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End Use Packaging: A Survey of Customer Perception of Recycling and Environmental Impact of Packaging Materials

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ABSTRACT

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Studies have shown that traditional food packaging for the fast food industry leach toxic chemicals into the food products. Some of these toxins are known endocrine disruptors, which results in reproductive issues as well as hormone imbalances. Alternatives to traditional food packaging have been addressed with special attention to bioactive, biopolymers, and biodegradable packaging in addition to active and intelligent packaging. The hypothesis states that customers will have high demand for more environmentally sustainable fast food packaging, while the alternative hypothesis states that demand will not be high enough to financially support the costly introduction of more environmental packaging products. The data attained suggest that the hypothesis will not be rejected. However, there are not conclusive results in terms of the alternative hypothesis, as further studies that address economical concerns must be completed. In terms of consumer demand, 94.92% preferred environmentally sustainable packaging over traditional packaging materials.

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CHAPTER 1

INTRODUCTION

Research Question

Is there customer demand for more environmentally sustainable fast food packaging that consists of materials that do not harm the environment and assist in sustaining such, and if so, how could such demand impact a company's triple bottom line regarding societal, environmental, and economical aspects? Additionally, would education pertaining to the health risks, as well as environmental detriment, aid in altering perceptions toward adoption of sustainable materials?

Limitations of the Study

In order to determine the consumer demand for environmentally sustainable packaging materials, a two-part survey was conducted primarily through means of the social networking website Facebook. However, conducting research through Facebook, even when a broad range of age groups, genders, and income brackets are involved, is bound to restrict participation. As such, a greater number of young females participated, more so than other demographics. Additionally, due to the avenue of research, certain age limitations were noted, which resulted in smaller sample sizes as the age of participants increased. Still, the research was divided among age groups, genders, and income brackets in order to collect more accurately representative data. Over 2,000 individuals were invited to participate in the two-part survey, but only 118 people completed the surveys. Consequently, this proved to be a limitation in the study. In order for an even more accurate representation of the population, a larger sample size would need to be

attained. Otherwise, the data are seemingly skewed. With that said, further research must be done before any conclusions can be reached. In addition, participants would need to be further surveyed to determine if environmentally sustainable preference would remain the same despite a possible increase in cost of product. No conclusions can be drawn to support or reject the alternative hypothesis.

Packaging Materials in Relation to the Fast Food Industry

In today's fast food industry, a variety of packaging materials are used that may cause significant health risks to consumers. Such materials include polymers, polyethylene, and polystyrene to name a few (Muncke, 2009). The American Heritage College Dictionary (Pickett, 2004) defines a polymer as, "Any of numerous natural or synthetic compounds of usu. high molecular weight consisting of repeated linked units, each a relatively light and simple molecule" (p. 1,080). Also defined is polyethylene: "A polymerized ethylene resin, used especially for containers, kitchenware, and tubing or in the form of films and sheets for packaging" (Pickett, 2004, p. 1,079). Lastly, polystyrene is defined as, "A rigid clear thermoplastic polymer that can be molded into objects or made into a foam used in insulation and packaging" (Pickett, 2004, p. 1,081).

In regards to the fast food industry's uses of various packaging, whether plastic polymers that hold beverages, polystyrene cups used to insulate milkshakes, or coated paper products used to package and deliver hamburgers to consumers, the said packaging ingredients may lead to serious health problems after years of exposure and chemical accumulation in the body (Muncke, 2009).

In response to this growing epidemic of subtle yet toxic exposure, studies have been conducted mostly around the topic of endocrine disruptors that cause a plethora of ailments. While many studies explain the dangers of using certain materials for packaging, other studies have been done that offer resolution to the issue with alternative packaging options. While the initial concern is the packaging in which the food is delivered to consumers, another apprehension is regarding the packaging in which the ingredients and food are shipped to the fast food companies. Subsequently, fast food packaging is not limited to the materials used for final delivery of the product.

While studies show the harmful effects of packaging materials used for food, other studies propose biodegradable options or active and intelligent food packaging. While some claim the products are safe and well regulated, others support the contrary notion that the materials remain unhealthy for consumers.

Hypothesis

In terms of customer demand, the hypothesis H_0 states that consumers of the fast food industry will prefer more environmental packaging for their food.

Alternative Hypothesis

The alternative hypothesis H_1 states that there will not be high customer demand for more environmental food packaging in the fast food industry to support a costly change of packaging materials.

CHAPTER 2

LITERATURE REVIEW

Potential Health Risks of Traditional Packaging

Endocrine Disruptors

As a result of product leaching, packaged food is exposed to chemical compound ingredients from its packaging, a process known as migrating. Causes of such include the following: heating, exposure to UV light, and increased storage time. Regarding plastic products, the starting substances used for the preliminary polymerization step, such as monomers or catalysts as well as additives from the manufacturing process, are all possible leaching contaminants. In terms of paper food packaging perfluorinated compounds are released through migration (Muncke, 2009).

According to Muncke (2009), in regards to known endocrine disruptors:

> A fierce public debate has unfolded during the past five years over the potential safety of bisphenol A (BPA), a plastic monomer that is one of the highest production-volume chemicals worldwide. BPA is extensively used in many different types of food packaging and a known endocrine disruptor. In fact, many intentionally-used substances in food packaging have been identified as endocrine disruptors in biological systems. Therefore, it is important to consider food packaging as an important route of endocrine disrupting compounds (EDCs) exposure to humans by leaching form the packaging into the food and the environment by waste disposal. (p. 4,550)

Figure 1, derived from Muncke (2009), maps the origination of various migrants. Examples include the following: nonintentionally added substances (NIAS), starting substances,

and additives from the manufacturing process such as plasticizers, heat stabilizers, dyes, fillers, and pigments. The aforementioned migrants are comprised of chemical compounds that are harmful for human exposure. While studies are not conclusive concerning whether or not exposure to EDCs leads to disease advancement, studies have shown that animals display adverse effects from exposure to hormonally active chemicals, and some EDCs have been known to disturb epigenetic imprinting in animals, contributing to disease susceptibility in present and subsequent generations (Muncke, 2009).

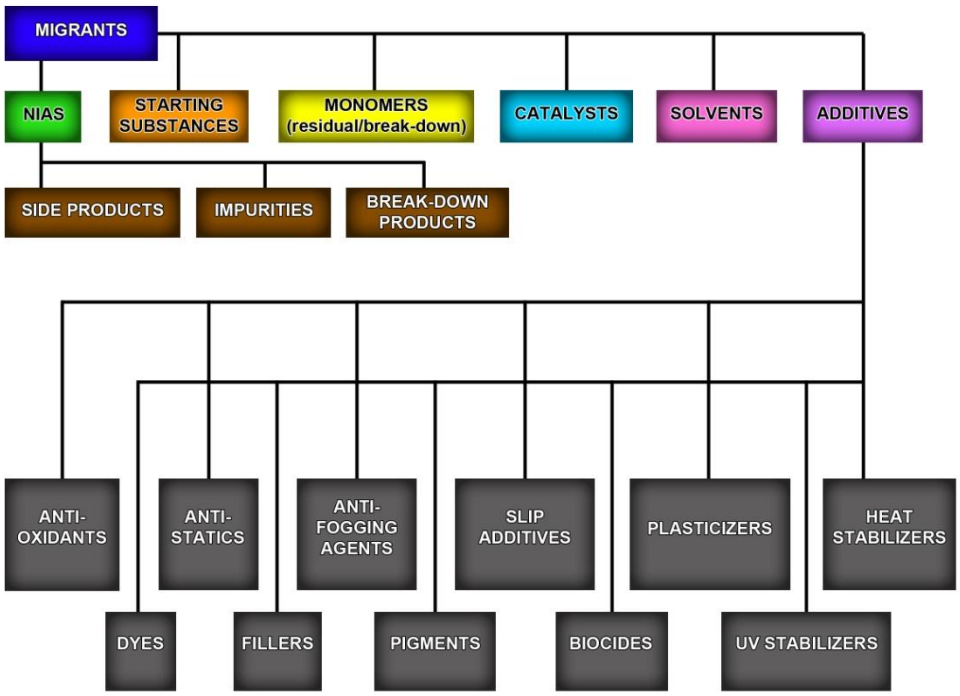

Figure 1. Migrant Origination Map, (adapted from Muncke, 2009).

The endocrine system functions by receiving chemical messages from hormones, which regulate reproduction, metabolism, growth and development, natural stress defenses, in addition to water, electrolyte, and nutritional balance of the blood. While there are not many irrefutable studies regarding what a safe dose of endocrine disruptors would be, there is enough evidence to

raise awareness and concern by a plethora of governmental and scientific agencies (LaFleur & Schug, 2011).

The United States Environmental Protection Agency (US EPA) has proposed acceptable levels of endocrine disruptors, but an agreeable dose has yet to be determined among the science community. In addition to the US EPA, the European Union (EU) has also been involved with determining safe levels of exposure to various leachates, chemicals, or components from packaging that can migrate from or through the material into the product. In recent years it was discovered that polyvinyl chloride (PVC) leached from products including toys and infant teething products. In 2005 the EU chose to ban the use of certain phthalates in such products. In 2009 it was banned entirely from its uses in medical devices. Currently studies are being done regarding synthetic materials and additives such as polycarbonate, polyethylterephthalate (PET), and bisphenol A (BPA) in order to determine its safety in terms of consumers. Findings have determined that potential endocrine disruptors were, in fact, leaching from said materials (LaFleur & Schug, 2011).

Phthalates are widely used as plastic emollients and additives in a variety of products including food packaging. The chemicals do not accumulate in the body but are rather metabolized and essentially excreted in urine. Despite this, issues are raised with continual exposure over time. One negative health impact is the effect of phthalates on the thyroid. There are not many studies to date that have been completed, but in animal testing studies have shown morphological disruptions in the thyroid after exposure. With that said, even though there is evidence that shows a link between phthalate exposure and thyroid disruption, there is not enough current knowledge to form definite conclusions (Boas, Feldt-Rasmussen, & Main, 2011).

Much like the thyroid effects of exposure to Phthalates, BPA exposure is inconclusive regarding its damage to the thyroid. However, there is reason to believe that concern for such is not invalid. According to Boas et al. (2011) BPA could potentially affect thyroid metabolism, negatively impacting consumers' health. It has also been mentioned that health concerns could be greater for the fetus and infants because they may potentially be more vulnerable to BPA exposure. While studies are not conclusive, there is enough reasonable concern to conduct further studies and investigations regarding additional health impacts of exposure.

As previously stated, BPA is a chemical in polycarbonate plastics that can migrate into the substance the container is holding. According to Kang, Katayama, and Kondo (2006a), in terms of the BPA migration process, the following was determined:

> The high levels of BPA migration from used polycarbonate containers compared to those from new similar articles relates to the degradation of the polymer. The carbonate linkages are rather stable, but can hydrolyze in hot water or at an alkaline pH. This means that BPA can migrate from plastics after washing and sterilization in alkaline solutions or in hot water (e.g. steam). The more polycarbonate containers are used, the higher the possibility of BPA migration from them.
>
> Moreover, BPA migration from plastics may be higher in food-simulating liquids than in water. In studies of BPA migration from polycarbonate plastics conducted with the use of food-simulating liquids, BPA levels in ethanol and acetic acid differed with storage time and temperature but were higher than that in water. (p. 84)

BPA is a known endocrine disruptor, and it has been proven that exposure is widespread. Urine samples were taken from 394 adults with different ages, places of residence, and gender, with a detection of BPA in 95% of the tests. While environmental exposure is a high risk, food

is considered the primary means of contamination. At varying doses, the following endocrine systems are susceptible to disruption: decreased daily sperm production and fertility in males, stimulation of mammary gland development, decrease in antioxidant enzymes and persistent alterations in peripubertal mammary gland development, and fetal disruption. As a result reproduction is negatively impacted, and stimulated mammary gland development could result in breast cancer. The level of damage is yet to be fully determined, but studies are leading to the conclusion that BPA exposure will result in a myriad of serious health impacts (Kang et al., 2006a).

Environmental Impacts of Traditional Packaging

Polystyrene

In terms of the shipment of food, such as the case with fast food products, polystyrene is often used due to its insulating properties. However, other packaging materials have been researched as a result of the negative impacts to the environment from the use of polystyrene products. In a recent study of the export of fresh fish products, the British market often uses well insulated expanded polystyrene (EPS) boxes, but due to environmental and economic reasons, they have also looked into using corrugated plastic (CP) boxes. EPS containers are comprised of polystyrene beads and consist of up to 98% of air pores, while CP boxes are constructed of extruded corrugated plastic, which are polypropylene sheets. They are thinner than EPS boxes, but they have been determined to lack strength and do not insulate as well as polystyrene containers (Arason, Gospavic, Margeirsson, Palsson, & Popov, 2011).

The study of the transport of fish for the British market concluded that if CP boxes were used for shipment purposes, including frozen ice packs, they would reduce the risk of

temperature abuse to the fish fillets. Regardless of temperature controlling efforts, polystyrene remains the better insulator for food transport. Despite its negative impacts environmentally, it serves its purpose well for insulating packaged products (Arason et al., 2010).

Polystyrene poses a threat to the environment postuse. In terms of direct reprocessing, or primary recycling, it can only be done to a certain degree. Combustion, which is secondary recycling, is not a desired because it causes harmful gases to be produced. Landfilling polystyrene materials is detrimental to the environment, with toxic chemicals that make up the material leaching into the soil as they decompose. If said chemicals leach into the soil, the groundwater could be contaminated. While water treatment facilities do filter incoming water, some chemicals are missed. As the result of a detrimental cycle, an initial environmental danger can later become a health threat to consumers (Puente & Sedran, 1998).

An alternative to the harmful polystyrene practices of postuse is tertiary recycling, which converts the polymers into useful fuels. Through the use of acidic catalysts, polystyrene can be converted specifically into fuel sources that are mainly in the range of gasoline. This process is completed when it is reacted at 550 degrees Celsius, which is 1,022 degrees Fahrenheit, through means of fluid catalytic cracking (FCC). FCC is the process used in petroleum refineries to produce valuable gasoline. While polystyrene is environmentally unsafe postuse, it can be used as a necessary fuel source in place of extracting more fossil fuels. Before this would be marketable, minor technological adjustments need to be made, but it serves as a possible alternative to the detrimental and typical disposal of polystyrene (Puente & Sedran, 1998).

Bisphenol A

Not only are endocrine disrupting compounds (EDC) leaching into food and water through packaging, they are also contaminating the environment. Much like the chemicals that leach into the groundwater from polystyrene decomposition, BPA also can leach into the environment. Concerns regarding EDCs have initiated efforts to remove BPA from a plethora of contaminated sources such as water, wastewater, wastewater sludge, sediments, and soils (Brar, Mohapatra, Surampalli, & Tyagi, 2010).

In explanation of the process of waste water treatment plants (WWTPs), Brar et al. (2010) describes the following:

> Sewage entering the WWTPs is increasing in complexity day by day due to the addition of new contaminants, which form principal load of the influents. BPA can end up in the municipal and industrial wastewater treatment system, either through direct discharge into sewers or via stormwater run-off. Furthermore, pre-treatment of WW and WWS is adopted to destroy the organic compounds and improve the solubilization of sludge. Various methods employed for sludge pre-treatment include mechanical treatment, chemical treatment, thermo-alkaline treatment, oxidative treatment, and radiation treatment. Basically, the choice of either one of these methods depends on the cost of the process and other factors, such as concentrations and volume of the effluent to be treated. Although conventional biological treatments have been reported to be able to reduce some EDCs in WW, a large portion of the EDCs are in fact removed by absorption, and their sorption on the sludge causes further concerns for sludge management. (p. 924)

Brar et al. (2010) further explain that recently, WWS has been transformed into value-added products (VAPs) through bioconversion. In order for this to be done, WW and WWS

must be free of BPA. Therefore, pretreatment methods must be altered in order to adhere to the necessary guidelines and requirements for successful bioconversion.

In addition to leaching BPA into soil and wastewater sources, BPA is also introduced to the environment through microorganisms and mammals. High levels of BPA were found to exist in waste landfill leachates, with polyvinyl chloride (PVC) products that use BPA as a stabilizer during manufacturing as the main source. Once it is biodegraded by microorganisms, it is dispersed into the environment. Enzymes in plants and animals can metabolize BPA as well (Kang, Katayama, & Kondo, 2006b).

According to Kang et al. (2006b), "…the metabolites of BPA can enhance estrogenicity or toxicity, generally, BPA metabolism by organisms leads to detoxication of BPA" (p. 87). Regardless, BPA still poses a threat to the environment. Even though BPA can be biodegraded or metabolized, it does not eliminate the estrogenic or toxic effects on organisms within an environment (Kang et al., 2006b).

Alternative Food Packaging

Bioactive, Biopolymer, and Biodegradable Food Packaging

Functional foods are foods that in addition to their nutritional effects are enhanced by outside elements that contribute to a healthier well-being and reduction of the risk of disease. Bioactive packaging does just that. Such packaging acts as a controlled release of bioactive components or nanocomponents, which promotes a healthier state. The functional concept includes the following: prebiotics, probiotics, phytochemicals, marine oils, lactose-free foods, encapsulated vitamins, bioavailable flavonoids, among various other healthy contributions. As is further discussed in the next section, the main difference between active and intelligent

packaging and bioactive packaging is that while the former mainly deals with sustaining and increasing quality and safety of packaged foods, the latter directly impacts the health of the consumers by the materials used for packaging (Gavara, Lopez-Rubio, & Lagaron, 2006).

In terms of more specific, functional substances that are thought most appropriate for incorporation in the packaging are the following: phytochemicals, vitamins, nanofibers, and prebiotics. Phytochemicals contain disease-preventing compounds that have been associated with the prevention and/or treatment of cancer, diabetes, cardiovascular disease, and hypertension. Phytochemical's functions include helping to prevent cell damage and cancer cell replication as well as decreasing cholesterol levels. Vitamins contribute to a healthier diet and would serve to promote a well-balanced food product. Nanofibers have health maintenance and disease preventive benefits, while prebiotics promote the growth of beneficial bacteria in the colon for healthier digestion (Gavara et al., 2006).

In regards to biopolymer packaging materials, it is becoming increasingly necessary because global consumption of plastics has exceeded 200 million tons, with an annual growth rate of 5%. Plastics are derived from nonrenewable sources such as crude oil. Being petroleum-based, types of plastics include the following: polyethylene terephthalate (PET), polyvinyl chloride (PVC), polyethylene (PE), polypropylene (PP), polystyrene (PS), and polyamide (PA). While recycling is beneficial in the sense that it reduces landfill wastes, the recycling process can be economically difficult, and with materials being contaminated by biological substances recycling can be unfeasible, as well. The alternative, as previously stated, is biopolymer packaging, which is able to naturally compost without detriment to the environment and act as fertilizers and soil conditioners (Rocculi, Romani, Rosa, & Siracusa, 2008).

The uses of biopolymers include service packaging such as cups, plates, and cutlery. However, the cost for production is very high. Despite cost, though, biopolymers serve to replace plastic materials that erode the supply of natural resources. While the more environmentally sound choice fulfills ecological needs, it does possess performance limitations such as thermal resistance and mechanical properties (Rocculi et al., 2008).

Biologically based packaging is tested in a variety of conditions in order to judge its ability to degrade. In order to measure quantitative results, the standard tests include settings such as a landfill, compost, soil, or an aquatic environment. In order to degrade the packaging material must involve the following: biodegradability, disintegration during biological treatment, effect on the biological treatment process, and effect of the quality of the resulting compost (Bertelsen et al., 1999).

While biologically based packaging is more environmentally sustainable than traditional plastic materials, little testing has been done to research the actual effects of biopolymers on food when contact is made. Studies have, however, indicated that biobased packaging materials are still very much in its early stages of development (Bertelsen et al., 1999).

Biopolymers have been limited, as previously stated, due to their poor mechanical and barrier properties. However, the use of fillers that act as reinforcing compounds will help to strengthen the polymers. In order to make it strong, though, at least one nanoscale dimension must be used, which produces nanocomposites. Such nanoparticles are ideal for food packaging, as they also produce antimicrobial activity, enzyme immobilization, and biosensing when combined with a polymer. Essentially, nanoparticles make biopolymers a more feasible and viable option for food packaging (Azeredo, 2009).

There is limited knowledge and scientific data regarding migration of nanoparticles from the packaging material to the food source. The toxicological impacts on consumers from such migrants are not widely known. Further testing must be performed prior to expansive use as a primary alternative to traditional plastic packaging (Azeredo, 2009).

It is evident through various studies that the latest trends and innovations in packaging design involve the use of biodegradable materials. According to Mahalik and Nambiar (2010), "The global market for biodegradable polymers exceeds 114 million pounds and is expected to rise at an average annual growth rate of 12.6% to 206 million pounds in 2010" (p. 118).

The following are known to be acceptable bioplastics: cellulose, starch, poly-beta-hydroxyalkanoates (PHB), and polylactide acid (PLA) plastics. Cellulose is fusible and soluble in hydrogen bond-breaking solvents, which results in it becoming more processable due to its derivatives. Enzymatic attack at the glycosidic linkages between the sugar groups results in biodegradation of starch-based polymers. PHB is broken down and degraded by the secretion of enzymes from various microorganisms. In addition, PHB has 100% resistance to water, 100% biodegradability, and thermoplastic process ability. Lastly, PLA, which is a thermoplastic, is one of the more ideal options regarding packaging due to its increased biodegradability, process ability, and biocompatibility (Mahalik & Nambiar, 2010).

Active and Intelligent Food Packaging

According to Beest, Debevere, de Kruijf, Devlieghere, and Vermeiren (1999), "Active packaging is an innovative concept that can be defined as a type of packaging that changes the condition of the packaging to extend shelf-life or improve safety or sensory properties while maintaining the quality of the food" (p. 77)

Active packaging also has antimicrobial characteristics that control unnecessary amounts of micro-organisms on foods. This involves the release of antimicrobial entities that with some could result in a safety risk if not tightly controlled within the packaging material. In addition to antimicrobial aspects, antioxidants are known to prolong shelf life mainly for dried products. Being incorporated into plastic films for polymer stabilization purposes, the material is protected from degradation. However, increased storage time will cause the antioxidant concentrations to oxidize due to diffusion through the polymer toward its lining, succeeded by evaporation (Beest et al., 1999).

Active and intelligent packaging contains oxygen scavenger technologies that improve barrier packaging and reduce oxygen contamination that affects the shelf-life of food. The technology works by absorbing the oxygen, not allowing it to permeate the packaging surface. In addition to oxygen control, oxygen scavenger technologies also help reduce moisture content in food, sustaining freshness for longer than traditional packaging methods (Markarian, 2004).

CSP Technologies has patented ACTIV-PAK engineered polymeric materials that have been designed with precise absorption or release rates regarding moisture, gases, volatile odors, and flavors. The process is done through a microscopic channeling agent that is designed to absorb or emit unnecessary molecules such as moisture, carbon dioxide, and oxygen. Such innovation insures freshness and shelf-life of many food products (Markarian, 2004).

In addition to previous definitions, Skovgaard (2008) notes, "…Active packaging connotes a package the 'responds' to a suboptimal physiological or environmental condition in the package and improves it." He adds, "Intelligent packaging, on the other hand, involves packaging sensing conditions in a package and communicating this information to a human or appliance" (p. 362).

Essentially, intelligent packaging acts as a detection of food-borne pathogens, while active packaging prevents or reduces the growth of such pathogens. A unique and groundbreaking alternative to packaging has been developed by combining these two forms of packaging. Consumers are provided with food products that remain fresh longer, and concerns of food-borne pathogens begin to diminish (Skovgaard, 2008).

Business Communication Company Inc. (2004) stated that the U.S. market for active, controlled, and intelligent packaging for foods and beverages had exceeded $38 billion in 2004, with an expected average annual growth rate of 9.7% between 2003 and 2008. The rest of the world has been ahead of the United States in terms of active, controlled, and intelligent packaging, with a forecasted average annual growth rate of 11.3% through 2008.

The leaders in the market included oxygen scavengers, moisture controllers, and ethylene absorbers to aid in reducing pathogens and gases that result in food spoilage. Intelligent packaging consists of time and temperature indicators, embedded microchips and transparent polymers, and radio frequencies that are led by scan-code and electronic article surveillance (EAS) technologies (Business Communication Company Inc., 2004).

In addition to acting as fillers in biopolymers, nanoparticles are also essential for food preservation purposes regarded with active packaging. It has been discovered that heavy metals are effective antimicrobials that include salts, oxides, and colloids. Acting in the form of oxygen scavenging, ethylene oxidation aids in the extended shelf-life of food products. Copper has served as an excellent humidity sensor, while titanium oxide aids in UV-blocking performance. A concern of many, though, is whether or not the heavy metals will migrate from the packaging to the foods within the packaging, posing a potential health risk to consumers (Fernandez, Llorens, Lloret, Picouet, & Trbojevich, 2011).

According to Fernandez et al. (2011), "Recent works have proven that metal nanoparticles act as a stable nanoreservoir of metal ions, which could also provide diverse properties, such as antimicrobial or oxygen scavenging activity." They add, "The development of novel metallic-based micro and nanocomposites containing metal loaded inorganic materials or metal nanoparticles is, therefore, providing advanced properties for tailored applications which are being explored also in food contact and active food packaging" (p. 8-9). They go on to say that regulations need to be considered regarding the possible health risks related to the potential migration of heavy metals into foods and drinks (Fernandez et al., 2011).

The ingredients of active and intelligent packaging, as previously mentioned, are in question regarding legislation and regulation of materials. However, as of 2008 there was not a specific directive or regulation that pertained exclusively to such packaging. Nevertheless, the packaging products must comply with the Framework Regulation (EC) 1935/2004, particularly Articles Three and Four. Article Three is in regards to regulation that states that food contact materials cannot transfer elements to food that endanger consumer health, alters the composition in an unacceptable manner, or incurs deterioration in organoleptic characteristics (Beuken et al., 2008).

Article Four of the Framework Regulation addresses the main issues concerning active and intelligent packaging. The issues and requirements are as follows: active materials may change the composition of foods; substances released from active packaging must be authorized; active materials should not alter organoleptic characteristics of food; intelligent materials cannot be construed as misleading; adequate labeling is required for identification of nonedible parts; and adequate labeling must be applied to indicate that the materials are active and/or intelligent (Beuken et al., 2008).

In comparing U.S. regulations regarding food consumption and potential toxicological contaminants with those of Europe, the United States does not require toxicology data reports when the source is minimal dietary exposure, while Europe requires toxicological data on all substances without regard to doses (Cirillo et al., 2010).

Framework Regulation (EC) 450/2009 is newly integrated, with updates specifically regarding active and intelligent packaging. Also in line with the European Food Safety Authority (EFSA), three areas of risk are assessed: "Migration of active or intelligent substances; migration of their degradation and/or reaction products; and their toxicological properties" (p. 1,432). Additionally, proper labeling will be required that identifies the information of the intelligent packaging to be correct and that the active packaging has the projected effect on the food, so as not to mislead consumers. Due to the new regulations, active and intelligent packaging would appear to follow the general requirements regarding safety and marketing issues (Cirillo et al., 2010).

Reasons for Disagreement in Studies

Biodegradable packaging options and active and intelligent packaging have caused concerns regarding chemical migrating into food products. However, in adherence with regulations, active and intelligent packaging has been approved as containing acceptable doses of migrants. Further testing is needed for biodegradable alternatives because the effects of its chemical leaching have yet to be conclusively determined.

CHAPTER 3

LITERATURE REVIEW CONCLUSION

In closing, traditional food packaging that is used in the fast food industry for both shipment and end use delivery has been proven to release endocrine-disrupting chemicals into the food products. Therefore, alternative food packaging must be addressed in order to promote healthier end products for consumers. Bioactive packaging enhances the food products by controlled release of phytochemicals, vitamins, nanofibers, and prebiotics. Biopolymer and biodegradable options are able to decompose postuse, but they do pose a potential threat by leaching a low dose of chemicals into the food products.

Active and intelligent packaging is designed to reduce moisture and food-borne pathogens, resulting in a longer shelf-life. The intelligent portion of the packaging contains sensors that indicate the freshness of the product. While chemical migrating is an issue, it has been determined through research that the doses are of acceptable levels. Therefore, active and intelligent food packaging is, in fact, the more viable and feasible option in terms of alternative packaging. While both biodegradable options and active and intelligent packaging are more environmentally sustainable, the cost and verified reduced health risks of the latter are more marketable in the long run. In conclusion, traditional food packaging should be replaced with active and intelligent packaging because it possesses health, environmental, and economic benefits.

CHAPTER 4

MATERIALS AND METHODS

Based on the research gathered regarding the environmental impacts and health risks of traditional fast food packaging materials, a two-part survey was conducted to determine customer demand for more environmentally sustainable packaging. The surveys were distributed through an event page on Facebook, a social networking website, as well as through email for those who wanted to participate but did not have a Facebook account. The two part survey was constructed in Microsoft Excel, in addition to a Microsoft Word document format for participants who did not have access to Excel. Survey 1 displays Part I of the two part survey (Appendix B, 43). Survey 2 displays Part II of the two-part survey (Appendix B, 44).

The purpose of the two-part survey was to first determine if there was initial customer demand for more environmentally sustainable packaging, and then to determine if education regarding health risks and environmental impacts would change the initial responses. In doing so, predetermined bias was eliminated because the first survey only served the purpose of asking the questions in a straightforward manner without secondary information. The education portion of the second part of the survey was derived from research gathered on the subject of environmental impacts and health risks of using traditional packaging materials.

As previously stated, the two-part survey was distributed through means of Facebook, where over 2,000 individuals were invited to participate. First, an event page was created, and then the first groups of people were invited. After which a Facebook message was sent to invitees notifying them of the two-part survey and requesting that the invitees invite others to participate, as well. Over 700 people were initially invited, which later grew to over 2,000

people invited. In doing so a broad range of individuals were invited to the survey event, including a wide range of age, gender, income brackets, and stages in life. Initially, 154 people agreed to join the event, which was comprised of 79.9% females and 20.1% males. Fourteen marked the event as "maybe," which was 78.6% female and 21.4% male. One hundred five declined the initial invitation, which was 61.9 % female and 38.1% male. The remainder of individuals invited who did not respond as "attending," "maybe," or "declined" was 500, with 65.6 % female and 34.4 % male. From that point, participants continued to invite others to the Facebook event, which later led to over 2,000 people being invited.

Once the surveys were completed and submitted, the data were entered into Microsoft Excel. This program served to create tables to organize the data, as well as a means to calculate the descriptive statistics, such as the mean, standard deviation from the norm, and the 95% confidence level. Such statistics were based on the number of participants who answered yes for each question. Percentages of answers for each question were calculated by cross multiplying the number of "yes" answers with 100 and then dividing by the total number. In order to accurately represent the population sampled, surveys were categorized first by age, then gender, and finally by income brackets. Additionally, data were color-coded to separate gender, income brackets, and survey participants whose answers remained the same in the two surveys. However, the data calculated were not a true representation of the population, as the sample size was too small. In order to attain an accurate representation, a larger sample would need to be surveyed and further researched.

CHAPTER 5

RESULTS AND DATA ANALYSIS

Aggregate Results

One hundred eighteen two-part surveys were completed. Of those, 56 participants, or 47.46%, changed their answers from the first survey to the next, while 62 participants, or 52.54%, maintained the same answers from the first survey to the next. The following age ranges participated: 18 through 19, 20 through 29, 30 through 39, 40 through 49, 50 through 59, 60 through 69, and 70 through 79. Of the 118 participants, 20.34% were in the age range of 18 through 19, 59.32% were in the age range of 20 through 29, 11.02% were in the age range of 30 through 39, 3.39% were in the age range of 40 through 49, 4.24% were in the age range of 50 through 59, 0.85% were in the age range of 60 through 69, and 0.85% were in the age range of 70 through 79. Overall, 75.42% of participants were female, with 24.58% of participants being male.

In terms of overall results, 66.1% recycled, while 33.9% did not. However, of the 33.9% that did not recycle, 67.5% answered that they would recycle if they had access to a recycling facility. A total of 32.5%, though, consistently maintained that they would not recycle regardless of whether or not they had access.

Regarding Survey 1, 92.37% of participants preferred environmentally sustainable packaging over traditional packaging, leaving 7.63% who did not. Survey 2, however, showed that the number of participants that preferred environmentally sustainable packaging increased to 94.92%, with 5.08% not desiring more environmentally safe materials. Of all participants,

2.54% who originally answered yes to preferring more environmental products changed his or her answer to no, when taking Survey 2.

For example, if there had been a sufficient number of participants for the study, the survey results would have been divided into the previously identified age ranges and then further divided into male and female overall results for each age range. Lastly, overall answers would have been derived from various income brackets. The following serves as an example of how the study would have further been divided and subdivided to analyze the statistical results. The analysis is, therefore, not a true representation of the population and should not be considered otherwise. In addition, descriptive statistics were calculated based on the number of participants who answered yes to each question for each age range. As this also serves as an example for a larger study, the analysis of the descriptive statistics is found in Appendix C.

18 Through 19 Age Range

Twenty-four participants, 5 being male and 19 being female, were in the 18 to 19 age range. The average age was 18.04 years. Of the 24 participants, 33.3% maintained the same answers, while 66.7% changed answers from the first survey to the second survey.

In terms of survey statistics, 58.3% of participants had access to a recycling facility, while 41.7% did not. A total of 33.3% recycled, while 66.7% did not. However, 79.2% claimed they would recycle if they had access. Regarding the use of plastic packaging and polystyrene packaging, 45.8% answered that they preferred plastic over polystyrene, with 54.2% not. However, after reading the education portion, Survey 2 results decreased to 33.3% of participants who preferred the use of plastic packaging over polystyrene packaging. For Survey 1, 37.5% of participants preferred polystyrene over plastic, while for Survey 2, 62.5% chose polystyrene over

plastic. In terms of coated paper products, 20.8% of participants preferred this type of packaging, while for Survey 2 the percentage increased slightly to 33.3%. The number of participants who preferred biodegradable packaging over traditional packaging totaled 79.2%, which increased to 87.5% with Survey 2 results. When presented as packaging that increases shelf life, 50% preferred active and intelligent packaging, while after the education portion, Survey 2 results increased to 66.7%. In terms of biodegradable packaging and packaging with active and intelligent components, 70.8% of participants preferred biodegradable packaging. However, Survey 2 displayed increased preference of 83.3% of participants. Overall, 79.2% of participants preferred environmentally sustainable packaging over the use of traditional packaging materials.

Gender-Based Results

To further divide the statistics, in terms of male versus female results, Table 1 displays the survey results for each gender. For Survey 1, regarding recycling, 60% of males recycled, while only 26.3% of females recycled. However, if given access to a recycling facility, 100% of males would recycle, while only 73.7% of females would recycle. When asked about preference for environmentally sustainable packaging materials, 100% of males preferred such, while only 73.7% of females preferred environmentally safe products. Concerning Survey 2, 100% males still preferred more environmentally sustainable materials, while female demand for such increased to 78.9%.

Table 1

Gender-Based Results: 18-19 Age Range

		Male					Female			
SURVEY 1	**YES**	**NO**			**SURVEY 1**	**YES**	**NO**			
1	3	2	60.00%	40.00%	1	9	10	47.40%	52.60%
2	3	2	60.00%	40.00%	2	5	14	26.30%	73.70%
3	5	0	100.00%	0.00%	3	14	5	73.70%	26.30%
4	4	1	80.00%	20.00%	4	7	12	36.80%	63.20%
5	1	4	20.00%	80.00%	5	8	11	42.10%	57.90%
6	1	4	20.00%	80.00%	6	4	15	21.10%	78.90%
7	4	1	80.00%	20.00%	7	15	4	78.90%	21.10%
8	4	1	80.00%	20.00%	8	8	11	42.10%	57.90%
9	4	1	80.00%	20.00%	9	13	6	68.40%	31.60%
10	5	0	100.00%	0.00%	10	14	5	73.70%	26.30%
SURVEY 2	**YES**	**NO**			**SURVEY 2**	**YES**	**NO**			
1	3	2	60.00%	40.00%	1	9	10	47.40%	52.60%
2	3	2	60.00%	40.00%	2	5	14	26.30%	73.70%
3	4	1	80.00%	20.00%	3	14	5	73.70%	26.30%
4	2	3	40.00%	60.00%	4	6	13	31.60%	68.40%
5	3	2	60.00%	40.00%	5	12	7	63.20%	36.80%
6	2	3	40.00%	60.00%	6	6	13	31.60%	68.40%
7	5	0	100.00%	0.00%	7	16	3	84.20%	15.80%
8	2	3	40.00%	60.00%	8	14	5	73.70%	26.30%
9	5	0	100.00%	0.00%	9	15	4	78.90%	21.10%
10	5	0	100.00%	0.00%	10	15	4	78.90%	21.10%

Income Bracket-Based Results

In terms of further subdividing the data gathered, income variations among income brackets were established. Table 2 displays the results from the two-part surveys. The "Less than $20,000" income bracket showed that 59.1% of participants have access to a recycling facility, with 31.8% that recycled. A total of 77.3% claimed they would recycle if they had access. In terms of the "$20,000-35,000" income bracket, 50% of participants had access to a recycling facility, with 50% that recycled. However, if they had access, 100% claimed they would recycle. Concerning preference for more environmentally sustainable packaging over the

use of traditional packaging materials, the "Less than $20,000" income bracket maintained a solid 77.3% in favor of such between the first and second surveys. The "$20,000-35,000" income bracket, which was comprised of two participants, maintained a 100% preference between the two surveys.

Table 2

Income Bracket-Based Results: 18-19 Age Range

	Less than $20,000		22		$20,000-35,000		2	
SURVEY 1	**YES**	**NO**			**YES**	**NO**		
1	13	9	59.10%	40.90%	1	1	50%	50%
2	7	15	31.80%	68.20%	1	1	50%	50%
3	17	5	77.30%	22.70%	2	0	100%	0%
4	10	12	45.50%	54.50%	1	1	50%	50%
5	8	14	36.40%	63.60%	1	1	50%	50%
6	5	17	22.70%	77.30%	0	2	0%	100%
7	18	4	81.80%	18.20%	1	1	50%	50%
8	11	11	50%	50%	1	1	50%	50%
9	16	6	72.70%	27.30%	1	1	50%	50%
10	17	5	77.30%	22.70%	2	0	100%	0%
SURVEY 2	**YES**	**NO**			**YES**	**NO**		
1	13	9	59.10%	40.90%	1	1	50%	50%
2	7	15	31.80%	68.20%	1	1	50%	50%
3	16	6	72.70%	27.30%	2	0	100%	0%
4	8	14	36.40%	63.60%	0	2	0%	100%
5	13	9	59.10%	40.90%	2	0	100%	0%
6	7	15	31.80%	68.20%	1	1	50%	50%
7	20	2	90.90%	9.10%	1	1	50%	50%
8	16	6	72.70%	27.30%	0	2	0%	100%
9	18	4	81.80%	18.20%	2	0	100%	0%
10	17	5	77.30%	22.70%	2	0	100%	0%

20 Through 29 Age Range

Seventy participants, 17 being male and 53 being female, were in the 20 to 29 age range. The average age was 24.34 years. Of the 70 participants, 54.3% maintained the same answers, while 45.7% changed answers from the first survey to the second survey.

In terms of survey statistics, 78.6% of participants had access to a recycling facility, while 21.4% did not. A total of 67.1% recycled, while 32.9% did not. However, 88.6% claimed they would recycle if they had access. Regarding the use of plastic packaging and polystyrene packaging, 70% answered that they preferred plastic over polystyrene, with 30% not. After reading the education portion, Survey 2 results remained the same. For Survey 1, 12.9% of participants preferred polystyrene over plastic, while for Survey 2, 15.7% chose polystyrene over plastic. In terms of coated paper products, 37.1% of participants preferred this type of packaging, while for Survey 2 the percentage decreased slightly to 28.6%. The percent of participants who preferred biodegradable packaging over traditional packaging totaled 97.1%, which increased to 98.6% with Survey 2 results. When presented as packaging that increases shelf life, 78.6% preferred active and intelligent packaging, while after the education portion, Survey 2's results decreased to 71.4%. In terms of biodegradable packaging and packaging with active and intelligent components, 84.3% of participants preferred biodegradable packaging. However, Survey 2 displayed decreased preference of 80% of participants. When first asked in Survey 1 about preference of environmentally sustainable packaging, 94.3% answered they would prefer such materials over the use of traditional packaging. However, after the education portion of Survey 2, the results were 100% in favor of more environmentally safe products.

Gender-Based Results

To further divide the statistics in terms of male versus female results, Table 3 displays the survey results for each gender. For Survey 1, regarding recycling, 58.8% of males recycled, while 69.8% of females recycled. However, if given access to a recycling facility, 88.2% of males would recycle, while 88.7% of females would recycle. When asked about preference for environmentally sustainable packaging materials, 94.1% of males preferred such, while 94.3% of females preferred environmentally safe products. Concerning Survey 2, 100% of males and females preferred more environmentally sustainable materials.

Table 3

Gender-Based Results: 20-29 Age Range

		Male					Female			
SURVEY 1	**YES**	**NO**			**SURVEY 1**	**YES**	**NO**		
1	11	6	64.70%	35.30%	1	44	9	83.00%	17.00%
2	10	7	58.80%	41.20%	2	37	16	69.80%	30.20%
3	15	2	88.20%	11.80%	3	47	6	88.70%	11.30%
4	13	4	76.50%	23.50%	4	36	17	67.90%	32.10%
5	0	17	0.00%	100.00%	5	9	44	17.00%	83.00%
6	7	10	41.20%	58.80%	6	19	34	35.80%	64.20%
7	16	1	94.10%	5.90%	7	52	1	98.10%	1.90%
8	15	2	88.20%	11.80%	8	40	13	75.50%	25%
9	13	4	76.50%	23.50%	9	46	7	86.80%	13.20%
10	16	1	94.10%	5.90%	10	50	3	94.30%	5.70%
SURVEY 2	**YES**	**NO**			**SURVEY 2**	**YES**	**NO**		
1	11	6	64.70%	35.30%	1	44	9	83.00%	17.00%
2	10	7	58.80%	41.20%	2	38	15	71.70%	28.30%
3	15	2	88.20%	11.80%	3	47	6	88.70%	11.30%
4	13	4	76.50%	23.50%	4	36	17	67.90%	32.10%
5	1	16	5.90%	94.10%	5	10	43	18.90%	81.10%
6	7	10	41.20%	58.80%	6	13	40	24.50%	75.50%
7	17	0	100.00%	0.00%	7	52	1	98.10%	1.90%
8	16	1	94.10%	5.90%	8	34	19	64.20%	35.80%
9	14	3	82.40%	17.60%	9	42	11	79.20%	20.80%
10	17	0	100.00%	0.00%	10	53	0	100.00%	0.00%

Income Bracket-Based Results

In terms of further subdividing the data gathered, income variations among income brackets were established. Table 4 displays the results from the two-part surveys. The "Less than $20,000" income bracket showed that 78.8% of participants have access to a recycling facility, with 60.6% that recycled. A total of 87.9% claimed they would recycle if they had access. However, the "$35,000-50,000" income bracket displayed that 89.5% of participants had access to a recycling facility, with 78.9% that recycled. Despite that, 89.5% claimed they would recycle if they had access to a facility. Concerning the "$50,000-70,000" income bracket, 75% of participants had access to a recycling facility, with 66.7% who recycled. A total of 83.3% claimed they would recycle if they had access. In terms of the "$70,000-100,000" income bracket, 50% have access to a recycling facility, with 50% who recycled. Nevertheless, it was stated that if they had access, 100% of participants would recycle. Each income bracket showed that with the second survey, after the education portion, 100% of participants would prefer more environmentally sustainable packaging in place of traditional packaging materials.

Table 4

Income Bracket-Based Results: 20-29 Age Range

	Less than $20,000		33			$20,000-35,000		19	
SURVEY 1	**YES**	**NO**			**SURVEY 1**	**YES**	**NO**		
1	26	7	78.80%	21.20%	1	17	2	89.50%	10.50%
2	20	13	60.60%	39.40%	2	15	4	78.90%	21.10%
3	29	4	87.90%	12.10%	3	17	2	89.50%	10.50%
4	23	10	69.70%	30.30%	4	13	6	68.40%	31.60%
5	7	26	21.20%	78.80%	5	1	18	5.30%	94.70%
6	11	22	33.30%	66.70%	6	8	11	42.10%	57.90%
7	32	1	97.00%	3.00%	7	18	1	94.70%	5.30%
8	26	7	78.80%	21.20%	8	14	5	73.70%	26.30%
9	28	5	84.80%	15.20%	9	17	2	89.50%	10.50%
10	31	2	93.90%	6.10%	10	18	1	94.70%	5.30%

Table 4 (continued)

SURVEY 2	YES	NO			SURVEY 2	YES	NO		
1	28	5	84.80%	15.20%	1	17	2	89.50%	10.50%
2	22	11	66.70%	33.30%	2	15	4	78.90%	21.10%
3	29	4	87.90%	12.10%	3	17	2	89.50%	10.50%
4	22	11	66.70%	33.30%	4	15	4	78.90%	21.10%
5	6	27	18.20%	81.80%	5	17	2	89.50%	10.50%
6	7	26	21.20%	78.80%	6	5	14	26.30%	73.70%
7	32	1	97.00%	3.00%	7	19	0	100%	0%
8	24	9	72.70%	27.30%	8	15	4	78.90%	21.10%
9	27	6	81.80%	18.20%	9	17	2	89.50%	10.50%
10	33	0	100%	0%	10	19	0	100%	0%
	$35,000-50,000		12			$50,000-70,000		6	
SURVEY 1	YES	NO			SURVEY 1	YES	NO		
1	9	3	75%	25%	1	3	3	50%	50%
2	8	4	66.70%	33.30%	2	3	3	50%	50%
3	10	2	83.30%	16.70%	3	6	0	100%	0%
4	10	2	83.30%	16.70%	4	3	3	50%	50%
5	0	12	0%	100%	5	5	1	83.30%	16.70%
6	6	6	50%	50%	6	1	5	16.70%	83.30%
7	12	0	100%	0%	7	6	0	100%	0%
8	9	3	75%	25%	8	5	1	83.30%	16.70%
9	10	2	83.30%	16.70%	9	4	2	66.70%	33.30%
10	12	0	100%	0%	10	6	0	100%	0%
SURVEY 2	YES	NO			SURVEY 2	YES	NO		
1	9	3	75%	25%	1	3	3	50%	50%
2	8	4	66.70%	33.30%	2	3	3	50%	50%
3	10	2	83.30%	16.70%	3	6	0	100%	0%
4	10	2	83.30%	16.70%	4	3	3	50%	50%
5	2	10	16.70%	83.30%	5	5	1	83.30%	16.70%
6	6	6	50%	50%	6	2	4	33.30%	66.70%
7	12	0	100%	0%	7	6	0	100%	0%
8	8	4	66.70%	33.30%	8	3	3	50%	50%
9	9	3	75%	25%	9	6	0	100%	0%
10	12	0	100%	0%	10	6	0	100%	0%

30 Through 39 Age Range

Thirteen participants, 4 being male and 9 being female, were in the 30 to 39 age range. The average age was 33.54 years. Of the 13 participants, 61.5% maintained the same answers, while 38.5% changed answers from the first survey to the second survey.

In terms of survey statistics, 76.9% of participants had access to a recycling facility, while 21.3% did not. A total of 61.5% recycled, while 38.5% did not. However, 84.6% claimed they would recycle if they had access. Regarding the use of plastic packaging and polystyrene packaging, 100% answered that they prefer plastic over polystyrene. Interestingly, though, after reading the education portion, Survey 2 results remained the same. For Survey 1, 7.7% of participants preferred polystyrene over plastic, while for Survey 2, 15.4% chose polystyrene over plastic. In terms of coated paper products, 38.5% of participants preferred this type of packaging, while for Survey 2, the percentage decreased slightly to 30.8%. The number of participants who preferred biodegradable packaging over traditional packaging totaled 100%, which remained the same with Survey 2 results. When presented as packaging that increases shelf life, 76.9% preferred active and intelligent packaging, while after the education portion, Survey 2 results increased to 84.6%. In terms of biodegradable packaging and packaging with active and intelligent components, 100% of participants preferred biodegradable packaging. Again, Survey 2 did not display varying results, with participants still having preference for biodegradable packaging over active and intelligent materials. When asked about preference of environmentally sustainable packaging, 100% answered for both surveys that they would prefer such materials over the use of traditional packaging.

Gender-Based Results

To further divide the statistics, in terms of male versus female results, Table 5 displays survey results for each gender. For Survey 1, regarding recycling, 50% of males recycled, while 66.7% of females recycled. However, if given access to a recycling facility, 75% of males would recycle, while only 88.9% of females would recycle. When asked about preference for environmentally sustainable packaging materials, 100% of males and females preferred such. Concerning Survey 2, 100% of males and females still preferred more environmentally sustainable materials.

Table 5

Gender-Based Results: 30-39 Age Range

		Male					Female			
SURVEY 1	**YES**	**NO**			**SURVEY 1**	**YES**	**NO**			
1	3	1	75.00%	25.00%	1	7	2	77.80%	22.20%	
2	2	2	50.00%	50.00%	2	6	3	66.70%	33.30%	
3	3	1	75.00%	25.00%	3	8	1	88.90%	11.10%	
4	4	0	100%	0%	4	9	0	100%	0%	
5	0	4	0%	100%	5	1	8	11.10%	88.90%	
6	0	4	0%	100%	6	5	4	55.60%	44.40%	
7	4	0	100%	0%	7	9	0	100%	0%	
8	4	0	100%	0%	8	6	3	66.70%	33.30%	
9	4	0	100%	0%	9	9	0	100%	0%	
10	4	0	100%	0%	10	9	0	100%	0%	
SURVEY 2	**YES**	**NO**			**SURVEY 2**	**YES**	**NO**			
1	3	1	75.00%	25.00%	1	7	2	77.80%	22.20%	
2	2	2	50.00%	50.00%	2	6	3	66.70%	33.30%	
3	3	1	75.00%	25.00%	3	8	1	88.90%	11.10%	
4	4	0	100%	0%	4	9	0	100%	0%	
5	0	4	0%	100%	5	2	7	22.20%	77.80%	
6	0	4	0%	100%	6	4	5	44.40%	55.60%	
7	4	0	100%	0%	7	9	0	100%	0%	
8	4	0	100%	0%	8	7	2	77.80%	22.20%	
9	4	0	100%	0%	9	9	0	100%	0%	
10	4	0	100%	0%	10	9	0	100%	0%	

Income Bracket-Based Results

In terms of further subdividing the data gathered, income variations among income brackets were established. Table 6 displays the results from the two-part surveys. The "Less than $20,000" income bracket showed that 100% of participants have access to a recycling facility, with only 50% that recycled. However, the "$35,000-50,000" income bracket displayed that only 80% of participants had access to a recycling facility, with 60% that recycled. Despite that, 80% claimed they would recycle if they had access to a facility. Concerning the "$50,000-70,000" income bracket, 50% of participants had access to a recycling facility, with 50% who recycled. Nevertheless, 100% claimed they would recycle if they had access. In terms of the "$70,000-100,000" income bracket, 66.7% have access to a recycling facility, with 66.7% who recycled. Much like the previous income bracket, it was stated that if they had access, 100% of participants would recycle. Regarding the "Over $100,000" income bracket, 100%, which was comprised of one participant, had access to a recycling facility, with 100% that recycled. Each income bracket showed that 100% of participants would prefer more environmentally sustainable packaging in place of traditional packaging materials.

Table 6

Income Bracket-Based Results: 30-39 Age Range

	Less than $20,000		2			$35,000-50,000		5	
SURVEY 1	**YES**	**NO**			**SURVEY 1**	**YES**	**NO**		
1	2	0	100%	0%	1	4	1	80%	20%
2	1	1	50%	50%	2	3	2	60%	40%
3	1	1	50%	50%	3	4	1	80%	20%
4	2	0	100%	0%	4	5	0	100%	0%
5	0	2	0%	100%	5	1	4	20%	80%
6	1	1	50%	50%	6	1	4	20%	80%
7	2	0	100%	0%	7	5	0	100%	0%
8	2	0	100%	0%	8	3	2	60%	40%

Table 6 (continued)

9	2	0	100%	0%	9	5	0	100%	0%
10	2	0	100%	0%	10	5	0	100%	0%
SURVEY 2	**YES**	**NO**			**SURVEY 2**	**YES**	**NO**		
1	2	0	100%	0%	1	4	1	80%	20%
2	1	1	50%	50%	2	3	2	60%	40%
3	1	1	50%	50%	3	4	1	80%	20%
4	2	0	100%	0%	4	5	0	100%	0%
5	0	2	0%	100%	5	1	4	20%	80%
6	1	1	50%	50%	6	1	4	20%	80%
7	2	0	100%	0%	7	5	0	100%	0%
8	2	0	100%	0%	8	3	2	60%	40%
9	2	0	100%	0%	9	5	0	100%	0%
10	2	0	100%	0%	10	5	0	100%	0%
	$50,000-70,000		2			$70,000-100,000		3	
SURVEY 1	**YES**	**NO**			**SURVEY 1**	**YES**	**NO**		
1	1	1	50%	50%	1	2	1	66.70%	33.30%
2	1	1	50%	50%	2	2	1	66.70%	33.30%
3	2	0	100%	0%	3	3	0	100%	0%
4	2	0	100%	0%	4	3	0	100%	0%
5	0	2	0%	100%	5	0	3	0%	100%
6	1	1	50%	50%	6	1	2	33.30%	66.70%
7	2	0	100%	0%	7	3	0	100%	0%
8	1	1	50%	50%	8	3	0	100%	0%
9	2	0	100%	0%	9	3	0	100%	0%
10	2	0	100%	0%	10	3	0	100%	0%
SURVEY 2	**YES**	**NO**			**SURVEY 2**	**YES**	**0**		
1	1	1	50%	50%	1	2	1	66.70%	33.30%
2	1	1	50%	50%	2	2	1	66.70%	33.30%
3	2	0	100%	0%	3	3	0	100%	0%
4	2	0	100%	0%	4	3	0	100%	0%
5	0	2	0%	100%	5	1	2	33.30%	66.70%
6	0	2	0%	100%	6	1	2	33.30%	66.70%
7	2	0	100%	0%	7	3	0	100%	0%
8	2	0	100%	0%	8	3	0	100%	0%
9	2	0	100%	0%	9	3	0	100%	0%
10	2	0	100%	0%	10	3	0	100%	0%
	Over $100,000		1						

Table 6 (continued)

SURVEY 1	YES	NO		
1	1	0	100%	0%
2	1	0	100%	0%
3	1	0	100%	0%
4	1	0	100%	0%
5	0	1	0%	100%
6	1	0	100%	0%
7	1	0	100%	0%
8	1	0	100%	0%
9	1	0	100%	0%
10	1	0	100%	0%
SURVEY 2	**YES**	**NO**		
1	1	0	100%	0%
2	1	0	100%	0%
3	1	0	100%	0%
4	1	0	100%	0%
5	0	1	0%	100%
6	1	0	100%	0%
7	1	0	100%	0%
8	1	0	100%	0%
9	1	0	100%	0%
10	1	0	100%	0%

40 Through 49 Age Range

Four participants, one being male and three being female, were in the 40 through 49 age range. The average age was 41.75 years. Of the four participants, 100% maintained the same answers for both the first and second survey.

In terms of survey statistics, 75% of participants had access to a recycling facility, while 25% did not. Fifty percent recycled. However, 75% claimed they would recycle if they had access. Regarding the use of plastic packaging and polystyrene packaging, 100% answered that they preferred plastic over polystyrene. Interesting, though, after reading the education portion,

Survey 2 results remained the same. For Survey 1 and Survey 2 none of the participants preferred polystyrene over plastic. In terms of coated paper products, 50% of participants preferred this type of packaging, with results remaining the same with both Survey 1 and Survey 2. The number of participants that preferred biodegradable packaging over traditional packaging totaled 100%, with results remaining the same with Survey 2. When presented as packaging that increases shelf life, 50% preferred active and intelligent packaging, with results remaining the same with Survey 2. In terms of biodegradable packaging and packaging with active and intelligent components, 100% of participants preferred biodegradable packaging, with no varying results for Survey 2. When about preference of environmentally sustainable packaging, 100% answered for both surveys that they would prefer such materials over the use of traditional packaging.

Gender-Based Results

To further divide the statistics, in terms of male versus female results, Table 7 displays the survey results for each gender. For Survey 1, regarding recycling, zero percent of the one male participant recycled, while 66.7% of females recycled. However, if given access to a recycling facility, the male participant would recycle, while only 66.7% of females would recycle. When asked about preference for environmentally sustainable packaging materials, 100% of both genders preferred such. Concerning Survey 2, 100% of males and females still preferred more environmentally sustainable materials.

Table 7

Gender-Based Results: 40-49 Age Range

	Male					Female				
SURVEY 1		**YES**	**NO**			**SURVEY 1**		**YES**	**NO**		
	1	0	1	0%	100%		1	3	0	100%	0%
	2	0	1	0%	100%		2	2	1	66.70%	33.30%
	3	1	0	100%	0%		3	2	1	66.70%	33.30%
	4	1	0	100%	0%		4	3	0	100%	0%
	5	0	1	0%	100%		5	0	3	0%	100%
	6	1	0	100%	0%		6	1	2	33.30%	66.70%
	7	1	0	100%	0%		7	3	0	100%	0%
	8	0	1	0%	100%		8	2	1	66.70%	33.30%
	9	1	0	100%	0%		9	3	0	100%	0%
	10	1	0	100%	0%		10	3	0	100%	0%
SURVEY 2		**YES**	**NO**			**SURVEY 2**		**YES**	**NO**		
	1	0	1	0%	100%		1	3	0	100%	0%
	2	0	1	0%	100%		2	2	1	66.70%	33.30%
	3	1	0	100%	0%		3	2	1	66.70%	33.30%
	4	1	0	100%	0%		4	3	0	100%	0%
	5	0	1	0%	100%		5	0	3	0%	100%
	6	1	0	100%	0%		6	1	2	33.30%	66.70%
	7	1	0	100%	0%		7	3	0	100%	0%
	8	0	1	0%	100%		8	2	1	66.70%	33.30%
	9	1	0	100%	0%		9	3	0	100%	0%
	10	1	0	100%	0%		10	3	0	100%	0%

Income Bracket-Based Results

In terms of further subdividing the data gathered, income variations among income brackets were established. Table 8 displays the results from the two-part surveys. The "$20,000-35,000" income bracket, which was comprised of one participant, showed that zero percent had access to a recycling facility, with zero percent who recycled. However, there was a 100% response in favor of recycling if there was appropriate access. The "$50,000-70,000" income bracket displayed that 100% of participants had access to a recycling facility, with only 66.7% that recycled. Even with recycling access, it was maintained that only 66.7% would

recycle. In terms of the "$70,000-100,000" income bracket, 50% have access to a recycling facility, with 50% who recycled. Nevertheless, it was stated that if they had access, 100% of participants would recycle. Regardless of recycling preference, each income bracket showed that 100% of participants would prefer more environmentally sustainable packaging in place of traditional packaging materials.

Table 8

Income Bracket-Based Results: 40-49 Age Range

	$20,000-35,000		1			$50,000-70,000		3	
SURVEY 1	**YES**	**NO**			**SURVEY 1**	**YES**	**NO**		
1	0	1	0%	100%	1	3	0	100%	0%
2	0	1	0%	100%	2	2	1	66.70%	33.30%
3	1	0	100%	0%	3	2	1	66.70%	33.30%
4	1	0	100%	0%	4	3	0	100%	0%
5	0	1	0%	100%	5	0	3	0%	100%
6	1	0	100%	0%	6	1	2	33.30%	66.70%
7	1	0	100%	0%	7	3	0	100%	0%
8	0	1	0%	100%	8	2	1	66.70%	33.30%
9	1	0	100%	0%	9	3	0	100%	0%
10	1	0	100%	0%	10	3	0	100%	0%
SURVEY 2	**YES**	**NO**			**SURVEY 2**	**YES**	**NO**		
1	0	1	0%	100%	1	3	0	100%	0%
2	0	1	0%	100%	2	2	1	66.70%	33.30%
3	1	0	100%	0%	3	2	1	66.70%	33.30%
4	1	0	100%	0%	4	3	0	100%	0%
5	0	1	0%	100%	5	0	3	0%	100%
6	1	0	100%	0%	6	1	2	33.30%	66.70%
7	1	0	100%	0%	7	3	0	100%	0%
8	0	1	0%	100%	8	2	1	66.70%	33.30%
9	1	0	100%	0%	9	3	0	100%	0%
10	1	0	100%	0%	10	3	0	100%	0%

50 Through 59 Age Range

A total of five participants, one being male and four being female, were in the 50 to 59 age range. The average age was 55 years. Of the five participants, 60% maintained the same answers, while 40% changed answers from the first survey to the second survey.

In terms of survey statistics, 100% of participants had access to a recycling facility. Eighty percent recycled, while 20% did not. Regarding the use of plastic packaging and polystyrene packaging, 20% answered that they preferred the plastic over polystyrene, with 80% not. However, after reading the education portion, Survey 2 results increased to 60% of participants who preferred the use of plastic packaging over polystyrene packaging. For Survey 1, 40% of participants preferred polystyrene over plastic, while for Survey 2, none chose polystyrene over plastic. In terms of coated paper products, 100% of participants preferred this type of packaging, while for Survey 2, the percentage decreased to 60%. The number of participants who preferred biodegradable packaging over traditional packaging totaled 100% for both Survey 1 and Survey 2. When presented as packaging that increases shelf life, 20% preferred active and intelligent packaging, while after the education portion, Survey 2's results increased to 60%. In terms of biodegradable packaging and packaging with active and intelligent components, 100% of participants preferred biodegradable packaging. However, Survey 2 displayed decreased preference of 80% of participants. When asked about preference of environmentally sustainable packaging, 100% answered for both surveys that they would prefer such materials over the use of traditional packaging.

Gender-Based Results

To further divide the statistics, in terms of male versus female results, Table 9 displays the survey results for each gender. For Survey 1, regarding recycling, 100% of males recycled, while 75% of females recycled. If given access to a recycling facility, the results remained the same in terms of percentages. When asked about preference for environmentally sustainable packaging materials, 100% of both genders preferred such. Concerning Survey 2, 100% of males and females still preferred more environmentally sustainable materials.

Table 9

Gender-Based Results: 50-59 Age Range

		Male					Female			
SURVEY 1	**YES**	**NO**			**SURVEY 1**	**YES**	**NO**		
1	1	0	100.00%	0.00%	1	4	0	100%	0%
2	1	0	100.00%	0.00%	2	3	1	75.00%	25.00%
3	1	0	100.00%	0.00%	3	3	1	75.00%	25.00%
4	1	0	100.00%	0.00%	4	0	0	0%	100%
5	0	1	0.00%	100.00%	5	2	2	50.00%	50.00%
6	1	0	100.00%	0.00%	6	4	0	100%	0%
7	1	0	100.00%	0.00%	7	4	0	100%	0%
8	1	0	100.00%	0.00%	8	0	4	0%	100%
9	1	0	100.00%	0.00%	9	4	0	100%	0%
10	1	0	100.00%	0.00%	10	4	0	100%	0%
SURVEY 2	**YES**	**NO**			**SURVEY 2**	**YES**	**NO**		
1	1	0	100.00%	0.00%	1	4	0	100%	0%
2	1	0	100.00%	0.00%	2	3	1	75.00%	25.00%
3	1	0	100.00%	0.00%	3	3	1	75.00%	25.00%
4	1	0	100.00%	0.00%	4	2	2	50.00%	50.00%
5	0	1	0.00%	100.00%	5	0	4	0%	100%
6	1	0	100.00%	0.00%	6	2	2	50.00%	50.00%
7	1	0	100.00%	0.00%	7	4	0	100%	0%
8	1	0	100.00%	0.00%	8	2	2	50.00%	50.00%
9	1	0	100.00%	0.00%	9	3	1	75.00%	25.00%
10	1	0	100.00%	0.00%	10	4	0	100%	0%

Income Bracket-Based Results

In terms of further subdividing the data gathered, income variations among income brackets were established. Table 10 displays the results from the two-part surveys. Both the "Less than $20,000" and "$20,000-35,000" income brackets display that 100% of participants have access to a recycling facility and did, in fact, recycle. However, in terms of the "$35,000-50,000" income bracket, 100% have access to a recycling facility, but only 50% recycled. Regardless of recycling preference, each income bracket showed that 100% of participants would prefer more environmentally sustainable packaging in place of traditional packaging materials.

Table 10

Income Bracket-Based Results: 50-59 Age Range

	Less than $20,000		2		$20,000-35,000		1	
SURVEY 1	**YES**	**NO**			**YES**	**NO**		
1	2	0	100%	0%	1	0	100%	0%
2	2	0	100%	0%	1	0	100%	0%
3	2	0	100%	0%	1	0	100%	0%
4	1	1	50%	50%	0	1	0%	100%
5	0	2	0%	100%	1	0	100%	0%
6	2	0	100%	0%	1	0	100%	0%
7	2	0	100%	0%	1	0	100%	0%
8	1	1	50%	50%	0	1	0%	100%
9	2	0	100%	0%	1	0	100%	0%
10	2	0	100%	0%	1	0	100%	0%
SURVEY 2	**YES**	**NO**			**YES**	**NO**		
1	2	0	100%	0%	1	0	100%	0%
2	2	0	100%	0%	1	0	100%	0%
3	2	0	100%	0%	1	0	100%	0%
4	1	1	50%	50%	1	0	100%	0%
5	0	2	0%	100%	0	1	0%	100%
6	2	0	100%	0%	0	1	0%	100%
7	2	0	100%	0%	1	0	100%	0%

Table 10 (continued)

8	1	1	50%	50%	1	0	100%	0%
9	2	0	100%	0%	0	1	0%	100%
10	2	0	100%	0%	1	0	100%	0%

$35,000-50,000		2	
YES	**NO**		
2	0	100%	0%
1	1	50%	50%
1	1	50%	50%
0	2	0%	100%
1	1	50%	50%
2	0	100%	0%
2	0	100%	0%
0	2	0%	100%
2	0	100%	0%
2	0	100%	0%
YES	**NO**		
2	0	100%	0%
1	1	50%	50%
1	1	50%	50%
1	1	50%	50%
0	2	0%	100%
1	1	50%	50%
2	0	100%	0%
1	1	50%	50%
2	0	100%	0%
2	0	100%	0%

60 Through 69 Age Range

For the age range of 60 through 69, there was only one participant. The male individual was 60 years of age. From the first survey to the next, his answers varied. He answered that he did have access to a recycling facility, and he, in fact, did recycle. However, his answers did not vary when asked about preference of environmentally sustainable packaging materials, as he was in favor of such.

70 Through 79 Age Range

For the age range of 70 through 79, there was only one participant. The female individual was 72 years of age. From the first survey to the next, her answers remained the same. For instance, she did not have access to a recycling facility, and therefore, she did not recycle. However, she claimed that if she did have access, she would recycle. Much like the previous age category participant, she, too, maintained her answers between the two surveys that she favored a preference of more environmentally sustainable packaging in place of the use of traditional materials.

Triple Bottom Line

In terms of a company's bottom line, the increasing demand for more environmentally safe products would only serve to enhance and improve the societal, environmental, and economic aspects. More specifically, the societal aspect is affected by meeting the wants and needs of consumers who are so greatly demanding safer products and materials. Subsequently, the environment can only be improved by such a directional move, as less harmful toxins will be leached into the earth. Finally, if there is consumer demand for more sustainable products, there is a willingness to purchase such products. This will serve to positively impact the economic aspect of the triple bottom line. However, further studies would need to be performed in order to determine projections of business success. This study only serves to suggest that the triple bottom line would be affected in a positive growth-promoting manner.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

As previously stated, in order for this study to prove to be a true representation of the population, more participants are needed. However, this study serves the purpose of providing an example for appropriate methodology that can contribute to further research.

In addition, the use of education as a means of informing participants did result in a change of results from Survey 1 to Survey 2 of close to 50%. While conclusive results cannot be drawn, the data suggest that educating the population sampled did have a positive impact on the study. Over 90% of the participants answered that they prefer more environmentally sustainable packaging materials in place of traditional packaging products.

Nevertheless, further research must be done to acquire accurate statistics. Otherwise, the results are skewed, with such a small population size. Overall, the sample leads to the conclusion that there is a demand for more environmentally safe products. However, as previously stated, participants would need to be surveyed to see if said demand would remain the same if it affected the cost of the packaging products. Another study should be performed, using a larger population, and then, the results of the new, larger study should be compared to that of this study.

With education on health risks and environmental concerns proving to influence the buying decision of more environmental products, the hypothesis will not be rejected. In order to determine the alternative hypothesis, further research and increased data are required. In the end, regardless of whether it is preference of plastic over polystyrene or the contrary, the demand exists. As such, this study suggests that the triple bottom line would be positively impacted, but

further studies would need to be performed in order to determine if it would be an economical decision.

This study is applicable for those performing research of consumer demand of environmental products. While it was specific to the fast food industry and the packaging used for the food and drinks consumed, it can be applied in other avenues as well. As a growing trend, this study has proven that regardless of the preference of certain environmentally safe products versus other health-enriching materials the majority of the studied population is in favor of sustainability.

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APPENDIXES

Appendix A: Surveys.

Survey 1

PART I

DETERMINGING CUSTOMER DEMAND SURVEY

Please complete each question in order for your survey to be included in the results.

AGE ___ BIRTHDATE ___ GENDER _____

Please mark or highlight the range that estimates your income bracket.

ANNUAL INCOME BRACKET	Less than $20,000	$20,000-35,000	$35,000-50,000
	$50,000-70,000	$70,000-100,000	Over $100,000

Please complete each question in order for your survey to be included in the results.
Please mark or highlight yes or no.

1)	Do you have access to a recycling facility?	YES	NO
2)	Do you recycle?	YES	NO
3)	If you had access to a recycling facility, would you recycle?	YES	NO
4)	In terms of fast food packaging, do you prefer the use of plastics over the use of styrofoam (polystyrene)?	YES	NO
5)	In terms of fast food packaging, do you prefer the use of styrofoam (polystyrene) over the use of plastics?	YES	NO
6)	In terms of fast food packaging, do you prefer the use of coated paper products?	YES	NO
7)	If offered, would you prefer the use of fast food packaging that would biodegrade (compost) over the use of traditional fast food packaging?	YES	NO
8)	If offered, would you prefer the use of fast food packaging that has active and intelligent components, which extend shelf-life and maintain the quality of the food, over the use of traditional fast food packaging?	YES	NO
9)	If offered, would you prefer fast food packaging that		

Survey 1 (continued)

	biodegrades (composts) over active and intelligent fast food packaging?	YES	NO
10)	Do you prefer more environmentally sustainable fast food packaging over traditional fast food packaging?	YES	NO

Survey 2

PART II

DETERMINGING CUSTOMER DEMAND SURVEY

Please complete each question in order for your survey to be included in the results.

AGE _____ BIRTHDATE ___ GENDER _____

Please mark or highlight the range that estimates your income bracket.

ANNUAL INCOME BRACKET	Less than $20,000	$20,000-35,000	$35,000-50,000
	$50,000-70,000	$70,000-100,000	Over $100,000

Please complete each question in order for your survey to be included in the results.

Please mark or highlight yes or no.

1)	Do you have access to a recycling facility?	YES	NO
2)	Do you recycle?	YES	NO
3)	If you had access to a recycling facility, would you recycle?	YES	NO

As a result of product leaching, packaged food is exposed to chemical compound ingredients from its packaging, a process known as migrating. Plastic packaging can contain endocrine disruptors that can migrate into packaged food (Muncke, 2009).

The endocrine system functions by receiving chemical messages from hormones, which regulate reproduction, metabolism, growth and development, natural stress defenses, in addition to water, electrolyte, and nutritional balance of the blood (LaFleur & Schug, 2011).

Landfilling polystyrene materials is detrimental to the environment, with toxic chemicals that make up the material leaching into the soil as it decomposes. If said chemicals leach into the soil, the groundwater could be contaminated. While water treatment facilities do filter incoming water, some chemicals are missed. As the result of a detrimental cycle, an initial environmental danger can later become a health threat to consumers (Puente & Sedran, 1998).

4) In terms of fast food packaging, do you prefer the use of plastics over the use of styrofoam (polystyrene)? YES NO

5) In terms of fast food packaging, do you prefer the use of styrofoam (polystyrene) over the use of plastics? YES NO

In terms of paper food packaging, perfluorinated compounds are released through migration (Muncke, 2009).

6) In terms of fast food packaging, do you prefer the use of coated paper products? YES NO

In regards to biodegradable packaging materials, it is becoming increasingly necessary since global consumption on plastics has exceeded 200 million tons, with an annual growth rate of five percent. Biodegradable packaging naturally composts without detriment to the environment and acts as fertilizers and soil conditioners (Rocculi, Romani, Rosa, & Siracusa, 2008).

There is limited knowledge and scientific data regarding migration of nanoparticles from the packaging material to the food source. It is also not widely known the toxicological impacts on consumers from such migrants (Azeredo, 2009).

7) If offered, would you prefer the use of fast food packaging that would biodegrade (compost) over the use of traditional fast food packaging? YES NO

Active and intelligent packaging is designed to reduce moisture and food-borne pathogens, resulting in a longer shelf-life. The intelligent portion of the packaging contains sensors that indicate the freshness of the product. While chemical migrating is an issue, is has been determined through research, the doses are of acceptable levels (Cirillo et al., 2010).

8) If offered, would you prefer the use of fast food packaging that has active and intelligent components, which extend shelf-life and maintain the quality of the food, over the use of traditional fast food packaging? YES NO

9) If offered, would you prefer fast food packaging that biodegrades (composts) over active and intelligent fast food packaging? YES NO

10) Do you prefer more environmentally sustainable fast food

packaging over traditional fast food packaging? YES NO

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Appendix B: Survey Results.

Survey Results: 18-19 Age Range

	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2
AGE	18		19		18		18		18	
M/F	F		F		F		F		F	
INCOME	Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000	
1	Y	Y	Y	Y	Y	Y	N	N	Y	Y
2	N	N	N	N	Y	Y	N	N	N	N
3	N	N	N	N	Y	Y	Y	Y	N	N
4	N	N	N	N	N	Y	Y	N	Y	N
5	Y	Y	Y	Y	Y	N	N	Y	N	Y
6	N	N	N	N	N	N	N	Y	Y	Y
7	Y	Y	Y	Y	Y	Y	N	N	Y	Y
8	N	N	Y	Y	N	N	Y	Y	N	Y
9	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
10	Y	Y	Y	Y	Y	Y	N	N	Y	N

	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2
AGE	18		18		18		18		18	
M/F	F		F		F		F		F	
INCOME	Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000	
1	Y	Y	Y	Y	Y	Y	N	N	N	N
2	N	N	N	N	Y	Y	N	N	N	N
3	Y	Y	N	N	Y	Y	Y	Y	Y	Y
4	Y	Y	Y	Y	Y	Y	N	N	N	N
5	N	N	N	N	N	N	N	Y	Y	Y
6	N	N	N	Y	N	N	N	N	N	N
7	Y	Y	Y	Y	Y	Y	N	N	Y	Y
8	N	Y	Y	Y	Y	Y	N	Y	N	Y
9	Y	N	Y	Y	N	Y	N	N	N	N
10	Y	Y	Y	Y	Y	Y	N	Y	N	Y

	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2
AGE	18		18		18		18		18	
M/F	F		F		F		F		F	
INCOME	Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000	
1	N	N	N	N	N	N	Y	Y	Y	Y
2	N	N	N	N	N	N	Y	Y	N	N
3	Y	Y	Y	Y	N	N	Y	Y	Y	Y

Survey Results: 18-19 Age Range (continued)

4	N	N	N	N	N	N	Y	Y
5	N	Y	Y	Y	Y	Y	N	N
6	N	N	N	N	Y	Y	N	N
7	N	Y	Y	Y	Y	Y	Y	Y
8	N	N	N	N	Y	Y	Y	Y
9	Y	N	Y	Y	Y	Y	Y	Y
10	Y	N	Y	Y	N	N	Y	Y

	#1	#2	#1	#2	#1	#2	#1	#2
AGE	18		18		18		18	
M/F	F		F		F		F	
INCOME	Less than $20,000		Less than $20,000		Less than $20,000		$20,000-35,000	
1	N	N	N	N	Y	Y	Y	Y
2	N	N	N	N	Y	Y	Y	Y
3	Y	Y	Y	Y	Y	Y	Y	Y
4	N	Y	N	N	N	N	Y	N
5	N	N	N	Y	Y	Y	N	Y
6	N	N	N	N	Y	Y	N	Y
7	Y	Y	Y	Y	Y	Y	N	N
8	N	Y	Y	Y	Y	Y	N	N
9	N	Y	Y	Y	Y	Y	N	Y
10	N	N	Y	Y	Y	Y	Y	Y

	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2
AGE	18		18		18		18		18	
M/F	M		M		M		M		M	
INCOME	Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000		$20,000-35,000	
1	Y	Y	N	N	Y	Y	Y	Y	N	N
2	Y	Y	N	N	Y	Y	Y	Y	N	N
3	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
4	Y	Y	Y	N	Y	Y	Y	N	N	N
5	N	N	N	Y	N	N	N	Y	Y	Y
6	N	N	N	Y	Y	Y	N	N	N	N
7	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
8	Y	Y	N	N	Y	Y	Y	N	Y	N
9	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
10	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Survey Results: 20-29 Age Range

	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2
AGE	23		22		21		23		23	
M/F	F		F		F		F		F	
INCOME	Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000	
1	Y	Y	Y	Y	Y	Y	N	N	N	N
2	N	N	Y	Y	Y	Y	N	N	N	N
3	N	N	Y	Y	Y	Y	Y	Y	Y	Y
4	Y	Y	N	N	Y	Y	Y	Y	Y	Y
5	N	N	Y	Y	N	N	N	N	N	N
6	N	Y	N	N	N	N	N	N	Y	Y
7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	Y	N	N	Y	Y	Y	Y	Y	Y	N
9	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
10	N	Y	Y	Y	Y	Y	Y	Y	Y	Y

	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2
AGE	24		22		23		26		24	
M/F	F		F		F		F		F	
INCOME	Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000	
1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4	N	N	Y	N	Y	Y	Y	Y	Y	Y
5	Y	Y	N	N	N	N	N	N	N	N
6	Y	N	Y	N	Y	N	N	N	N	N
7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	Y	Y	Y	N	Y	Y	N	Y	N	N
9	Y	N	Y	Y	Y	Y	Y	N	Y	Y
10	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2
AGE	23		22		23		26		21	
M/F	F		F		F		F		F	
INCOME	Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000	
1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2	N	N	Y	Y	Y	Y	Y	Y	Y	Y
3	N	N	Y	Y	Y	Y	Y	Y	Y	Y
4	N	N	Y	Y	Y	Y	Y	Y	N	N

Survey Results: 20-29 Age Range (continued)

5	Y	Y	N	N	N	N	N	N	Y	Y
6	N	N	Y	Y	N	N	Y	N	N	N
7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	Y	Y	Y	Y	N	N	Y	N	Y	Y
9	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
10	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
	#1	**#2**	**#1**	**#2**	**#1**	**#2**	**#1**	**#2**	**#1**	**#2**
AGE	23		21		20		22		22	
M/F	F		F		F		F		F	
INCOME	Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000	
1	Y	Y	N	N	Y	Y	Y	Y	Y	Y
2	N	N	N	N	N	N	Y	Y	Y	Y
3	N	N	N	N	Y	Y	Y	Y	Y	Y
4	N	N	Y	Y	Y	Y	Y	N	N	Y
5	Y	Y	N	N	N	N	N	N	Y	N
6	N	N	N	N	Y	N	N	N	N	N
7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	N	N	Y	Y	Y	Y	Y	Y	Y	Y
9	Y	Y	N	N	Y	Y	Y	Y	N	N
10	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

	#1	**#2**	**#1**	**#2**	**#1**	**#2**	**#1**	**#2**	**#1**	**#2**
AGE	27		24		22		21		22	
M/F	F		F		F		F		F	
INCOME	Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000		$20,000-35,000	
1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4	N	N	Y	Y	Y	Y	N	N	Y	Y
5	N	N	N	N	N	N	Y	Y	N	N
6	N	N	N	N	N	N	N	N	N	N
7	Y	Y	Y	Y	Y	Y	N	N	Y	Y
8	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
9	Y	Y	Y	Y	Y	Y	N	Y	Y	Y
10	Y	Y	Y	Y	Y	Y	N	Y	Y	Y

	#1	**#2**	**#1**	**#2**	**#1**	**#2**	**#1**	**#2**	**#1**	**#2**
AGE	23		26		25		25		27	
M/F	F		F		F		F		F	
INCOME	$20,000-35,000		$20,000-35,000		$20,000-35,000		$20,000-35,000		$20,000-35,000	

Survey Results: 20-29 Age Range (continued)

1	N	N	Y	Y	N	N	Y	Y	Y	Y
2	N	N	Y	Y	N	N	Y	Y	Y	Y
3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4	N	N	Y	Y	Y	Y	Y	Y	N	N
5	N	N	N	N	N	N	N	N	N	N
6	N	N	N	N	Y	Y	Y	N	N	N
7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	Y	Y	Y	Y	Y	N	Y	Y	N	N
9	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
10	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

	#1	**#2**	**#1**	**#2**	**#1**	**#2**	**#1**	**#2**	**#1**	**#2**
AGE	26		27		29		28		25	
M/F	F		F		F		F		F	
INCOME	$20,000-35,000		$20,000-35,000		$20,000-35,000		$20,000-35,000		$20,000-35,000	
1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4	N	N	N	Y	N	N	Y	Y	Y	Y
5	Y	Y	N	N	N	Y	N	N	N	N
6	Y	N	N	N	N	N	Y	Y	Y	N
7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	Y	N	Y	Y	N	N	Y	Y	N	Y
9	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
10	Y	Y	N	Y	Y	Y	Y	Y	Y	Y

	#1	**#2**	**#1**	**#2**	**#1**	**#2**	**#1**	**#2**	**#1**	**#2**
AGE	25		25		29		25		25	
M/F	F		F		F		F		F	
INCOME	$20,000-35,000		$20,000-35,000		$35,000-50,000		$35,000-50,000		$35,000-50,000	
1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2	Y	Y	Y	Y	N	N	Y	Y	Y	Y
3	Y	Y	Y	Y	N	N	Y	Y	Y	Y
4	Y	Y	Y	Y	N	N	Y	Y	Y	Y
5	N	N	N	N	N	Y	N	N	N	N
6	N	N	Y	Y	N	N	N	N	Y	Y
7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	Y	Y	N	Y	Y	N	N	N	N	N
9	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
10	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Survey Results: 20-29 Age Range (continued)

	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2
AGE	25		27		27		24		28	
M/F	F		F		F		F		F	
INCOME	$35,000-50,000		$35,000-50,000		$35,000-50,000		$35,000-50,000		$35,000-50,000	
1	Y	Y	Y	Y	Y	Y	N	N	Y	Y
2	N	N	Y	Y	Y	Y	N	N	Y	Y
3	N	N	Y	Y	Y	Y	Y	Y	Y	Y
4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5	N	N	N	N	N	N	N	N	N	N
6	N	N	N	N	Y	Y	Y	Y	Y	Y
7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
9	Y	Y	Y	Y	N	N	Y	Y	N	N
10	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2
AGE	26		29		26		25		25	
M/F	F		F		F		F		F	
INCOME	$35,000-50,000		$35,000-50,000		$50,000-70,000		$50,000-70,000		$50,000-70,000	
1	Y	Y	Y	Y	Y	Y	N	N	Y	Y
2	Y	Y	Y	Y	Y	Y	N	N	Y	Y
3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5	N	N	N	N	N	N	N	N	N	N
6	Y	Y	N	N	N	Y	Y	Y	N	N
7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	N	N	Y	Y	N	N	Y	Y	Y	Y
9	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
10	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

	#1	#2	#1	#2	#1	#2
AGE	24		24		25	
M/F	F		F		F	
INCOME	$50,000-70,000		$50,000-70,000		$50,000-70,000	
1	Y	Y	N	N	N	N
2	Y	Y	N	N	N	N
3	Y	Y	Y	Y	Y	Y
4	N	N	N	N	N	N
5	N	N	N	N	Y	Y
6	N	N	N	N	N	N
7	Y	Y	Y	Y	Y	Y

8	Y	N	Y	N	Y	Y				
9	Y	Y	N	Y	Y	Y				
10	Y	Y	Y	Y	Y	Y				

	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2
AGE	22		25		21		22		23	
M/F	M		M		M		M		M	
INCOME	Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000	
1	N	N	Y	Y	Y	Y	Y	Y	N	N
2	N	N	Y	Y	Y	Y	Y	Y	N	N
3	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4	Y	Y	Y	Y	N	N	Y	Y	N	N
5	N	N	N	N	N	N	N	N	N	N
6	N	N	Y	Y	N	N	Y	Y	N	N
7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
9	Y	Y	Y	Y	N	N	Y	Y	N	N
10	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2
AGE	21		25		24		24		26	
M/F	M		M		M		M		M	
INCOME	Less than $20,000		Less than $20,000		Less than $20,000		Less than $20,000		$20,000-35,000	
1	N	N	N	N	Y	Y	Y	Y	Y	Y
2	N	N	N	N	Y	Y	Y	Y	N	N
3	Y	Y	Y	Y	Y	Y	Y	Y	N	N
4	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
5	N	N	N	N	N	N	N	N	N	N
6	Y	Y	N	N	Y	Y	N	N	N	Y
7	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
8	Y	Y	N	Y	Y	Y	Y	Y	N	Y
9	Y	Y	Y	Y	Y	Y	Y	Y	N	Y
10	Y	Y	Y	Y	Y	Y	Y	Y	N	Y

	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2
AGE	25		25		24		25		27	
M/F	M		M		M		M		M	
INCOME	$20,000-35,000		$20,000-35,000		$20,000-35,000		$20,000-35,000		$20,000-35,000	
1	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
2	N	N	Y	Y	Y	Y	Y	Y	Y	Y

Survey Results: 20-29 Age Range (continued)

3	N	N	Y	Y	Y	Y	Y	Y	Y	Y		
4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
5	N	N	N	N	N	N	N	N	N	N		
6	N	N	Y	Y	Y	N	N	N	N	N		
7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
8	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
9	Y	Y	N	N	Y	Y	Y	Y	Y	Y		
10	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		

	#1	#2	#1	#2
AGE	26		24	
M/F	M		M	
INCOME	$35,000-50,000		$35,000-50,000	
1	N	N	N	N
2	N	N	Y	Y
3	Y	Y	Y	Y
4	N	N	Y	N
5	N	Y	N	N
6	N	N	Y	Y
7	Y	Y	Y	Y
8	Y	Y	Y	Y
9	Y	Y	Y	Y
10	Y	Y	Y	Y

Survey Results: 30-39 Age Range

	#1	#2	#1	#2	#1	#2	#1	#2	#1	#2
AGE	35		38		30		30		30	
M/F	F		F		F		F		F	
INCOME	Less than $20,000		$35,000-50,000		$35,000-50,000		$35,000-50,000		$35,000-50,000	
1	Y	Y	Y	Y	Y	Y	Y	Y	N	N
2	Y	Y	N	N	Y	Y	Y	Y	N	N
3	Y	Y	N	N	Y	Y	Y	Y	Y	Y
4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
5	N	N	N	N	Y	N	N	Y	N	N
6	Y	Y	N	N	Y	Y	N	N	N	N
7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
8	Y	Y	Y	Y	N	Y	N	N	Y	N
9	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
10	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y

Survey Results: 30-39 Age Range (continued)

	#1	#2	#1	#2	#1	#2	#1	#2
AGE	38		35		35		30	
M/F	F		F		F		F	
INCOME	$50,000-70,000		$50,000-70,000		$70,000-100,000		Over $100,000	
1	N	N	Y	Y	Y	Y	Y	Y
2	N	N	Y	Y	Y	Y	Y	Y
3	Y	Y	Y	Y	Y	Y	Y	Y
4	Y	Y	Y	Y	Y	Y	Y	Y
5	N	N	N	N	N	Y	N	N
6	N	N	Y	N	Y	Y	Y	Y
7	Y	Y	Y	Y	Y	Y	Y	Y
8	Y	Y	N	Y	Y	Y	Y	Y
9	Y	Y	Y	Y	Y	Y	Y	Y
10	Y	Y	Y	Y	Y	Y	Y	Y

	#1	#2	#1	#2	#1	#2	#1	#2
AGE	32		31		37		35	
M/F	M		M		M		M	
INCOME	Less than $20,000		$35,000-50,000		$70,000-100,000		$70,000-100,000	
1	Y	Y	Y	Y	N	N	Y	Y
2	N	N	Y	Y	N	N	Y	Y
3	N	N	Y	Y	Y	Y	Y	Y
4	Y	Y	Y	Y	Y	Y	Y	Y
5	N	N	N	N	N	N	N	N
6	N	N	N	N	N	N	N	N
7	Y	Y	Y	Y	Y	Y	Y	Y
8	Y	Y	Y	Y	Y	Y	Y	Y
9	Y	Y	Y	Y	Y	Y	Y	Y
10	Y	Y	Y	Y	Y	Y	Y	Y

Survey Results: 40-49 Age Range

	#1	#2	#1	#2	#1	#2
AGE	45		41		41	
M/F	F		F		F	
INCOME	$50,000-70,000		$50,000-70,000		$50,000-70,000	
1	Y	Y	Y	Y	Y	Y
2	Y	Y	N	N	Y	Y
3	Y	Y	N	N	Y	Y
4	Y	Y	Y	Y	Y	Y

Survey Results: 40-49 Age Range (continued)

5	N	N	N	N	N	N
6	N	N	N	N	Y	Y
7	Y	Y	Y	Y	Y	Y
8	Y	Y	Y	Y	N	N
9	Y	Y	Y	Y	Y	Y
10	Y	Y	Y	Y	Y	Y

	#1	#2
AGE	40	
M/F	M	
INCOME	$20,000-35,000	
1	N	N
2	N	N
3	Y	Y
4	Y	Y
5	N	N
6	Y	Y
7	Y	Y
8	N	N
9	Y	Y
10	Y	Y

Survey Results: 50-59 Age Range

	#1	#2	#1	#2	#1	#2	#1	#2
AGE	55		52		59		58	
M/F	F		F		F		F	
INCOME	Less than $20,000		$20,000-35,000		$35,000-50,000		$35,000-50,000	
1	Y	Y	Y	Y	Y	Y	Y	Y
2	Y	Y	Y	Y	Y	Y	N	N
3	Y	Y	Y	Y	Y	Y	N	N
4	N	N	N	Y	N	Y	N	N
5	N	N	Y	N	Y	N	N	N
6	Y	Y	Y	N	Y	N	Y	Y
7	Y	Y	Y	Y	Y	Y	Y	Y
8	N	N	N	Y	N	Y	N	N
9	Y	Y	Y	N	Y	Y	Y	Y
10	Y	Y	Y	Y	Y	Y	Y	Y

Survey Results: 50-59 Age Range (continued)

	#1	#2
AGE	51	
M/F	M	
INCOME	Less than $20,000	
1	Y	Y
2	Y	Y
3	Y	Y
4	Y	Y
5	N	N
6	Y	Y
7	Y	Y
8	Y	Y
9	Y	Y
10	Y	Y

Survey Results: 60-69 Age Range

	#1	#2
AGE	60	
M/F	M	
INCOME	$35,000-50,000	
1	Y	Y
2	Y	Y
3	Y	Y
4	Y	N
5	N	N
6	N	N
7	Y	Y
8	Y	Y
9	Y	Y
10	Y	N

Survey Results: 70-79 Age Range

	#1	#2
AGE	72	
M/F	F	
INCOME	$35,000-50,000	
1	N	N
2	N	N
3	Y	Y

Survey Results: 70-79 Age Range (continued)

4	N	N
5	Y	Y
6	N	N
7	Y	Y
8	Y	Y
9	Y	Y
10	Y	Y

Appendix C: Descriptive Statistics

Descriptive Statistics

The overall statistics from each age group category were gathered in Microsoft Excel to determine the mean average, standard deviation from the norm, and a 95% confidence level in reference to the percentage of participants that answered yes for each survey question. For the first survey, number 1 had a mean of 69.83 and a standard deviation of 34.12. The 95% confidence level was 31.55. Regarding number 2, the mean was 55.99, with a standard deviation of 32.54. The 95% confidence level was 30.09. Concerning number 3, there was a mean of 86.77 and a standard deviation of 10. The 95% confidence level was 9.25. Number 4 had a mean of 62.26, with a standard deviation of 41.36. The 95% confidence level was 38.26. As for number 5, the mean was 28.3, and the standard deviation was 35.65. The 95% confidence level was 32.97. Number 6 had a mean of 35.2 and a standard deviation of 34.44. There was a 95% confidence level of 31.85. Regarding number 7, there was a mean of 96.61, with a standard deviation of 7.75. The 95% confidence level was 7.17. Concerning number 8, the mean was 67.93, and the standard deviation was 29.42. The 95% confidence level was 27.2. As for number 9, the mean was 93.59, with a standard deviation of 11.63. The 95% confidence level was 10.75. Lastly, number 10 had a mean of 96.21 and a standard deviation of 7.8. The 95% confidence level was established at 7.21.

In terms of the second survey, number 1 had a mean of 69.83 and a standard deviation of 34.12. The 95% confidence level was 31.55. Regarding number 2, the mean was 56.2, with a standard deviation of 32.63. The 95% confidence level was 30.18. Concerning number 3, there was a mean of 86.17 and a standard deviation of 10.63. The 95% confidence level was 9.83. Number 4 had a mean of 51.9, with a standard deviation of 42.33. The 95% confidence level

was 39.15. As for number 5, the mean was 27.66, and the standard deviation was 38.81. The 95% confidence level was 35.89. Number 6 had a mean of 28.96 and a standard deviation of 22.75. There was a 95% confidence level of 21.04. Regarding number 7, there was a mean of 98.01, with a standard deviation of 4.67. The 95% confidence level was 4.31. Concerning number 8, the mean was 76.1, and the standard deviation was 19.43. The 95% confidence level was 17.97. As for number 9, the mean was 91.9, with a standard deviation of 10.16. The 95% confidence level was 9.4. Lastly, number 10 had a mean of 82.74 and a standard deviation of 37.3. The 95% confidence level was established at 34.5.

In order to perform a side by side comparison of the mean average, standard deviation from the norm, and the 95% confidence level, Table 11 displays each question for Survey 1 and Survey 2 group together.

Table 11

Descriptive Statistics

	Mean	Standard Deviation	95% Confidence Level
Survey 1, 1	69.83	34.12	31.55
Survey 2, 1	69.83	34.12	31.55
Survey 1, 2	55.99	32.54	30.09
Survey 2, 2	56.20	32.63	30.18
Survey 1, 3	86.77	10.00	9.25
Survey 2, 3	86.17	10.63	9.83
Survey 1, 4	62.26	41.36	38.26

Table 11 (continued)

Survey 2, 4	51.90	42.34	39.15
Survey 1, 5	28.30	35.65	32.97
Survey 2, 5	27.66	38.81	35.89
Survey 1, 6	35.20	34.44	31.85
Survey 2, 6	28.96	22.75	21.04
Survey 1, 7	96.61	7.75	7.17
Survey 2, 7	98.01	4.67	4.31
Survey 1, 8	67.93	29.42	27.20
Survey 2, 8	76.10	19.43	17.97
Survey 1, 9	93.59	11.63	10.75
Survey 2, 9	91.90	10.16	9.40
Survey 1, 10	96.21	7.80	7.21
Survey 2, 10	82.74	37.30	34.50

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