Global Journal of Business Research
Vol. 11, No. 3, 2017, pp. 27-37
ISSN: 1931-0277 (print)
ISSN: 2157-0191 (online)

IBFR
www.theIBFR.com

PUBLIC KNOWLEDGE OF GENETICALLY MODIFIED ORGANISMS IN FOOD AND THE IMPACT ON BUSINESSES: EVIDENCE FROM THE U.S.

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ABSTRACT

This study explores the public's knowledge on Genetically Modified Organisms, or GMOs, in the daily foods we consume. A survey was utilized to collect a random sample. This survey is designed to measure the participant's knowledge on GMOs and the participant's diet and lifestyle. Our hypothesis is that individuals who exhibit knowledge of GMOs will have better diets and lifestyle habits. These individuals will be more likely to avoid foods with GMOs by opting for healthier alternatives, such as organic foods and fresh produce. Additionally, individuals who are less knowledge of GMOs will portray more unhealthy habits in their lifestyles. Our expectation is that the group less knowledgeable about GMO's will be more likely to purchase foods containing GMOs. By gaining a better understanding of the connection between knowledge and lifestyle choices, or lack thereof, we can learn more about how one's knowledge of GMOs affects his/her lifestyle and purchasing habits.

JEL: Q18

KEYWORDS: Genetically Modified Organisms, Lifestyle Habits

INTRODUCTION

The myriad risks of consuming GMOs, or genetically modified organisms, are becoming more widely known and discussed. "GMOs are organisms whose genetic make-ups have been changed by mutating, inserting, or deleting genes, by using genetic engineering techniques or biotechnology" (Klein, Wolf, Wu, & Sanford, 1987; as cited in Goldbas, 2014, p. 20). GMOs are considered threatening to the environment and human health, and these two topics seem to be the most emphasized and studied when discussing GMOs and their potential risks. There are various health concerns associated with the consumption of GMOs, and some of the specific issues that may stem from the consumption of GMOs include: food allergies, increased toxicity, decreased nutritional value, and antibiotic resistance (GMO: Harmful Effects, n.d.). Studies have been conducted on animals to try to better understand the damaging effects that GMOs may pose to humans. Animals in the study exhibited multiple problems, including accelerated aging, organ damage, immune and gastrointestinal system disorders, and infertility (Smith, 2011). Studies on humans supported the notion that GMOs have potential long-term effects due to residual material from the GMOs being left in the body (Smith, 2011). After the introduction of GMOs into the market in 1996, associated health problems rose drastically (Bawa & Anilakumar, 2012). Since that time, the percentage of chronic illnesses among humans has greatly increased, disorders such as, autism and digestive problems have also increased, and food allergies have become more common. (Smith, 2011). The term "genetically modified foods" otherwise known as GMFs, indicates that the food includes or was

derived from a genetically modified organism (Ardekani, 2014). Proper labeling of foods may help consumers better understand how the foods they consume affect their allergies (Landrigan & Benbrook, 2015). The AAEM group, also known as the "American Academy of Emergency Medicine," urges individuals to educate themselves about GMOs, and it encourages individuals to opt for a diet that excludes GMOs (Smith, 2011). As a result, the American Academy of Environmental Medicine, otherwise known as the "AAEM," has pushed doctors to encourage their patients to opt for non-GMO diets (Smith, 2011).

The purpose of this study is to determine if there is a correlation between knowledge of GMOs and exhibiting a healthy lifestyle. Our hypothesis is that individuals who are knowledgeable about GMOs are more likely to embrace healthy lifestyle habits. Furthermore, those who are not knowledgeable about GMOs are more likely to exhibit unhealthy lifestyle habits. This study will discuss label reading and its impact on lifestyle choices, and the effect that GMOs have on both human health and the environment.

LITERATURE REVIEW

Individuals who are motivated to lead a healthy lifestyle are likely to monitor the foods they purchase by reading labels on foods. Individuals who read and understand the ingredients listed on labels helps to ensure that the food they consume is healthy. In 2016, President Barack Obama signed a bill that would require companies to conform to a certain standard of accurately labeling foods that contain GMOs. Food labels will benefit consumers who are attempting to make well-informed choices. Furthermore, food that is labeled properly will provide vital information for those trying to understand the development of new food allergies (Landrigan et al., 2015). One study that emphasized reading food labels claimed, "The primary roles of food labels are to inform consumers about nutrition, help them compare the nutrients in similar products and choose the one that best suit their needs, as well as helping them to make healthy food choices" (Darkwa, 2014, p. 13). Although manufacturers supply an ingredients list for foods, not all individuals know how to properly read an ingredients label. With all of the ingredients added to foods, many of them with bizarre names, it can be difficult to comprehend what ingredients are safe, and which might be potentially harmful. A valid point that deserves consideration is that individuals might not be making healthy choices because they lack the knowledge necessary to understand what ingredients are healthy and what ingredients to avoid. While individuals may monitor the labels on the foods they purchase, that does not necessarily mean that they are knowledgeable about the ingredients. Darkwa's study about knowledge pertaining to food labels claims, "...it is worth deliberating consumers' knowledge of this information, and their willingness to read, understand and use the information as a guide when making decisions about what food to buy" (Darkwa, 2014, p. 13). While some individuals review the ingredients list before purchasing the item, there is evidence to support the idea that many do not even review the ingredients list (DeVille-Almond & Halliwell, 2014).

Not only do the consumers have to worry about understanding the ingredients in a particular item, but vibrant packaging, often used to attract the viewer's attention, has misleading phrases emblazoned on the front. Phrases such as "Low-Calorie," "Excellent Source of Fiber," or "Reduced Sodium," catch the consumer's attention, even though these claims do not always correspond with one another. For example, the word 'natural' has become an issue, and there are a variety of lawsuits against food companies who utilize this phrase on packaging for their food. "From a food science perspective, it is difficult to define a food product that is 'natural' because the food has probably been processed and is no longer the product of the earth" (Gerald & Dorothy, 2015, p. 4).

According to naturalsociety.com not all "NON-GMO" labels mean that it is indeed GMO-free. Unless the label is verified by a reliable source there is a high chance that the product being purchased has GMOs in it. An article on jonrappoport.wordpress.com reported that Whole Foods was sued for false labeling products as "NON-GMO."

The plaintiff's claim was that, "Whole Foods advertised and sold Blue Diamond Almond Breeze Almond Milk and Vanilla Almond Milk with non-GMO labels, when these products had not been verified as such by the Non-GMO Project" (Rappoport, 2014, para. 1). Trying to remain GMO- free, from a consumer's point of view, could pose difficult if the labels on the food cannot be trusted. In order to ensure one is avoiding foods with GMOs, they should make sure that the labels are verified by a legitimate source for non-GMO foods. Until there are proper labels on foods or GMOs are banned, it is important to learn the effects of GMOs in order to ensure that one is protecting himself/herself and his/her family (Gucciardi, 2012).

One of the best ways to ensure the avoidance of foods containing GMOs would be to adhere to a strictly organic diet. While that certainly is not ideal for most consumers due to the high prices of organic foods, it is definitely one of the easiest ways to avoid foods containing GMOs. "On produce, the USDA organic seal verifies that irradiation, sewage sludge, synthetic fertilizers, prohibited pesticides and genetically modified organisms (GMOs) were not used" (Gerald & Dorothy, 2015, p. 4). Opting for organic foods with the USDA organic seal is the most foolproof way of avoiding foods containing harmful GMOs.

The top foods that one should avoid when trying to live a GMO-free lifestyle includes: corn, soy, sugar, papayas, aspartame, canola, zucchini, yellow squash, dairy, and cotton in the form of oil. Other foods that one should avoid are canned soups, frozen foods, cereal, grain fed meats, and soft drinks. The bulk of processed foods tend to contain GMOs. Fresh fruits and vegetables are usually safe to eat, with some minor exceptions:

> *"The only GM produce you're likely to find is the Hawaiian papaya, a small amount of zucchini and squash, and some sweet corn. No meat, fish, and poultry products approved for direct human consumption are bioengineered at this point, though most of the feed for livestock and fish is derived from GM corn, alfalfa, and other biotech grains. Only organic varieties of these animal products are guaranteed GMO-free feed" (Caldwell, 2013, para. 4).*

Beans, nuts, and seeds are also great to eat when leading a GMO free lifestyle. When possible purchase organic items, as these items are the safest way to be sure they are not genetically modified.

The bottom line is, "It's up to consumers to decide which type of food they want to buy, and to register their opinion on GMO foods the simplest way... with the power of their purchases. Sooner or later, companies will want to provide the products that people are buying the most" (Erdosh, 2014, p. 14). If individuals become more aware of the side-effects said to be associated with GMOs and refuse to purchase foods containing GMOs, then the demand for items containing GMOs will decrease and stores might be less likely to stock products containing GMOs.

The key to making wise choices at the grocery store involves the consumer educating himself/herself about ingredients and their meanings. Reading the labels on foods, comprehending what potential health complications the ingredients may cause, and avoiding misleading text on packaging all play a role in making educated decisions. Individuals who are monitoring varying foods' labels in the grocery store, while paying attention to the foods they are consuming indicates that the individual cares about what harmful ingredients they may be putting in their bodies. The main reason someone would inspect the label on foods is to ensure that the ingredients are somewhat healthy.

Label Reading and Lifestyle Choices

Our study argues that understanding labels should portray a positive correlation, that is, as one variable increases (knowledge about GMOs), the other variable will also increase (healthy lifestyle habits). A

healthy lifestyle is defined as "orientation toward the prevention of health problems, and the maximization of personal well-being" (Kempen, Muller, Symington, & Van Eeden, 2012, p. 15). Individuals are also more likely to read food labels if they are on a low-fat diet, as opposed to those who have high-fat diets (Svederberg, Gustafsson, Reuterswärd, & Svensson, 2008). There is evidence to support that lifestyle habits are correlated with a multitude of other variables. "USA consumers, who followed a healthy lifestyle, were found to average a higher consumption of fruit and vegetables, were largely female, had a higher level of education, and were predominantly older than consumers who adhered to an unhealthy lifestyle" (Kempen et al., 2012, p. 15). This data our claim that individuals who avoid GMOs in their foods do so intentionally because they have educated themselves on the topic and are striving to lead a healthy lifestyle. Individuals known to have diets mainly comprised of fruits and vegetables, both known to be low in GMOs, tend to lead healthy lifestyles (Caldwell, 2013).

GMO inside has been trying to push to get all products to show on their labels if GMO is included in the product. Many individuals do not realize that many of the common beverages that we drink contain a high amount of GMO, some of which include Pepsi (or any type of soda), Tropicana juices, Simply juices, Hi-C, and Kool Aid. Producers of these items would rather not disclose the GMO information on their product label due to the risk of decrease in sales of the product resulting in a loss of sales for the company. People do not realize that the detailed labeling of GMOs on products in the United States is not mandatory:

> *"GMO Inside is also calling attention to the fact that Coca-Cola and Pepsi have spent more than $4.1 million to derail GMO labeling in the US. There are now more than 60 countries that require GMO labeling; however the US is not one of them. Last fall, voters in California went to the polls to try to become the first state to allow for the statewide labeling of GMO ingredients. Despite growing consumer demand for labeling and popular public support for this proposition, Prop 37 was defeated, due to millions of dollars spent by major food and chemical companies. PepsiCo contributed $2,485,400 against Prop 37 and Coca-Cola spent $1,700,500" (Newswire, 2013, p. 3).*

Therefore, regardless of what the label states the product may still contain GMOs. This can make it difficult for consumers to make informed and healthy decisions when purchasing food. However, Internet research on the topic may help individuals gain a better understanding of certain foods that are usually known to contain high amounts of GMOs. Some foods that are said to be extremely high in GMOs are: processed foods, soda, and frozen foods. Again, it is best for the consumer to stick to a diet containing fresh fruits, vegetables, and organic foods. The compilation of research supports the notion that individuals who monitor food labels to ensure they are making wise and healthy decisions about the food they consume tend to be educated about harmful ingredients such as GMOs.

GMO and the Effects It Has on the Environment

Many of us do not realize the harmful effects that GMOs not only have on our bodies, but also in the environment. Throughout the world there are thousands of farmers that rely on their crops for their income. Depending on the farmer, some crops are being sprayed with different types of chemicals to speed up the growth of the crops. "In 2017, you'll be able to purchase genetically modified apples that won't turn brown when cut open" (Benson, 2015, p. 18-21). Will this intrigue consumers to purchase these apples that are filled with chemicals or will it make them realize that this is not natural and cannot be safe for our bodies? Many of us do not take the time to look at the effects it could have but rather focus on the convenience of the product.

GMOs are becoming a growing issue to deal with, especially since GMOs are extremely common in the United States. Many crops that include GMOs, such as: soy, corn, cotton, and canola are grown in the United States. Other countries have banned GMOs, while the United States does not even ensure proper labeling of foods containing GMOs. "USA still tops the list of number of approved GM events followed

by Japan, Canada, Mexico, South Korea, Australia, the Philippines, New Zealand, the European Union, and Taiwan" (Broeders, De Keersmaecker, & Roosens, 2012, p. 1). As of now, only two states, Connecticut and Maine, have passed GMO labeling laws, while Vermont's labeling laws will go into effect in 2016 (Trager, 2014). "Following numerous other states in the US, a poll has found the majority population in Ohio don't like genetically engineered foods, and 87% of them want foods containing GMO ingredients to be labeled" (Barrett, 2015, para. 1).

GMOs are also negatively affecting other living organisms. Many argue that GMOs are toxic to other living organisms, such as butterflies, birds, and bees:

> *"Bees are hugely important in the pollination of many food crops, but are unfortunately extremely endangered by modern agricultural techniques, such as GM crops. Monarch butterflies are specifically at risk from GMO maize plants. In addition to bees and butterflies, birds are also at risk from pesticides, and work as biological control agents and pollinators, again, like bees" (Glass, 2013, para. 3).*

Furthermore, since GMOs are known to be resistant to certain agricultural techniques, GMOs may prove difficult to eradicate GMOs from agriculture, which means that it can create a considerable ecological shift.

This evidence supports the notion that GMOs are not only harmful to humans, but they also negatively impact the environment. With toxicity on the rise and the increase in deaths of certain organisms, GMOs are undoubtedly harming the environment. Therefore, GMOs need to be monitored, and the United States needs to embrace stricter labeling laws.

DATA AND METHODOLOGY

This study's participant pool was acquired via Facebook and email solicitation. The participants of our survey were ages twenty-one and older. Of our total seventy-seven participants, one individual chose not to disclose his/her gender. Our sample was predominately female respondents with a total of fifty-four female participants. Twenty-two men made up the other portion of our sample.

This study was conducted in October 2015, and the survey was available to the public for a total of nine days. The participants were asked a total of fifteen questions prodding participants to analyze their personal level of knowledge about GMOs and their habits of reading or ignoring food labels. Then, participants were asked about their lifestyle habits including questions about whether they exhibited sedentary or active lifestyles, sleeping patterns, and eating and drinking habits, among others.

We utilized an online delivery of our survey to collect a random sample of people in Ohio. The survey was provided through an online survey website called Zoho. Participants who chose to take the survey were given a brief introduction to the survey to help participants understand what their participation would entail. Participants were told that their responses would remain completely anonymous, and that they could opt out of the survey at any time. There was no incentive for this study. Participants did not have a time frame to answer the questions, and they could do so at their own leisure.

Participants were asked to answer questions about gender and age. Questions were presented in a close-ended format, and an "other" box was available to those who did not feel comfortable answering the questions about gender and age. The demographic questions were presented at the end of the survey, and they were utilized merely to gain a better understanding of the audience who took the survey.

The researchers created the questions for this survey, and a five-point Likert-type response scale was utilized to enable easy interpretation for the recorded results. After participants completed the 15 questions about knowledge of GMOs and lifestyle choices, they were presented with the two demographic questions.

RESULTS

Genetically Modified Organisms and Lifestyle Habits

Our survey had a total of seventy-seven participants who completed the entire survey. As table 1 illustrates, of the 28 respondents who opted for the neutral option of "neither agree nor disagree" about being knowledgeable about GMOs in foods. Twenty-three (29%) of the total participants surveyed claimed to be neutral about understanding the side effects of GMOs. As table one illustrates, thirty-five participants (45%) claim that they do not inspect the labels on foods to see if the foods contain GMOs. This is important to note, as reading labels on foods provides vital information to the consumer about GMOs and ingredients that would be avoided by those pursuing a healthy lifestyle, such as sugars, sodium, and saturated fats. Fourteen respondents claim to be very knowledgeable about GMOs in foods, nine claim to be very aware of the side effects associated with GMOs, yet, only four individuals claimed to inspect the labels on their foods for the purpose of avoiding GMOs.

Table 1: Survey Responses

Question	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I am knowledgeable about GMOs in foods	10	13	28	12	14
I am aware of the side effects of GMOs	12	20	23	13	9
I inspect the labels on my foods to see if they contain GMOs	35	18	12	7	4
I am aware of the impact GMOs have on the environment	17	21	16	10	12
I often opt for soda as my non-alcoholic beverage of choice	45	10	9	8	5
I often purchase organic foods	18	21	20	13	4
I avoid frozen foods in the grocery store	24	22	13	11	4
I often purchase fresh produce in my grocery store	0	6	11	20	40
I closely monitor the foods I purchase and consume	6	12	30	18	11
I exercise for at least 30 minutes a day (3-5 times per week)	16	19	11	12	19
I usually get a healthy amount of sleep per night (minimum seven hours)	9	9	8	35	16

This table portrays how many respondents answered for each category (strongly disagree to strongly agree) out of the total seventy-seven participants acquired for survey questions 1-11.

As noted in table 1, more than half of the participants, forty (51%) claimed that they "strongly agree" to purchasing fresh produce in the grocery store. Fresh produce is typically safe to consume and is mostly considered non-GMO. On the contrary, twenty-four participants (31%) claimed that they do not avoid frozen foods in the grocery store, and unlike fresh produce, they are known to be extremely high in GMOs. Organic foods are not the choice of a vast majority, probably due to the expensive prices associated with organic foods. Forty-five participants (58%) "strongly disagree" that soda, which are known to be high in GMOs, is their first choice of non-alcoholic beverage.

Nearly half of the participants get a minimum of seven hours of sleep per night, which is considered a to be a healthy and adequate amount of sleep. The amount of participants who exercise at least thirty minutes a day three to five times a week is roughly half of the participants who took the survey. Individuals embracing a healthy lifestyle should be cognizant of the health benefits associated with exercise, and along

with receiving adequate amounts of sleep, are incorporated in the habits of those trying to live a healthy life. When the survey statements became more specific in regards to GMOs, the majority of the answers were neutral. Unfortunately, this survey has "fence-sitters," or people who are more inclined to opt for the neutral option, neither strongly agree nor strongly disagree. For example, when participants were asked if they know what GMOs are, the neutral option had the most respondents at twenty-eight. There was more of an unbiased result when asked if people monitor the foods they purchase and consume.

As Table 2 illustrates below, of the seventy-seven total participants, 70 (90%) do not smoke and 62 (80%) do not binge drink alcohol. Although individuals may not relate smoking to GMOs, medical research has made the public aware that smoking has a myriad of negative effects on the body. Individuals who claim to know more about GMOs and choose to omit GMOs from their diets are conscious of their health choices, and that should reflect in other personal lifestyle habits, too, such as not smoking, avoiding large consumption of alcohol, and getting regular exercise and sleep.

Table 2: Survey Responses

Responses	**Yes**	**No**
I currently smoke cigarettes	6	70
I tend to binge drink alcoholic beverages	14	62
	Male	Female
I am:	22	53
What is your age group?	Responses	
21-24	27	
25-28	10	
29-32	10	
33-36	6	
37-40	8	
41 or older	14	

Table 2 portrays the collected responses from participants regarding more personal lifestyle habits, gender, and age to grasp a better overall understanding of the participants surveyed.

The gender and ages of the participants were collected to better understand the data in relation to the participant pool. Some participants opted out of sharing these answers due to the personal nature of the questions. Of the seventy-five individuals who chose to share their age group, 27 (36%) were aged twenty-one to twenty-four years old. Of the seventy-fived who shared their gender, 53 (70%) were females, while 22 (29%) were males.

Rationale and Hypothesis

Individuals who lead healthy lifestyles are more likely to be knowledgeable about GMOs, which might indicate that these individuals take the time to inform themselves about harmful ingredients in foods. If individuals are knowledgeable about harmful ingredients, then they are more likely to monitor the foods they purchase and consume. Individuals may read food labels to follow dietary restrictions due to allergies, but some may be reviewing the label to ensure that the food they eat is healthy and nutritious. There is evidence to support the notion that label reading and lifestyle choices coincide with one another, since individuals who are concerned with the ingredients in the foods they eat are more likely to carry those health concerns into other aspects of their lives, such as getting a sufficient amount of sleep and exercise.

It is predicted that the habit of inspecting food labels to avoid harmful ingredients, such as GMOs, will be positively correlated with the individual's concern to make healthy lifestyle choices. A positive correlation means that as one variable increases (avoiding GMOs), then the other variable will also increase (healthy lifestyle choices). Individuals who inspect food labels to avoid GMOs or other harmful ingredients are more likely to monitor other decisions that may negatively impact their health, such as smoking, drinking, or not receiving an adequate amount of sleep of exercise.

CONCLUSION

Our study was created to understand the relationship, or lack thereof, between knowledge of GMOs and lifestyle choices. The hypothesis for our study was supported indicating that individuals who are more knowledgeable about GMOs tend to lead healthier lifestyles in general. Those who claim to be more knowledgeable about GMOs tend to be more conscientious of reading food labels, eating organic foods, leading active lifestyles, and exhibiting healthy sleeping patterns.

The data collected for our study was measured using the Likert scale for easy data interpretation. While this method provides an easy and straightforward way to analyze and interpret the collected data, one big drawback of the Likert scale is that participants are likely to exhibit "fence-sitting," which means that participants often opt for the middle or neutral response, as to not strongly agree nor disagree.

One beneficial thing to note for future studies on the topic would be to more closely monitor extraneous variables. One extraneous variable not accounted for in our study is that some individuals who are inspecting the labels on their foods might be merely inspecting the labels because they have some type of allergy. Avoiding certain foods due to an allergy does not necessarily signify that the individual cares about his/her health. Avoiding certain ingredients because of an allergy is different than avoiding an ingredient because one is trying to live an overall healthy lifestyle. As stated in this study:

> *"Consumers may use nutrition labels for different reasons. Some may use the nutrition information to aid in the consumption of more healthful foods and overall chronic disease prevention, whereas others may have chronic diseases and have been advised by their doctors to follow certain nutrition or dietary guidelines" (Lichtenstein, Appel, Brands, Carnethon, Daniels, Franch, & Wylie-Rosett, 2006, para. 6).*

This notion was also supported by another study claiming, "It has also been shown that consumers with a health problem that lead to dietary restrictions are more likely to use nutritional information on labels while shopping than those without such a problem" (Bender and Derby, 1992; Nayga et al., 1998; as cited in Svederberg, Gustafsson, Reuterswärd, & Svensson, L., 2008, p. 193). Therefore, it is important to consider that some individuals might be reading labels to avoid ingredients that may have to be avoided for allergies or other health complications. Another thing to consider is that some individuals might be reading the labels of foods to avoid other ingredients, while not worrying about the GMOs in a particular item. This was another extraneous variable that should have been accounted for when creating the survey.

Another suggestion to consider when doing a survey about GMOs is to present a demographic question about the level of one's education. As previously discussed, there has been evidence to support that females who have a higher education tend to be more educated on GMOs than others (Kempen et al., 2012). Adding this demographic question to the survey will allow the researcher to better understand his/her sample.

Time may be a factor for working individuals with families with regards to having the time to not only have the knowledge but to apply what they know while they are shopping for their meals. When families have parents that both work and have multiple children involved in sports in the evenings after school, it can get difficult to have the time to prepare meals. Many fall on the convenience factor of buying frozen meals or

ordering carry out from a local restaurant to save the time in order to relax before starting the hectic day all over again the following day. Time may be a big factor, but lack of money could also be a factor that individuals have to consider when shopping for their foods at the grocery store. The unhealthy garbage foods tend to be much cheaper than the lean meats, organic foods, or foods that do not contain GMO's. Individuals that may not have the additional money to pay for the healthier foods may decide to eat what they can afford and exercise or involve themselves in a recreational sport to offset the not so healthy food that they are eating. Adding a salary range to the survey could be beneficial when reviewing the results to compare if individuals with knowledge about GMO's that make a certain range of salary value their health enough to spend the money.

With the ever-growing research and questions that arise about GMOs, there is always more research that is needed to better understand GMOs and the effect on humans and the environment. One suggestion for future research is to ask specific questions about GMOs to analyze whether or not the individual is knowledgeable. Our participants were asked to self-analyze their knowledge on the topic, as well as their lifestyle habits. This type of survey relies on the participants to analyze themselves, which means that individuals may have embellished or downplayed their knowledge on GMOs and whether or not their daily habits were healthy or not. By asking specific questions, as opposed to having them make general observations about themselves, this research could be taken a step further and improved upon.

Furthermore, future research can be done to incorporate another variable, such as asking the participants if they avoid other harmful ingredients in foods, such as high fructose corn syrup and soybean oil (which is known to contain GMOs). By asking the participant if they avoid other harmful ingredients, it allows for a more in-depth study on the overall lifestyle of the participant. As previously discussed, reading food labels is an important part of leading a healthy lifestyle, but not all food labels accurately label its contents. GMOs, in particular, are not always labeled on foods in the United States.

APPENDIX

Survey

The survey employed a numbered scale for eleven of the questions. The scale ranged from 1 through 5, with 1 labeled Disagree and 5 labeled Agree. Three of the questions allowed a Yes, No, or Prefer not to answer response. The final question allowed selection of the respondent's age range from 21-24 years old, 25-28, 29-32, 33-36, 37-40, and 41 years or older.

For the purposes of data analysis, the numbered responses were understood as 1 equal to strongly disagree, 2 equal to somewhat disagree, 3 equal to neither disagree nor agree, 4 equal to somewhat agree, and 5 equal to strongly agree.

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ACKNOWLEDGEMENTS

Jaclyn and her team would like to sincerely thank Dr. Arburn for his unwavering support, encouragement, and guidance during this endeavor. We would also like to thank The University of Findlay, which provided us with the means to get our paper published.

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