable ingredients are added to a product to compensate for a loss in taste or to lengthen the shelf life of the item (Nestle, 2006).

In early 2011, the Grocery Manufacturers of America and the Food Marketing Institute created a voluntary nutrition-labeling system that companies could utilize on their products (Brownell, Kelly & Jeffrey, 2011). The purpose of creating this labeling system was to aid consumers in better understanding the food they purchase. The nutrition key can include up to six different types of information, displayed on a small bar on the front lower side of the package (Brownell, Kelly & Jeffrey, 2011). The key consists of calorie, fat and sugar content, as well as the option of listing two additional ingredients the manufacturer wishes to include, including vitamins, protein, fiber, etc. (Brownell, Kelly, & Koplan, 2011; Peraino, 2011). Although these labeling practices are catching on slowly, the food industry has taken a big step towards improving public health and awareness with these “easy-to-read” labels (Brownell, Kelly & Koplan, 2011; Peraino, 2011).

            A large majority of consumers are unfamiliar with the recommended daily amounts of various nutrients (Cowburn & Stockley, 2005). Food labels, both traditional and modern, give information in order to enlighten consumers in this department. While nutrition labels have been found helpful when choosing between two or more products, consumers generally think labels are confusing, specifically in regard to the role nutrients play in the human body (Cowburn & Stockley, 2005). Consumers lack basic knowledge of various food-based interactions, such as the relationship between carbohydrates and sugar (Cowburn & Stockley, 2005).

 In the United States, the highest ranked nutrition concern is fat content (Diekman & Malcolm, 2009). Ninety percent of the subjects indicated that they believed fat is bad to have in a diet (Diekman & Malcolm, 2009). When asked specifically what types of fat are bad to have in a diet, 52 percent of those surveyed could not identify which of the four types of fat were bad versus which had health benefits (Diekman & Malcolm, 2009, p. 28).

            Overall, consumers do not fully understand food labels on the packaging of products (Hasler, 2008). Fifty-nine percent of consumers say they are unable to decipher the numbers and symbols found on nutritional labels, oftentimes not reading past the fifth line (“Food labels confuse,” 2012). When narrowing down the subjects to citizens of the United States, the study also concluded that 58 percent of people admit to “mostly” understanding the information given on nutrition panels (“Food labels confuse,” 2012). Consumers also claim to review nutrition labels more thoroughly than they actually do, after comparing the self-reported statistics to data gathered from an eye-tracking device (“Food labels confuse,” 2012).

            The inclusion of genetically modified organisms (GMOs) in food, as mentioned previously, is a large point of concern for many consumers (Khan et. al, 2012). Currently, no regulation is set in place for labeling foods that have been genetically modified or those that contain genetically modified ingredients (“Guidance for Industry,” 2001; Khan et. al, 2012). The most commonly genetically engineered foods include soybean, corn, cotton, canola, squash, papaya and alfalfa (Khan et. al, 2012).

 Much debate exists as far as whether GMOs are good or bad to consume. Positive arguments for the use of GMOs include an increase in food production, a lower cost to the farmer and less pollution caused by pesticides and herbicides (Khan et. al, 2012). Argued disadvantages for the usage of GMOs include links to death, allergic reactions, cancer and antibiotic threats (Khan et. al, 2012).  At the current time, there is no government-mandated regulation about labeling foods containing genetically modified ingredients, nor is there any official FDA word regarding whether or not these modified ingredients pose a threat to overall health (“What’s the problem,” 2012).

 Serving sizes for different food products follow an FDA-mandated guide of suggestions, including various examples given in regards to specific products, such as one serving of ice being four ounces, a serving of coconut milk being 1/3 cup, etc. (U.S. Food, 2012b). There is, however, a set of required rules for which unit of measurement to use when listing the serving sizes of various products. On a food label, the serving size is composed of two different parts: a “household measure” and its metric equivalent in grams (g) or, if it is a beverage, fluid ounces or cups with the metric equivalent in millimeters (mL) (U.S. Food, 2012b).

 Without a specific standard for serving sizes per container, however, food manufacturers can confuse consumers. For example, according to the packaging for Annie Chun’s Noodle Bowls, “Annie Chun’s Noodle Bowls are Instant Gourmet Food, perfect for lunch or a quick dinner at your fingertips!” (Liebman, 2010, p.10). There is no mention that the “perfect” meal includes only half of the product, while the nutrition label clearly lists the serving size as two. A consumer who only considered the claim on the front of the package may walk away assuming that the product is a caloric bargain with only 230 calories as opposed to the true count of 460 calories per bowl (Liebman, 2010).

            The USDA provides specific regulations when it comes to the term “organic” and what products can be considered organic. According to a flyer compiled by the USDA, products need to be, “produced without excluded methods (e.g. genetic engineering), ionizing radiation, or sewage sludge, produced per the National List of Allowed and Prohibited Substances, and overseen by a USDA National Organic Program-authorized certifying agent, following all USDA organic regulations,” to be considered organic (USDA, 2012, para. 2). Products that are determined to be organic are allowed to include the USDA organic seal and must identify organic ingredients via an asterisk or other identifying mark (USDA, 2012).  In order to use the term “Made with organic ingredients” on food packaging, at least 70 percent of the product must be composed of certified-organic ingredients (USDA, 2012).

            Regulations also exist for food manufacturers when using general health claims on products. The FDA website provides a chart that consists of all the terms and requirements for all possible claims that a food manufacturer can make (“Appendix A,” 2009). The chart provides in-depth definitions regarding what standards food must meet in order to be considered “-free,” “low,” “reduced/less,” “light/lite” when referring to food (“Appendix A,” 2009).

 The table also includes different nutrients and the corresponding requirements for using each of the claim terms. For example, sodium content claims are broken down into different categories: “low in sodium,” “no salt added/unsalted” and “lightly salted” (“Appendix A,” 2009, para. 6). For an item to claim it is low in sodium, it must be reduced 50 percent per reference amounts customarily consumed (RACC) (“Appendix A,” 2009). The regulation for labeling foods “no salt added/unsalted” is the same, but additionally requires manufacturers to list on the packaging “this is not a sodium free food” (“Appendix A,” 2009, para. 6). For a food to be lightly salted, it must contain at minimum 50 percent less sodium than the RACC. Table 2 of Appendix B is taken from Appendix A of the FDA’s guidelines.

 The FDA also has a set of guidelines that manufacturers wishing to use the term “healthy” must abide by (U.S. Food, 2012b). Table 1 of Appendix B identifies what should be in specific foods in order for them to be “healthy.” If a food meets these requirements, food manufacturers can use terms such as “healthfulness,” “healthier” and others in the nutrition information section (U.S. Food, 2012b, para. 17).

 Nutrition is a consistently relevant topic. Recently, people have begun to care more about their health and nutrition. According to the study “Nutrition and You: Trends 2011,” in 1991, 25 percent of people said that they were already maintaining a healthy diet and regular exercise. The 2011 data revealed that more than 40 percent of people surveyed felt they met these criteria (American Dietetic Association, 2011).

 This quest to be healthy is complicated by food packaging and marketing claims. A large majority of foods favored by consumers use deceptive messaging and packaging to sway sales (Nestle, 2006; Liebman, 2010).

 This project aims to reveal the effect that health claims made on food labels and packaging have on consumers, focusing on four main research questions:

* Are higher priced items perceived to be healthier than cheaper alternatives?
* Of the following health claims (organic, low fat, non-fat, all natural, low carbohydrate, high fiber, high protein and low sugar), which one gives the consumer the greatest impression that a product will be healthy?
* Do “earthy” design elements, such as earthy colors, cool tones and nature imagery lead to a higher perception of health?
* How much of the granola that is perceived to be healthy actually meets the FDA guidelines for healthy foods?

**Method**

 The variables involved in this study were the various claims, packaging features and price of food items (independent) and the concept of a healthy product (dependent). To measure these variables, the researchers selected a subset of food items to gather data about. The research utilized six different brands of granola, each which identified specifically with a different health claim or had a reputation for following certain standards. The granola used was placed into categories based on the researcher’s perception. The categories constructed for each brand were as follows: Quaker Oats (popular), KIND (higher priced than average granola), Cascadian Farms (organic), Udi’s (gluten free), Kashi (made with genetically-modified grain products) and Hannaford’s own brand (store brand).

The operational definition of the term “healthy” in terms of this study has been defined by the FDA. The FDA’s guidelines for listing food products as healthy are listed in Appendix B, Table 1 (U.S. Food, 2009). The table describes the different total fat, saturated fat and cholesterol levels required for different products to list “healthy” on their packaging. Specific to the area the researchers are focusing on, section C of Table 1 defines what constitutes a healthy “enriched cereal-grain product,” which is the category that granola is defined under (U.S. Food, 2009). Healthy granola in this research study is defined by the following criteria:

* low fat (3g of fat or less, per Reference Amount Customarily Consumed [RACC])
* low in saturated fat (1g or less per RACC and contains 15% of total calories, or less, from saturated fat)
* low in cholesterol (less than 60 mg of cholesterol per RACC) (U.S. Food, 2012a).

The reference amount customarily consumed is also often referred to as the suggested serving size of a product. This value is determined by the FDA and is calculated by “conducting national food consumption surveys and taking the mean, median and mode of the amounts consumed to calculate a serving size” (Hilbink, n.d., para. 2). RACC’s are also adopted by the FDA from food manufacturers and distributors (Hilbink, n.d.).

The population studied was college students, specifically those that attend Utica College. Between 100-150 students were studied and the sample was a convenience sample. The researchers sat at a table at the base of the main staircase in the Utica College Ralph F. Strebel Student Center on two occasions within a week of each other and invited all students that passed by to participate.

There were no expected immediate or long-range risks involved in the study. Steps were taken to prevent unexpected risk. The researchers followed guidelines for informed consent, asked for minimally identifying information and only reported data in aggregate terms.

Data collection was conducted via survey. Participants filled out a paper survey consisting of 17 questions, including informed consent and qualifying questions, demographics and study-related material. These questions asked for general information about the subject’s perception of their own health, their perceptions of nutrient claims, information regarding the subset being analyzed (granola) and basic demographics (gender and age range). For a complete list of questions, please refer to Appendix A.

At least one survey question directly correlated to every research question. The researchers asked subjects about price, health claims and packaging design, and asked the subjects to rank the selected brands of granola in order of perceived healthiness.

The first three questions of the survey were qualifying questions, meant to deter those prospective subjects that were not willing to participate, under the age of 18 and/or not Utica College students. Questions 4, 5, and 6 were asked in order to ascertain the subjects’ own perception of their personal health. These questions were asked to determine if a correlation exists between the health of an individual and the way in which the individual perceives the healthiness of food. Question 8 was developed in order to establish how aware participants are of health labels previous to taking this survey, and question 10 asked participants to gather an indication of the subject’s awareness of cost. These questions further helped to more accurately illustrate whether the true indication of a healthy product came from the product itself or from a preconceived consumer mindset.

Question 9 was designed specifically to reflect views that are not the researchers. It has been reverse coded for these reasons. If a person answers that they regard taste as the most important consideration when purchasing a product, nutrition and health information will, obviously, not be the most important consideration for them.

Question 10 was asked to determine whether higher priced items are perceived to be healthier than cheaper alternatives (RQ1). Questions 7, 8, 11, 14 and 15 were used to ascertain whether or not participants’ perceptions of health were affected by health claims on the front of the package (RQ2). Questions 7, 12, 14 and 15 were asked in order to determine whether the physical packaging and design elements of a product affect the overall perception of healthiness (RQ3). RQ4 was answered by question 13 and the inclusion of the granola in the research project. By ranking granola from healthiest to least healthy, the researchers were able to determine whether the granolas FDA-defined as healthy were perceived by participants to be healthy.

 The demographics section of the survey was used to show any common trends between the sexes, age groups or both. This does not correlate directly with the research questions utilized, however, the researchers were interested in the demographics of the sample collected.

 Questions 4-10 utilize a Likert-scale format to acquire an overall impression of the participant attitude towards the subject matter. This general impression was all that was necessary for data collection.

 Questions 11, 12, 14, and 15 are asked using a multiple-choice format because the researchers anticipated the majority of the possible answers. The inclusion of an “other” option covered answers that arose that were unrelated to the research conducted, making the options exhaustive.

  To conduct this survey, the researchers needed 150 printed copies of the paper survey, pens and pencils for participants, a table to hold the granola and for participants to write on, a large bag of Hershey’s kisses, three copies of the recruitment poster utilized (see Appendix C) and a small box for participants to drop their surveys in upon completion. The researchers also needed the following types of granola for survey questions 13-15, along with sheets listing their prices: Quaker Oats’ Oats, Honey, Raisins and Almonds granola ($3.39), Kashi’s Mountain Medley granola ($4.49), Cascadian Farms’ Vanilla Almond granola ($3.99), Udi’s Vanilla Almond granola ($4.99), Hannaford’s store-brand low-fat Cinnamon Raisin granola ($2.99) and KIND’s Honey & Oat granola ($5.99). This survey was conducted on the first floor of the Utica College Ralph F. Strebel Student Center.

 A pre-test was given to employees of Carbone in Utica, N.Y. and students from the State University of New York at Oswego. Those chosen to take the pretest gave critiques to ensure any survey taker understood the meaning of each questions without clarification. There were no major changes made. The test did not contaminate the sample used because all pre-test takers were not members of the population targeted. None of the pre-test takers were Utica College students at any point during the study.

  The motivation for the participants to take the survey was the reward of a Hershey’s kiss provided by the researchers after the participants took the survey.

**Results**

 The survey was taken by 100 participants. The sample was majority female (51%) (See Graph 1: Sample Gender), and roughly half of the participants were between the ages of 18 and 20 (49%) (See Graph 2: Sample Age Range). Participants were further identified through scoring their health habits. Of the participants, 16% were identified as being very concerned with their health, 72% as being somewhat concerned and 12% as being unconcerned.
 To answer RQ1 (Are higher priced items perceived to be healthier than cheaper alternatives?), the researchers posed question 10 on the survey. Results showed that, overall, a higher price does not imply a healthier product. Forty-eight percent of participants disagreed with the statement, “the more expensive a food product is, the healthier it will be,” compared to 27% who agreed to some degree with the statement (See Graph 3: Perceptions Based on Price).
 The second research question (RQ2: Of the following health claims [organic, low fat, non-fat, all natural, low carbohydrate, high fiber, high protein and low sugar], which one gives the consumer the greatest impression that a product will be healthy?) was answered via a checklist-style question on the survey. Results showed that the majority of participants identified that a package reading “all natural” would be the healthiest. Organic and low fat were also popular selections (See Table 1: Health Claims).

RQ3 (Do “earthy” design elements, such as earthy colors, cool tones and nature imagery lead to a higher perception of health?) asked participants to identify what aesthetic features are associated with healthy products. The results showed that the vast majority of those surveyed selected earth tones as a design element commonly associated with health food (See Table 2: Design Elements).
 The final research question (RQ4: How much of the granola that is perceived to be healthy actually meets the FDA guidelines for healthy foods?) required the participants to rank six different brands of granola and identify which was the healthiest based solely on packaging, price (which was provided) and their previous knowledge of the brand/product. The researchers recorded these rankings and each individual granola was then compared to the FDA standards for healthy products (see Methods section). Of the six brands of granola, only one met each FDA standard required in order to be labeled healthy. Hannaford’s store-brand Low-Fat Cinnamon Raisin granola was the only brand to meet the regulations for fat, saturated fat and cholesterol set forth by the FDA. Ten percent of participants identified it as such (See Graph 4: Ranking Results).

Graph 1: Sample Gender

Graph 2: Sample Age Range

Graph 3: Perceptions Based on Price

Table 1: Health Claims

|  |  |
| --- | --- |
| Health Claim | Number of Checks |
| All Natural | 62 |
|  Organic | 55 |
| Low Fat | 53 |
| Low Sugar | 45 |
| High Protein | 43 |
| High Fiber | 41 |
| Non-Fat | 32 |
| Low Carb | 22 |
| Other | 9 |
| None of the above | 3 |

Table 2: Design Elements

|  |  |
| --- | --- |
| Design Element | Number of Checks |
| Earth Tones | 60 |
| Simple | 26 |
| Scenic images | 24 |
| I don’t know | 21 |
| Bright Colors | 14 |
| Other | 7 |
| Animals | 5 |

Graph 4: Frequency That Granolas Were Selected As Most Healthy

**Discussion**

 While this sample was a convenience sample, non-generalizable to the population studied, the researchers made discoveries during the course of this study to supplement previous research. The idea that the term “organic” is perceived as an important factor when consumers choose food was a result that the researchers did not anticipate. Barnes and O’Brien (2012) and Onyango, Hallman and Bellows (2007) both concluded in their research studies that the “organic” trend has been the one most influential food fads of the past decade. The researcher’s study showed that “organic” was the second-highest claim commonly associated with health, second only to “all natural,” which, arguably, is similar to organic. Another interesting finding surrounding the health claims arose when comparing the top-ranked granola brands to the health claims presented on their packaging. The brands that used the claims “organic” and “all natural” on their packaging were ranked markedly higher than the other brands; the top four brands (see Graph 4: Frequency That Granolas Were Selected As Most Healthy) all featured one or more of these claims.

 Kozup, Creyer and Burton (2003) and Nestle (2006) discovered that the majority of consumers would determine the healthiness of a product by the health claims presented on the front of the packaging. The researchers’ data revealed that health claims on the front of packaging was the second-highest rank technique the sample used to come to their conclusions for ranking the granola. This discovery supports the conclusions made by researchers previously.

 Diekman and Malcolm (2009) determined with research that the fat content of a food item was the most important factor for consumers. While this study did not show that the sample was most concerned with fat content as previous research had, “low fat” was in the top three of the most important health claims for the sample.

 The researchers were surprised to see the results for the ranking of granola from the healthiest to the least healthy. According to FDA standards for a “healthy” product, the only granola that met the requirements was the Hannaford store-brand granola. Despite this conclusion, only 10% of the sample believed it was the healthiest compared to the other five brands of granola.

 The correlation between design elements and their effects on healthy product selection was also interesting. KIND, the granola that was ranked as healthiest most frequently (33% of participants placed KIND at number one), does not have the most voted design element: earth tones. Instead, the KIND packaging includes bright colors, which was the fifth-highest ranked design element.

 KIND also was the most expensive granola used in this study ($5.99). When the researchers asked about the relationship between the level of health of a product and how expensive the product is, 49% of the sample disagreed to some extent with the statement, “the more expensive a food product is, the healthier it will be.” KIND granola was still voted healthiest most often, despite its high price tag. Price was given to participants for all granola brands. While KIND is not organic, the health claim “all natural” is present on its cover along with nine other health claims. This suggests that the consumer views the concept of an all-natural product as a better indicator of overall health than price.

 The demographics of this study showed that females perceive themselves as being healthy more often than males. However, the participants who scored highest regarding their own health were not able to correctly identify the healthiest granola. Of the top ten highest scores, no one correctly identified Hannaford’s granola as the healthiest.

**Conclusion** A few obvious limitations exist within this research study. The sample selected for the study was a non-probability convenience sample. For these reasons, the results collected are not generalizable to the population (Utica College students). In general, food is a very subjective topic. A potential limitation of this study was the need to select one area of food to study. If the participant did not like granola, their responses may have been affected by their dislike of the food category and/or ingredients in the product (i.e. a preference towards Vanilla Almond granola versus Cinnamon Raisin granola). There is a possibility that the responses collected were not solely based on the claims and packaging of the products used.

 Opportunities to research nutrient-content claims and food packaging and their effects are numerous. New studies could be created to focus on different types of products or even simply different brands of granola. Specific claims could also be pulled out and studied directly. For example, a study using six different low fat foods that follows the same procedures as this study, specifically the ranking section, could shed light on exactly how much of a role nutrient-content claims play in the consumer’s mind.
 Survey design in this study posed an issue as well. Problems that eluded pretesting but arose during the study involved participants not knowing that the survey had a second page, participants skipping sections and participants not following survey instructions and circling multiple or no answers to questions. Recommendations to correct this issue include condensing the survey to one sheet and studying a population that has more time to answer questions. The majority of the participants in this study were walking to meetings or classes when asked to participate and may have rushed to complete the survey.
 Researchers who wish to conduct a study similar to this one could collect more valuable data by both selecting a different population that would be generalizable to a larger group of individuals, and by collecting a random probability sample. In similar, future studies, it would also be beneficial to use identical flavors from each brand to eliminate bias based on flavor preference. A final recommendation would be to hold the study in a grocery store. This would target the consumers who buy food for their households. These consumers would arguably be more knowledgeable regarding what features are used to determine health value than college students, many of whom have a meal plan and do not purchase their own food regularly.

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**Appendix A:** Survey

We are conducting a research study on how the packaging of products affects the consumer’s perception of how healthy the product is. This survey will require you to describe your own health habits and make assumptions regarding perceived healthiness based on the packaging of 6 different types of granola. This information will be kept private, only available for viewing by the researchers and our research advisor. We are not attempting to sell any of the food products used in this survey and do not promote any of these items. We are interested only in your opinion.

This survey will take a maximum of 10 minutes and participants will receive a piece of candy for their participation. There are no expected risks to participants and you may stop taking the survey at any point. When you have completed your survey, you may deposit it in the provided collection box.

Please answer the questions as completely and honestly as possible.

*Check the answer that applies to you.*

1. Are you willing to participate in this research survey? Please note that this is not mandatory and you may withdraw from this study at any time.

 \_\_\_ Yes \_\_\_ No

**If no, please deposit the survey in the collection box. Thank you for your time.**

**If yes, please continue.**

2. Are you over the age of 18 as of **today**? \_\_\_ Yes \_\_\_ No

**If no, please deposit the survey in the collection box. Thank you for your time.**

**If yes, please continue.**

3. Are you a full or part-time Utica College student? \_\_\_ Yes \_\_\_ No

**If no, please deposit the survey in the collection box. Thank you for your time.**

**If yes, please continue.**

Answer the following questions by circling either strongly agree (SA), agree (A), neutral (N), disagree (D), or strongly disagree (SD).

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SA | A | N | D | SD |

4. I consider myself a healthy person.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SA | A | N | D | SD |

5. I eat a healthy diet.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SA | A | N | D | SD |

6. The nutrition level of food is important to me.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SA | A | N | D | SD |

7. I use food packaging to determine whether or not to buy certain food products.

8. I read the nutrition information label before

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SA | A | N | D | SD |

 consuming food products.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SA | A | N | D | SD |

9. Taste is the most important consideration when purchasing a product.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| SA | A | N | D | SD |

10. The more expensive a food product is, the healthier it will be.

*Check all that apply.*

11. Of the 8 health claims listed below, please check the box in front of the claims that would give you the impression that the product is healthy. You may check more than one box.

If you personally look for another claim on packaging, please fill it in under the “other” option.

 Organic Low fat Non-fat All natural Low carbohydrate High fiber

 High protein Low sugar Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_
 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

None of the above

12. What design techniques do you associate with the packaging of healthy food?

* Simple Design  Earth tones (brown, green)  Bright colors
* Scenic images  Images of animals  I don’t know
* Other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Please review the 6 different brands of granola in front of you for as long as you need to.*

13. Rank the granola from one being the healthiest to six being the least healthy, in your opinion:

 1.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 2.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 3.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 6. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Circle the answer that is the most applicable to you.*

14. What helped you come to your conclusion about the healthiest granola?

 A. Health claims on the front

 B. Previous knowledge of the brand

 C. Nutrition facts on the label

 D. Packaging design/images

 E. Previous experience with the brand

 F. Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

15. What helped you come to your conclusion about the least healthy granola?

 A. Health claims on the front

 B. Previous knowledge of the brand

 C. Nutrition facts on the label

 D. Packaging design/images

 E. Previous experience with the brand

 F. Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Demographics**

*Check the answer that best applies to you.*

16. \_\_\_Male \_\_\_Female \_\_ N/A

17. Age: \_\_\_ 18-20 \_\_\_21-23 \_\_\_24-26 \_\_\_ 27 or older

Please place your survey in the drop box when you are finished.

Thank you for your time. If you have any questions regarding this survey or our research, please feel free to contact either of us at the emails listed below.

**Vikki Feggulis**: vkfeggul@utica.edu

**Alexis March:** aemarch@utica.edu

**Appendix B:** Tables and Charts

**Table 1**
Qualifications for Using the Term “Healthy”

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **If the food is...** | **The fat level must be...** | **The saturated fat level must be...** | **The cholesterol level must be...** | **The food must contain...** |
| (A) A raw fruit or vegetable | Low fat as defined in §101.62(b)(2) | Low saturated fat as defined in §101.62(c)(2) | The disclosure level for cholesterol specified in §101.13(h) or less | N/A |
| (B) A single-ingredient or a mixture of frozen or canned fruits and vegetables1 | Low fat as defined in §101.62(b)(2) | Low saturated fat as defined in §101.62(c)(2) | The disclosure level for cholesterol specified in §101.13(h) or less | N/A |
| (C) An enriched cereal-grain product that conforms to a standard of identity in part 136, 137 or 139 of this chapter | Low fat as defined in §101.62(b)(2) | Low saturated fat as defined in §101.62(c)(2) | The disclosure level for cholesterol specified in §101.13(h) or less | N/A |
| (D) A raw, single-ingredient seafood or game meat | Less than 5 grams (g) total fat per RA2and per 100 g | Less than 2 g saturated fat per RA and per 100 g | Less than 95 mg cholesterol per RA and per 100 g | At least 10 percent of the RDI3or the DRV4per RA of one or more of vitamin A, vitamin C, calcium, iron, protein, or fiber |
| (E) A meal product as defined in §101.13(l) or a main dish product as defined in §101.13(m) | Low fat as defined in §101.62(b)(3) | Low saturated fat as defined in §101.62(c)(3) | 90 mg or less cholesterol per LS5 | At least 10 percent of the RDI or DRV per LS of two nutrients (for a main dish product) or of three nutrients (for a meal product) of: vitamin A, vitamin C, calcium, iron, protein, or fiber |
| (F) A food not specifically listed in this table | Low fat as defined in §101.62(b)(2) | Low saturated fat as defined in §101.62(c)(2) | The level for cholesterol specified in §101.13(h) or less | At least 10 percent of the DRV per RA of one or more of vitamin A, vitamin C, calcium, iron, protein or fiber |

|  |
| --- |
| **Table 2**Content Claims("Free," "Low," "Reduced/Less") |
| **Free** | **Low** | **Reduced/Less** | **Comments** |
| Synonyms for "Free": "Zero", "No", "Without", "Trivial Source of", "Negligible Source of", "Dietarily Insignificant Source of"Definitions for "Free" for meals and main dishes are the stated values per labeled serving | Synonyms for "Low": "Little", ("Few" for Calories), "Contains a Small Amount of", "Low Source of" | Synonyms for "Reduced/Less": "Lower" ("Fewer" for Calories)"Modified" may be used in statement of identityDefinitions for meals and main dishes are same as for individual foods on a per 100 g basis | For "Free", "Very Low", or "Low", must indicate if food meets a definition without benefit of special processing, alteration, formulation or reformulation; e.g., "broccoli, a fat-free food" or "celery, a low calorie food" |

|  |
| --- |
| **Table 3**Definitions of Nutrient Content Claims |
| **Nutrient** | **Free** | **Low** | **Reduced/Less** | **Comments** |
| **Total Fat**21 CFR 101.62(b) | Less than 0.5 g per RACC and per labeled serving (or for meals and main dishes, less than 0.5 g per labeled serving) (b)(1)Contains no ingredient that is fat or understood to contain fat, except noted below ([\*](http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/FoodLabelingNutrition/FoodLabelingGuide/ssLINK/ucm064911.htm#ftnt)). | 3 g or less per RACC (and per 50 g if RACC is small) (b)(2)Meals and main dishes: 3 g or less per 100 g and not more than 30% of calories from fat (b)(3) | At least 25% less fat per RACC than an appropriate reference food (or for meals and main dishes, at least 25% less fat per 100g) (b)(4)& (5)Reference food may not be "Low Fat" | "\_\_% Fat Free": may be used if food meets the requirements for "Low Fat" 21 CFR 101.62(b)(6)100% Fat Free: food must be "Fat Free" (b)(6)(iii)"Light"--see previous Calorie commentsFor dietary supplements: total fat claims cannot be made for products that are 40 calories or less per serving 21 CFR 101.62(a)(4) |
| **Saturated Fat**21 CFR 101.62(c) | Less than 0.5 g saturated fat and less than 0.5 g trans fatty acids per RACC and per labeled serving (or for meals and main dishes, less than 0.5 g saturated fat and less than 0.5 g trans fatty acids per labeled serving) (c)(1)Contains no ingredient that is understood to contain saturated fat except as noted below ([\*](http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/FoodLabelingNutrition/FoodLabelingGuide/ssLINK/ucm064911.htm#ftnt)) | 1 g or less per RACC and 15% or less of calories from saturated fat (c)(2)Meals and main dishes: 1 g or less per 100 g and less than 10% of calories from saturated fat (c)(3) | At least 25% less saturated fat per RACC than an appropriate reference food (or for meals and main dishes, at least 25% less saturated fat per 100g) (c)(4)& (5)Reference food may not be "Low Saturated Fat" | Next to all saturated fat claims, must declare the amount of cholesterol if 2 mg or more per RACC; and the amount of total fat if more than 3 g per RACC (or 0.5 g or more of total fat per RACC for "Saturated Fat Free") ( or for meals and main dishes, per labeled serving) 21 CFR 101.62(c)For dietary supplements: saturated fat claims cannot be made for products that are 40 calories or less per serving 21 CFR 101.62(a)(4) |
| **Cholesterol**21 CFR 101.62(d) | Less than 2 mg per RACC and per labeled serving (or for meals and main dishes, less than 2 mg per labeled serving)Contains no ingredient that contains cholesterol except as noted below ([\*](http://www.fda.gov/Food/GuidanceComplianceRegulatoryInformation/GuidanceDocuments/FoodLabelingNutrition/FoodLabelingGuide/ssLINK/ucm064911.htm#ftnt)) (d)(1) | 20 mg or less per RACC (and per 50 g of food if RACC is small) (d)(2)Meals and main dishes: 20 mg or less per 100 g(d)(3) | At least 25% less cholesterol per RACC than an appropriate reference food (or for meals and main dishes, at least 25% less cholesterol per 100g) (d)(4)& (5)Reference food may not be "Low Cholesterol" | Cholesterol claims only allowed when food contains 2 g or less saturated fat per RACC; or for meals and main dish products, per labeled serving size for "Free" claims or per 100 g for "Low" and "Reduced/Less" claimsMust declare the amount of total fat next to cholesterol claim when fat exceeds 13 g per RACC and labeled serving (or per 50 g of food if RACC is small), or when the fat exceeds 19.5 g per labeled serving for main dishes or 26 g for meal productsFor dietary supplements: cholesterol claims cannot be made for products that are 40 calories or less per serving |
|  |  |  |  |  |

**Appendix C:** Recruitment Materials

