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The Effects of a Vegetarian Diet

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Abstract

The purpose of this paper is to equip individuals with knowledge of the effects of a vegetarian diet. This paper will provide factual research for a group of individuals willing to investigate how certain dietary choices can provide benefits for current and future generations in all aspects of life. The consumption of a vegetarian diet impacts a person's health, the environment, the economy, and society. This concept is examined through the idea of nutrition ecology. Exploring concepts related to these four components will provide insight into the food consumption choices that people make while also understanding the effect it may play. Many individuals choose to consume a vegetarian diet for health reasons, such as weight loss, cholesterol issues or diabetes. Other individuals choose to eat a vegetarian diet for animal welfare reasons or environmental issues, such as sustainability concerns. Whatever the decision-making factor may be, the effects of a vegetarian diet possess positive outcomes for the individual, the environment, the economy, and society while maintaining an ecological balance.

The Effects of a Vegetarian Diet

A vegetarian diet is meal plan comprised of foods primarily from plant sources. Foods include fruits, vegetables, legumes, whole grains, nuts, seeds and possibly dairy products. Depending on the type of vegetarian diet a person may associate themselves with, depends on the foods they choose to eat. Vegetarianism has been documented since the 1600s, but increased awareness became more prominent when a food movement emerged in the 1960s that dealt with issues of the environment and food producers. The subject of the plant-based diet came into the spotlight again in 2010 when the European Parliament enforced a legislation ruling that companies cannot mark food labels as vegan when they contain animal products, or utilize the use of animal aid to process or manufacture the food. Since then, vegetarian diets have become a hot topic among people. Vegetarian diets become popular when an individual chooses to get healthy, whether it be for weight loss or a health diagnosis. But there are some people that choose to consume a vegetarian diet based on other choices, such as animal welfare or environmental concerns. Whatever the decision-making factor may be, the effects of a vegetarian diet possess positive outcomes for the individual, the environment, the economy and society.

The purpose of this paper is to explore the impact of a vegetarian diet on personal health, the environment, the economy, and society. Even though vegetarian diets can be difficult to maintain and therefore become fad diets rather than lifestyle changes, a vegetarian diet is beneficial to personal health and the environment. Vegetarian diets present personal health benefits for individuals, while supporting the environment. Consuming a vegetarian diet encourages the skillset of preparing and cooking wholesome and nutritious foods, being an

educational learning tool for future generations, and preserving our natural resources, while also protecting the welfare of animals.

Nutrition Ecology

A vegetarian diet offers benefits that will be addressed through the idea of nutrition ecology. Nutrition ecology is a scientific approach that utilizes aspects of the nutrition system. “Nutrition ecology involves all components of the food chain, including production, harvesting, preservation, storage, transport, processing, packaging, trade, distribution, preparation, composition, and consumption of food, as well as disposal of waste materials” (Leitzmann, 2003, p. 657S).

Nutrition ecology (health, environment, economy, and society) relies heavily on the idea of sustainability, defined as the “development that fulfills current global needs without diminishing the possibility of future generations to meet their own needs” (Leitzmann, 2003 p. 657S). Sustainability allows people the opportunity to maintain the overall well-being of the world and its natural resources on a long-term scale. Sustainability also relates to food through fair distribution as well as ecological perspectives (Leitzmann, 2003). Nutrition incorporates all aspects of life (Lihoreau et al., 2015). According to research, vegetarian diets have lasting benefits on all four components within the nutrition ecology spectrum. The scientific approach of nutrition ecology identifies issues utilizing a vegetarian diet for nutritional and health related reasons, as well as environmental concerns, economy and society (Metz & Hoffman, 2010). Exploring the ideas of nutrition ecology will provide insight to the effects of a vegetarian diet.

Each aspect of nutrition ecology is taken into account equally (Metz & Hoffman, 2010). The idea of nutrition ecology encompasses all aspects of nutrition from the production of the food, the processing, retail, transportation, food consumption and the disposal management (Metz & Hoffman, 2010). These components often contribute to a person's decision making factors when adopting a vegetarian lifestyle. Health is one of the first aspects that people look at when deciding to become a vegetarian. Common health reasons are weight, cholesterol and high blood pressure. Secondly, environmental factors also play a strong role in becoming a vegetarian. Food production affects the environment based upon the agriculture method used (Leitzmann, 2003). "Research shows that vegetarian diets are well suited to protect the environment, to reduce pollution, and to minimize global climate changes" (Leitzmann, 2003, p. 657S). The economy plays a role in the nutrition system on a universal scale by pushing the financial position of countries. Many countries can grow certain foods and therefore a price is determined by location, employee wages, transportation, importation and exportation of food items. Lastly, contributing to the global effect of nutrition ecology is society. Society incorporates certain conditions in which food is processed, such as shopping for food items and preparation of meals. Many people value the time spent cooking with family members or friends and enjoying a home cooked meal, while also knowing the origin of their food. Society as a whole is affected not only on a local level, but a global level, as well.

Definitions

Vegetarian diets are personal diet choices that individuals choose to consume. There are different types of diets associated with vegetarianism. Becoming familiar with these groups gives people a better understanding of the identity of a vegetarian diet. These groups are:

- Omnivore group: people that eat a mixed diet consisting of animals and plants.
- Vegans: diet contains no animal products, including products that use animals to create, harvest, prepare or profit from human consumption.
- Lact-Ovo vegetarians: diet contains no meat, poultry or fish but does consume eggs and dairy products.
- Lacto vegetarians: does not consume meat, poultry, fish or eggs but does eat dairy products.
- Partial vegetarian: does not eat meat but may consume fish (pescatarian or pesco-vegetarian) or poultry (pollo-vegetarian).
- Plant-based: diet consisting foods derived from plants; vegetables, whole grains, legumes, fruits (Tuso, Ismail, Ha, & Bartolotto, 2013).

Health

Health is a primary concern for many people. Personal diets play a large role in the overall health of individuals. Understanding how these problems can be brought on by poor diet choice will provide valuable insight to common conditions, such as obesity, measured by body mass index (BMI), diabetes, hypertension and heart disease, which can be brought on by cholesterol. These common ailments can be linked together by diet. For example, poor diet choices can lead to higher BMI's which can affect sugar levels and potentially cause Type 2 diabetes. Continuing with a diet high in fats can cause cholesterol issues that can result in heart disease and hypertension. Positive results from past research provides the basis for the effects of health when consuming a vegetarian diet. A statement released by the Academy of Nutrition and Dietetics, formerly known as American Dietetic Association, stated:

Vegetarian diets are often associated with a number of health advantages, including lower blood cholesterol levels, lower risk of heart disease, lower blood pressure levels, and lower risk of hypertension and Type 2 diabetes. Vegetarians tend to have a lower body mass index (BMI) and lower overall cancer rates. Vegetarian diets tend to be lower in saturated fat and cholesterol and have higher levels of dietary fiber, magnesium and potassium, Vitamins C and E, folate, carotenoids, flavonoids, and other phytochemicals. These nutritional differences may explain some of the health advantages of those following of those following a varied, balanced vegetarian diet. (Craig & Mangels, 2009 p. 1267)

Phytochemicals are active compounds found in plants. The phytochemicals work with the human body to promote health and fight diseases. Phytochemicals cannot be found in animals or animal products. Common names for these compounds are flavonoids, carotenoids and glucosinolates. These compounds work to provide benefits to the human body. Examples include anti-inflammatory agents, growth inhibitor of cancer cells, support of a stronger immune system and antioxidants that work to protect against diseases. A review conducted by Ian T. Johnson at the Institute of Food Research provided research that showed diets containing high amounts of fruits and vegetables provided protective properties against cancer (Johnson, 2007). The study explained that phytochemicals metabolize and act as a protective barrier, thus inhibiting the growth and development of cancer. Johnson asserts that diets containing large amounts of phytochemicals contain similar traits as drugs used for chemoprevention (Johnson, 2007). The United States Department of Agriculture (USDA) asserts that antioxidant rich foods, such as green, leafy vegetables are shown to be beneficial at cancer-prevention (Yan, 2016). Other evidence supports the findings that phytochemicals found within whole plant foods work

to support the overall functions of the gastrointestinal, cardiovascular and immune systems. Phytochemicals are found in large quantities of plant based foods and contain antioxidants that work to protect the human body by providing anti-inflammatory properties that improve the overall function of blood vessels (Craig & Mangels, 2009).

Body Mass Index (BMI)

Body mass index, or BMI, is the way in which body fat is measured based on the ratio of height and weight. The ratio given will provide a calculated number that determines the body fat percentage of an individual. Consuming a plant-based diet has been effective at lowering BMI (Tuso et al., 2013). Plant-based foods have a high-water content, thus causing a person to feel fuller longer. Plant-based foods are low in calories and high in fiber content, also giving the effect of feeling full. The intake of a plant based diet provides nutrients that sustain the health and overall function of the body and the fiber within the vegetables and fruits keeps the digestive track healthy. Sugar and sodium are other additives that are found in non-plant based diets. These additives provide longer shelf life as well as better tasting flavors. The sodium within these foods can cause bloating while the artificial sugars add to the weight gain. Weight is often associated with body shape. BMI measurements will give a starting reference point for calculating overall health. Taking body measurements will also help stay on top of health where the BMI measurements may fall short. Where BMI shows body fat based on height and weight, body shape can show physical characteristics of one's health. A lower BMI will dictate body shape.

Studies have shown that vegetarians are thinner than nonvegetarians (Key, Davey, & Appleby, 1999). A study that included 60,812 individuals and was conducted from 2002-2006

showed that vegans had lower BMI's compared to nonvegetarians (Tonstad, Butler, Yan, & Fraser, 2009). Per the study, when animal products are eaten, the BMI will increase. According to The Oxford Vegetarian study, a lower BMI among vegetarians can be directly related to the high dietary fiber content within the plant based diet and a lower intake of animal products (Key et al., 1999). The reported data gathered from this research was based upon meat eaters (omnivore), fish eaters (pesco-vegetarian), vegetarians (lacto-ovo vegetarian, lacto vegetarian, ovo vegetarian) and vegans. This is considerable since many studies provide research solely on vegetarians and non-vegetarians. A study conducted in 1994 found that both men and women who consumed meat had a higher BMI than vegans and vegetarians (Key & Davey, 1996). The data suggest that a meat free diet is associated with a low prevalence of obesity (Marsh, Zeuschner, & Saunders, 2012). *The American Journal of Clinical Nutrition* published an article that stated, "A plant-based diet is inversely related to body mass index (BMI), overweight and obesity" (Newby, Tucker, & Wolk, 2005, p.1267). A data review team reported in *Nutrition Reviews* found that individuals consuming nonvegetarian diets burned fewer calories compared to those that consumed a vegetarian diet. Furthermore, vegetarians have lower rates of high blood pressure, diabetes, obesity and heart disease (Tuso et al., 2013). The difference of the BMI between vegans and non-vegetarians indicates the potential of vegetarianism to protect against obesity. Further evidence showed that when animal products were introduced into the diet, an increase in BMI became evident.

Cholesterol

Cholesterol is a fatty substance found within the cells of the human body. Cholesterol is needed to produce hormones that allow the body to properly digest foods. Although the body

needs cholesterol in order to produce hormones, a properly functioning body already produces enough cholesterol (Hever, 2016). Cholesterol is also found in animal products, such as meat, cheese and eggs. HDL (high density lipoprotein) and LDL (low density lipoprotein) cholesterol are noted to be good and bad, respectively. The HDL cholesterol works to push cholesterol through the body and back to the liver. The LDL cholesterol, known as the bad cholesterol, builds up in the arteries (Camero, 2017). In turn, this creates high blood cholesterol. Consuming animal products has the ability to raise cholesterol levels, causing coronary heart disease which can cause a blockage within the heart valve and cause a heart attack, leading to serious complications or death. Mortality rates and cholesterol have both been demonstrated to be lower among vegetarians than non-vegetarians. “The benefit of plant-based diets on mortality may be primarily caused by decreased consumption of red meat (Tuso et al., 2013, p. 63).

Approximately 6000 vegetarians and 5000 non-vegetarians participated in the Oxford Vegetarian Study, which provided data that suggested cholesterol totals were higher among meat eaters than vegans and vegetarians. The diets used within this study were divided into four groups, vegans, vegetarians, fish eaters, and meat eaters. The comparison of cholesterol totals as well as LDL-cholesterol showed overall cholesterol totals were much lower within the vegetarian group and significantly higher among meat eaters. The results of the study after the follow-up indicated that heart disease was also lower in vegetarians than meat eaters (Appleby, Thorogood, Mann, & Key, 1999). This is partly because of soluble fiber, which is found in beans, apples, berries, and bran (Mayo Clinic, 2015). Soluble fiber has also been demonstrated to lower cholesterol levels as well as reduce the risk of heart disease (Craig & Mangels, 2009; Bazzano, 2008). Overall evidence supports that vegetarians have lower cholesterol levels than nonvegetarians (Craig &

Mangels, 2009). The data concluded that the health of vegetarians correlates positively compared to nonvegetarians.

Hypertension

Hypertension is defined as abnormally high blood pressure and is caused by diet and stress-related factors. Blood pressure levels that rise above 180/120 are considered severe, and can lead to heart disease or stroke. Hypertension has been linked to the consumption of red meat within a diet (Kaluza, Åkesson, & Wolk, 2014). Increasing the intake of fruits and vegetables have been shown to reduce blood pressure levels, thus lowering the risk of hypertension (Reddy & Kattan, 2004). Multiple studies have shown that vegetarians and vegans have lower levels of hypertension and blood pressure than nonvegetarians. Berkow & Barnard (2005) found certain cultures, including Pacific Islands, rural Asia, New Guinea, and parts of Africa, consume a primarily plant-based diet. The individuals living within these areas had lower levels of blood pressure. When the same individuals moved to industrialized areas where meat was the primary diet source, their blood pressures increased and the onset of hypertension became present. The Dietary Guidelines Advisory Committee found that individuals consuming a vegetarian diet had lower blood pressure levels compared to nonvegetarians (Tuso et al., 2013).

Saturated fats, Trans fats and sodium have all been linked to the increase of hypertension. The American Heart Association's daily recommendation for a heart-healthy diet states that no more than 6% of calories should come from saturated fats. Animal products added to a diet can increase the overall totals. The EPIC-Oxford and California Seventh-Day Adventist cohort studies were two large studies that suggested that death from heart disease was lower among vegetarians than nonvegetarians (Appleby, Davey, & Key, 2002; Fraser, 1999). Both cases

support that lacto-ovo vegetarians as well as vegans had a lower risk of death from hypertension. According to researchers at the Cancer Research Center in the UK, vegetarians have a lower occurrence of hypertension, as well as overall lower blood pressure levels than meat eaters (Appleby, Davey, & Key, 2002). The National Health and Nutrition Exam Survey (NHANES) released survey results that were taken in 1999 to 2000. The results found that nearly 30% of adults in America have prehypertension or hypertension (Wang & Wang, 2004). Other data suggests that the risk of acquiring hypertension is growing. Simple dietary changes can help alleviate many of the symptoms that hypertension presents. According to the American Heart Association, “weight is directly associated with BP (blood pressure)” (Appel et al., 2006, p. 297). Studies indicate that blood pressure rises as the intake of sodium chloride (dietary salt) increases (Appel et al., 2006). Other clinical trials have shown reducing the intake of sodium can prevent hypertension and lower blood pressure (Appel et al., 2006). Numerous studies have confirmed that the overall blood pressure levels are significantly lower among vegetarians than nonvegetarians. The overwhelming support drawn from past research studies continues to show that a diet rich in fruits and vegetables not only accounts for lower blood pressure levels, but it may also be a means of treating or preventing the onset of hypertension. Sufficient evidence continues to find that a strong dietary regimen will have lasting benefits on the human body.

Diabetes

The issue that plagued Robert Kluttz was his cholesterol and a diagnosis of type 2 diabetes. Kluttz was treated by a Louisville, Kentucky practitioner who placed him on a vegan diet, which led to an 83-pound weight loss, normal blood sugar levels, stopping the use of

prescription medications, disappearance of vertigo, and his cholesterol tests showed that his arteries were clearing up. The reasoning for his declining health is described as follows:

The science behind it reveals this: within hours of eating a cheeseburger, gelatinous fat – like bacon grease that sits too long on a cold stove – floats in the blood stream. So cells lining the blood vessels become sticky to attract the fat so white blood cells can gobble up the invaders. As the white blood cells destroy fat, they release enzymes that can damage and inflame blood vessels. That inflammation makes it harder to process sugar (Downs, 2016, pp. 1D, 8D).

Plant based diets that are low in fat and contain little or no meat have been shown to prevent and treat diabetes (Tuso et al., 2013). Research studies have shown that approximately 43% of individuals consuming a low-fat vegan diet were able to reduce their medications (Tuso et al., 2013). The Adventist Health Study-2 also found that vegetarians had a lower risk of type 2 diabetes than nonvegetarians (Tonstad, et al., 2009). Further research confirms that individuals consuming processed and red meat had an increased risk of diabetes (Tonstad, et al., 2009). The willingness to switch to a vegetarian diet could protect against the risk of type 2 diabetes.

Overall, evidence supports that a diverse, plant-based diets carries significant health benefits (Tuso et al, 2013). Healthy weight, lower blood pressure levels, healthy appearance, and increased energy are just a few of benefits that come with consuming a vegetarian diet. In addition, plant-based diets are cost-effective, low-risk interventions that will provide lasting benefits for weight loss, cholesterol, and blood pressure as well as many other positive outcomes. Fruits, vegetables, legumes and whole grains have a lower caloric density but provide a higher nutrient density (Corry & Wendel, 2011). Plant based foods provide all the necessary

components needed for the human body to properly survive. This is the basic claim made by the film, *Forks Over Knives*. They observed several individuals with health problems and placed them on a vegetarian diet, monitoring their progress on a weekly basis. A plant-based diet allows the body to absorb vitamins and nutrients that provide lasting benefits in the prevention and treatment of many of today's common problems.

Dietary Concerns

Understandably, many people are concerned with potential nutritional deficiencies when eating a vegetarian diet. All whole foods contain all three macronutrients. Macronutrients are carbohydrates, protein and fat. Eating a diet that has good carbohydrates, low fat, and moderate protein will support human health (Craig & Mangels, 2009). The only nutrients not found within plants are Vitamin D, which can be obtained from the sun's rays or by taking a Vitamin D supplement, and Vitamin B12. Vitamin B12 is found most commonly in eggs and dairy products. The body needs vitamin B12 to prevent anemia, stomach problems, and neurological disorders. Another common concern for people is protein deficiency. Protein requirements can be met through the intake of a variation of plant food sources (Craig & Mangels, 2009). Complete proteins, such as poultry, fish, casein (milk), cheese, eggs, and quinoa are proteins that contain all nine essential amino acids. An incomplete protein lacks one or more of the essential amino acids. Complementary proteins consist of two incomplete proteins that when eaten together, make a complete protein (Guzman, 2011). Adding beans and grains to a diet can provide an excellent source of protein, as well as provide an adequate source of iron. Balancing the plant-based diet is key. There are many vegetables that provide an abundance of minerals. These minerals work together to ensure adequate care for the human body. Feeding the human

body sources of leafy greens, root vegetables, berries, nuts, seeds, legumes, and grains, ensures that the body is receiving the proper minerals and nutrients it needs to sustain a healthy lifestyle, while also providing balance to the diet.

Research provides evidence that supports plant-based diets work to protect, heal, grow and support vital organs. The American Diabetic Association believes that vegetarian diets are healthful, nutritionally adequate, beneficial in the prevention and treatment of some diseases, and are appropriate for all life-stages of individuals (Craig & Mangels, 2009). By providing physicians with sufficient evidence on the positive effects of plant-based diets and strong nutrition plans, common health risks such as obesity, cholesterol, hypertension, and diabetes can become practical solutions.

Environment

Human health is affected by the environment in which a person lives. Research shows that individuals living among air polluted cities have more respiratory related diseases than those that live outside of urban populations (Brunekreef & Holgate, 2002). Human health is impacted by environmental issues, such as air pollution, foods laced with pesticides and fertilizers, and food packaging. Energy use, land use, water use, pesticides, fertilizers, pollution, and livestock are several components of the environment considered when discussing nutrition ecology (Metz & Hoffman, 2010). The effects of the environment from food production has lasting consequences on land and water use. The environment is modified based on human activity and with the advancement of technologies for animal farm use, damaging effects on the environment are becoming more evident (Aneja, Schlesinger, & Erisman, 2008; Leitzmann, 2003). Air pollution, deforestation, soil erosion, and water quality are threatening future generations while

deforestation and pesticide use is causing harm to natural habitats for animals and insects. An example of this would be the honey bee habitat. Honey bees play a critical and necessary component in the pollination of plants, including crops; the collapse of honey bee colonies has been linked to increased pesticide use (Henry et al., 2012).

In recent years, the demand for meat has over-doubled. With the ability to produce meat on a large scale operation, the interest and supply for meat production is expected to double once again. Past research shows that the world's total meat supply has doubled in the last 46 years and continues to grow (Bittman, 2008). The United Nation's Food and Agriculture Organization has estimated that livestock production occupies approximately 30% of the earth's land and produces a fifth of the world's greenhouse gases (Bittman, 2008). With the environment at stake, a knowledge of the effects of a vegetarian diet can become a vital asset for future generations.

Studies have shown that plant-based diets have less of an environmental impact than diets that include meat or animal products (Carlsson-Kanyama & Gonzalez, 2009). Implications from animal food production include, but are not limited to, greenhouse gases, fertilizers and pesticides, soil erosion, and irrigation practices. The effects of consuming a vegetarian diet can work to support the environment and individuals by incorporating and sustaining more organic farming techniques, while also making produce markets more readily available and inexpensive to small communities.

Greenhouse Gases

Carbon dioxide, methane and nitrous oxide are greenhouse gases (GHGs) that are emitted during the storage, transportation and processing of foods. Agriculture is a main contributor to the production of methane and nitrous oxide. These gases warm the atmosphere thus contributing to climate change. According to past studies, dietary choices and the consumption of certain foods have an effect on the environment based on the energy needs used during the process of growing, harvesting and transporting foods (Carlsson-Kanyama, 1998). Agriculture has several factors that are related to the emissions of greenhouse gases when certain practices are applied. Applying fertilizers leads to the emissions of nitrous oxide. Nitrous oxide emissions account for over half of the total emissions excreted for agriculture related purposes (EPA, 2017). “Nitrous oxide is the single greatest ozone-depleting substance” (Ravishankara, Daniel, & Portmann, 2009). “Approximately 74% of the total nitrous oxide emissions from agriculture are due to nitrogen fertilization of cropland, which supports production of both animal and plant based foods” (Eshel & Martin, 2006, p. 9). Methane gas is produced from livestock when digestion occurs, flooded rice fields, the storage of animal manure, and during the production and transportation of natural gas, oil, and coal. Methane emissions also result from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills. When oxygen is limited, organic materials degenerate and cause methane to be produced (Carlsson-Kanyama & Gonzalez, 2009). Products linked to methane gas emissions are meat, dairy and rice. In order to maintain supply and demand for the production of animal protein, approximately 9 billion livestock are needed for the United States alone (Pimental & Pimental, 2003). Methane accounts for nearly one-third of greenhouse gas emissions produced from agriculture (EPA, 2017). Carbon dioxide is released into the atmosphere by solid waste and the

burning of natural gas, oil, and coal. Animal waste, a byproduct of livestock production, produced an estimated 60,700,000 tons of carbon dioxide (Esther & Martin, 2006, p. 9). The total estimation of carbon dioxide emitted in 2003 was 172,200,000 tons produced from methane gas, directly related to livestock (Eshel & Martin, 2006, p. 9). Depending on the quality and the quantity of the feed is dependent upon the amount of methane produced.

These greenhouse gases are small in comparison to the GHGs emitted during the transportation process. Agriculture accounts for 9% of greenhouse gases whereas transportation accounts for 26% of GHG emissions (EPA, 2017). Hydrofluorocarbon (HFC) is a greenhouse gas emitted with refrigeration transport. Transportation of food consumes fossil fuels, which is linked to carbon dioxide emissions (Eshel & Martin, 2006). Studies have shown that plant based foods including legumes, vegetables, and cereals produce lower amounts of greenhouse gases than animal food products. Greenhouse gases produced for meat consumption produce the highest amount of greenhouse gases (Carlsson-Kanyama & González, 2009, p. 1206S). Studies show that one and a half tons more of carbon dioxide is released into the atmosphere from eating a meat based diet than a vegetarian diet (Pluhar, 2010). Previous research shows that a plant-based diet could alleviate many of the emissions of greenhouse gases (Horrigan, Lawrence, & Walker, 2002). Other studies confirm that intact forests remove carbon dioxide (greenhouse gas) from the atmosphere (Tilman, Cassman, Matson, Naylor, & Polasky, 2002). Incorporating foods that derive from plant sources while also substituting or eliminating meat based products could alleviate a substantial amount of the output of greenhouse gases as well as having a positive influence on other sectors of the environment.

Fertilizers and Pesticides

Water is a renewable resource, but water quality is determined by rainfall amounts, evaporation rates, temperature, and runoff factors (Pimental, Huang, Cordova, & Pimentel, 1997). According to the Environmental Protection Agency (EPA), “agriculture in the United States contributes to nearly three-quarters of all water-quality problems in the nation’s rivers and streams” (Bittman, 2008, p. 2). The dependence of fertilizers and pesticides can wreak havoc on the streams, creeks and rivers, as well as bird and insect species. The pollution of water sources is caused from fertilizers, pesticides and soil sediments (Pimental et al., 2010, p. 4). The use of fertilizers and pesticides can cause ‘dead zones’ in waterways, or an absence of oxygen present in the water. This effect can kill marine life and drive other marine life, fish and shrimp, out of their habitats. The use of nitrogen released from fertilizers and animal wastes has proven to leach into the air, and attach to leaves and barks on trees (Hoodaji, Ataabadi, & Najafi, 2012; Moffat, 1998). Although, plants can take nitrogen in through their roots, they cannot take in nitrogen through their leaves, stems, and trunks, effectively. This causes plant species to become vulnerable to pests and other growth problems. In turn, the excessive fertilizer reduces plant diversity.

The application of pesticides targeted to reach pests and insects is a very small percentage. Aerial application of pesticides targets roughly 50% of the crop (Pimental & Burgess, 2012). “It has been estimated that only 0.1% of applied pesticides reach target pests, leaving the bulk of the pesticides (99.90%) to impact the environment” (Horriagan et al., 2002, p. 446). The use of pesticides, direct or indirect, can have a negative impact on the insect populations, honeybee colonies, birds, amphibians, and oceanic marine life, such as, whales,

seals and dolphins (Margni, Rossier, Crettaz, & Jolliet, 2002). “Exposure to pesticides can weaken honeybees’ immune systems – making them more vulnerable to natural enemies such as mites” (Horrigan et al., 2002, p. 446). The use of pesticides on plants and insects can cause a resistance from the chemical on the species being targeted. The resistance to pesticides has increased to more than 500 insect species worldwide (Michigan State University, 2016). Further evidence supports the use of pesticides can not only destruct wildlife habitats, but also cause a diversification absence among flowers (Potts et al., 2010).

Soil Erosion

Soil erosion is a result of agriculture. It has been reported that the loss of fertile farmland for crop production has disappeared at a rapid rate (Pimentel, Huang, Cordova & Pimentel, 1997). Soil erosion prevents the ground from holding adequate water within the soil, which also depletes the soil from vital nutrients needed to produce vegetation. Soil erosion causes the productivity of the soil to decline (Pimental & Pimental, 2005). Poor soil productivity creates a growing concern. The cause of poor soil productivity can be caused by the lack of holding capacity of water within the soil, as well as the availability of nutrients and water needed to sustain plant life (Pimental et al., 2010). Research shows soil is being lost from land areas 10 to 40 times faster than the rate of soil renewal (Pimental, 2006). The rate it takes one centimeter of soil to form ranges from 20 to 1000 years (Sterner, 2017).

Land can become eroded by heavy grazing as it becomes compacted. This can strip the soil of plant growth, which is needed in order to hold the dirt in place. The continued overuse of the soil by means of growing grains, heavily grazing cattle or irrigation practices can cause desertification. Resulting in the degradation of land can affect the amount of agriculture

availability (Horrigan et al., 2002). Applying fertilizers to improve the soil becomes necessary in order to produce strong yields of crops, but it can also have consequences on other life-forms. The erosion of the soil causes pollutants to creep into waterways, rivers, streams and oceans. “Excess nitrogen in soil can lead to less diversity of plant species, as well as reduced production of biomass” (Horrigan et al., 2002, p. 446). The effects of soil erosion have a negative impact on plant-based diets by inhibiting growth and decreasing yields, which could cause an increase in price. The growth of forests and grasslands can reconstruct and rejuvenate lost nutrients within the soil, allowing it become fertile again (Tilman, Cassman, Matson, Naylor, & Polasky, 2002).

Irrigation

The use of irrigation to ensure proper plant growth and hydration of livestock has been a necessary practice for farming. Livestock production uses the majority of water from irrigation sources. The production of beef not only requires a lot of energy, but also a lot of water. For instance, underground aquifers are decreasing during drought seasons to ensure adequate irrigation use for agricultural practices. In some cases, underground aquifers are being depleted quicker than they can be replenished (Grogan, Wisser, Prusevich, Lammers, & Froelking, 2017). Salts that are left behind after irrigation can lessen the soils fertility and capacity holding rate. Salinization, which occurs naturally through mineralization, but can also have a drying effect in the soil, can be mistaken for dry soil and the use of irrigation can lead to waterlogging the soil. Although, ocean water has been viewed as a resource that could potentially be used in irrigation practices, the “desalinization of ocean water is not a viable source for freshwater needed by agriculture, because the process is energy intensive and, hence, economically impractical” (Pimental et al., 2010, p. 4). The ability to improve the efficiency of water use and agriculture is

possible with the help of individual dietary choices, such as the substitution of energy-intensive meats for fruits, vegetables, grains, beans, and nuts (Webber, 2011).

Sustainability

With the population of the world increasing at rapid rates, the question of whether or not we can sustain ourselves in an environmentally-friendly way by still producing enough food for everyone, becomes a very valuable question. Food production is a necessity for survival, but the process of the current food production is contributing harm to our environment. Greenhouse gases, whether by livestock, transportation, or other societal influences, are eroding our atmosphere. The production needs of food is contributing to 60%-70% of deforestation which is causing destruction and loss to the world's tropical rainforests, savannahs, grasslands and temperate forests (Pimental et al., 2010). Natural resources are being depleted to produce food as the world population increases. A growing concern is the imbalance between the resources that support humans and the increase in the world's population (Pimentel et al., 1997). Biodiversity is needed in order to produce an adequate supply of food. This includes fertile land, clean and fresh water, and renewable energy. A vegetarian diet incorporates many diversified foods.

The integrity of the ecosystem has suffered, but moving forward, strategies that focus on conservation techniques and proper consideration of management of natural resources are bringing forth a balance between food production, the economy, and the environment. Principles of sustainability rests on the idea that the present needs be met while still being able to accommodate the needs of future generations. The goal of sustainability for agriculture is the health of the environment, a profitable economy, and fairness for society (Horrigan et al., 2002).

These goals are met when individuals choose to consume a vegetarian diet. Plant-based foods support the environment by reducing the national carbon footprint and pollution, reducing deforestation and erosion of topsoil, conserving water, and protect wildlife habitats (Virtanen et al., 2011). More organic, sustainable farming practices grow quality foods while reducing inputs and creating economic profitability, while also attributing to the overall health and well-being of humans and animals. Sustainable methods for human use can start with choosing to consume a vegetarian diet.

Over the past 30 years, sustainable agriculture practices have been incorporated into conventional farming techniques for the purpose of preserving and maintaining the environment while also influencing the economy. Methods of sustainable agriculture include crop rotation, cover crops, no-till or low-till farming, soil management, diversity, nutrient management, integrated pest management, rotational grazing, and precision agriculture. Crop rotation provides better pest control without the high use of pesticides. Cover crops provide better soil quality while minimizing the effects of soil erosion. No-till or low-till farming methods prevents disturbance to the soil by retaining water, nutrients, and topsoil (Bharadwaj, 2016). Soil management entails properly managing the ecosystem of the soil by utilizing composting techniques and organic matter as fertilizers. Therefore, healthy plant growth becomes less susceptible to pests. Diversity involves growing a variety of crops that work to control pests while also providing habitats. Nutrient management ensures that applying only the necessary amount of fertilizer that can be absorbed in the soil can not only save money but also prevent the contamination of creeks and streams by preventing runoff. Integrated pest management utilizes pesticides as a last resort. Rotational grazing prevents soil erosion by moving livestock to other areas to graze, providing the soil to maintain a strong vegetative cover (Horriagan et al., 2002).

Lastly, precision agriculture uses technology to measure and observe changeability in crops with the goal of increasing profits and preserving natural resources (Hopkins, 2015; McBratney, Whelan, Ancev, & Bouma, 2005). The reliance on natural resources for conventional farming methods can result in higher levels of food contamination from the use of pesticides and fertilizers (Carlsson-Kanyama & González, 2009). By combining sustainable farming practices with modern farm technology, farmers can utilize continual agriculture techniques to make better use of the soil.

Farming methods and practices are improving, but personal choices from individuals must also become prevalent. Minimizing the consumption of processed meats and food products and partaking in a vegetarian diet can have positive, lasting effects on the environment. Small, daily changes made by one person can affect other individuals. The opportunity to make improvements for the environment should be a collective action among individuals. The effects of a vegetarian diet have strong and beneficial impacts on the environment. Sustainable farming practices benefits current and future generations. Growing in knowledge from the ideas presented provide a new way to become environmentally-friendly while still enjoying healthier food alternatives. The practices implemented for the benefit of environment can reduce water use and soil resources while also producing higher crop yields and providing economic benefits (Pimental & Pimental, 2005). The economy and the environment must work together to create balance for profit and sustainability purposes. The consumption of a vegetarian diet provides a correlation for the environment and the economy to balance out one another by growing and producing quality plant-based foods that have less inputs, creating a greater profit margin for the farmer.

Economy

With the idea of sustainability to benefit the environment comes the needs of the economy. Sustainability works to create balance for the environment and the economy by utilizing and incorporating technologies that will protect the environment while also creating a profitable economy. Maintenance of profits for farmers and lower energy use alternatives creates for a stronger economy for communities and nations. The balance of protecting natural resources while crop production yields maintain steady rates is the idea of sustainability for the economy (Feenstra, 2017). Continuation of pest management, soil conservation, water conservation, along with the implementation of new technologies that conserve resources, such as no-till farming practices and multi-cropping, and incorporating recyclable resources, such as waste and plant materials, and water harvesting, provide a more stable environment and a secure economy. Sustainable agriculture practices have been shown to be competitive with conventional farming methods while also being highly productive (Corselius, Wisniewski, & Ritchie, 2001; Rodale Institute, 2011).

As the environment continues to be affected by shortages of land, water, and energy sources, so does the idea that humans consume too much. Farms that are managed well and have adopted sustainable agriculture practices have shown to be profitable and have strong levels of productivity (Adamtey, 2016). Using sustainable agriculture techniques to reduce the use natural resources as well as create economic growth and meet supply and demand concerns is the overall goal for food related productions. Consumers can choose vegetarian options that create growth in certain sectors of the economy. Local produce sold at farmer's markets creates community involvement and profit for local farmers and shareholders.

Energy Use

The processing, packaging, and transportation of food requires a considerable amount of fuel consumption and energy use. Other factors can play a role in the amount of resources needed to produce, harvest, package, and transport food products, such as the energy and fuel needed to power production plants for poultry farms, dairy farms, and hog barns, as well as packaging facilities, from the use of lights, ventilation, heating and air units, feed, and water sources. The amount of energy used for the production of food was estimated to be 10% to 18% in 1999 (Heller & Keoleian, 2000). The use of fossil fuels in 2007 accounted for 13.9% derived from food production (Canning, Rehkamp, Waters, & Etemadnia, 2017). Furthermore, “a significant amount of energy is lost as livestock convert the grain they eat into meat” (Horrigan et al., 2002, p. 445). The grain fed to livestock, such as swine and poultry, can become more resource intensive than producing the grain for human consumption. The increased use of renewable and nonrenewable resources for food production is “occurring faster than the rate of regeneration” (Horrigan et al., 2002, p. 446). Research shows that the consumption of energy for agriculture related industries will continue to rise (Eshel & Martin, 2006). The dependency on oil, gas, and coal to harvest crops and maintain factory farming operations is declining energy sources at a rapid rate. With increasing population rates and the demand for more meat production, natural energy sources will be depleted before the end of the century (Pimental et al, 2010). The need for sustainable energy use should become an advancement for the benefit of the economy as well as the environment (Tilman, Cassman, Matson, Naylor, & Polasky, 2002).

Reports have shown that a vegetarian diet produces less energy than a meat based diet due to less transportation being used and industrial agriculture techniques being practiced. The

comparison of energy and protein from animal sources and plant sources revealed the cost of obtaining nutrients from plant sources was much cheaper than getting the same nutrients from animal sources, such as dairy or meat (Lusk & Norwood, 2009). Using the cheapest cost of meat, broiler chickens, carried a cost of five times more than using the most expensive plant food, peanuts (Lusk & Norwood, 2009). In addition, the cost of animal food source expenditures was higher when compared with plant sources, due to the cost of labor and processing costs. Protein production of beef, pork, and dairy are more expensive than plant food sources because of energy costs being utilized (Lusk & Norwood, 2009). Harvesting grain that is stored in feed houses constitutes a large amount of energy and expense while the cost of plant food sources is lower because of minimal packaging and less storage costs than animal products.

Economic Sustainability

With rising energy costs associated with harvesting, producing, and transporting animal products, sustainable agriculture practices need to be practiced while also providing teaching tools to individuals. Incorporating farmer's markets in rural communities allows for less energy consumption and an economic benefit to small farmers. Alternative livestock operations and small farms that produce food sources, possibly organic, provide strong economic benefits to rural communities. Research shows that the positive economic impact for communities was greater when using sustainable farming practices than with conventional farming techniques (University of Kentucky, 2012; Corselius et al., 2001). Alternative farming practices often include organic farming, which diminishes the use of pesticides and fertilizers, limits growth regulators for livestock production, and prohibits the use of genetically modified organisms (GMOs) for the production of food. Results from a large study revealed that organic farms

showed a net income profit that exceeded conventional farms (Crowder & Reganold, 2015). Organic farming methods produce food without the use of fertilizers and pesticides. The out-of-pocket expenses decrease while the non-use of fertilizers and pesticides protects the food source, and no-till farming works to prevent soil erosion. The profit margin can grow because of less out-of-pocket expense. Although, the idea that larger farms are more profitable because of their size and out-put, is not necessarily true. Past studies found that small farms were as economically efficient as large farms and as large farms grew in size, they became less efficient (Ikerd, 2006; Hallam, 1991). Large scale farming operations include labor-forces and when yields are high, profit is higher, and when yields are low the profit margin shrinks (Meyfroidt, 2017). Small farms producing organically grown produce have become increasingly abundant and beneficial to the local communities. As the demand for organic produce grows, the organic farming system increases. The reliance on smaller, rural organic farms to increase production for local communities increases as well. Rural farmer's markets, roadside stands, and u-pick patches support local economic growth (Ikerd, 2006). The increased biodiversity promoted by organic farming methods comes at a premium price. Consumers are becoming increasingly aware that organic produce contains fewer chemicals than produce grown conventionally. With prices higher on organic produce, more and more individuals are willing to pay for health and environmental needs as well as to support small local farmers. Organic farming prices have lower production costs and therefore the overall profit margin is higher. Although sustainable agriculture practices are one response to the protection of the environment, and an economic benefit, personal choices are also a potential positive response. A vegetarian diet is one of those choices. The choice to have a personal, positive effect on the economy and the environment can be done by consistently by choosing to consume a vegetarian diet.

Providing farmer's markets in rural communities that provide fresh, locally grown produce gives consumers an advantage. Knowing their food choice is healthy as well as economically beneficial is a strong balance between health and the economy. Providing teaching tools to members of communities, including school age children and adults on where food comes from is a valuable lesson that should be taught. Valuable tools and resources are available for large farmers and small farmers, organic farms and conventional farms. Tools such as soil testing that provides recommendations for specific amounts of fertilizers to administer based on the soil pH. Other resources include literature, spray guides, and home vegetable gardening books. The future of the sustainable farming practices lies in the hands of the younger generations. Creating programs that give children a desire to create a stronger community economically while protecting the environment and providing healthy food products is a need that will benefit future generations. Vegetarianism provides a plethora of healthy food products that are produced using sustainable methods, while also contributing to the positive outcomes of the economy and the environment. Society must work together to become more efficient with food production, while also becoming aware of the everyday choices individuals make that affect the world as a whole.

Society

The effects of a vegetarian diet in relation to society coincides with the purchasing of foods, meal preparations, lifestyle habits of food consumption, import and export of food products, and the social conditions for individuals. The economy is affected by the food choices people make while society creates the supply and demand for food production. The balance of the aspects of nutrition ecology, health, environment, economy and society, work individually as

well as collectively to create the dynamics that affect society overall. Society associates quality food resources and distribution with location and the economy (Raubenheimer, Simpson, & Mayntz, 2009). A sustainable nutrition system is created by taking into account the various types of foods that support the overall dynamics of nutrition ecology. A vegetarian diet supports the overall needs that make up nutrition ecology, while society is the factor that determines the demands of food (Leitzmann, 2003).

Influences

Patterns of behavior emerge from society based on specific needs from social groups. These needs stem from nutrition. Nutritional needs for society members is determined by frequency interactions among members of a group. Individuals have a nutritional state of mind, so to speak. They arrive at a decision from a consensus from other members of the social group (Lihoreau et al., 2015). Society uses its influence to fuel growth of ideas from one individual to the next. Modeled behavior as well as determination and consistency is a strong influence of encouragement. A vegetarian diet provides individuals the freedom to expand their knowledge and perception of nutrition beyond the table.

The idea that knowledge is power is true with a vegetarian diet. Providing lifelong educational tools that allow consumers to understand how to read nutrition labels and how to understand the overall effect certain foods have on the human body is a knowledge that could produce positive results. Teaching society how a vegetarian diet impacts personal health, the environment, and the economy provides a strong foundation that can benefit society as a whole. The effects of a vegetarian diet provide society with knowledge and skills that is gained through experience, skills such as food preparation, food budgeting, cooking, among other benefits.

Society grows from experiences, life lessons, and ideas that are passed down from one person to the next. Teaching the effects of a vegetarian diet can be influential for society.

Education, Occupation, and Income

Common indicators of society's food purchasing habits include education, occupation, and income (Turrell & Kavanagh, 2006). Education reflects one's common knowledge about healthy dietary options as well as understanding how to decipher food labels. Education regarding healthy food choices is gained through the public school system, health department, and the Extension Office, physician, and media outlets. Gained knowledge regarding healthy vegetarian options provides a better understanding of nutrient content and the benefits that derive with consuming a vegetarian diet. Occupation exposes society members to differing cultures that may provide outlets of food nutrition and give the basis of education among diversified groups. Urban areas provide a broader array of cultural food choices. The availability of these food choices becomes more prevalent. Income determines economic status and the availability of healthy food choices, whether it be more or less accessible (Turrell & Kavanagh, 2006). Vegetarian diets are influential when society relates to issues that affect personal morals and choices. Vegetarianism creates a link among society members that choose to consume a plant-based diet.

Research has shown that dietary knowledge, or the lack thereof, has been the primary influence of eating behaviors (Wardle, Parmenter, & Waller, 2000). A lack of knowledge about healthy foods leads to poor eating habits, whereas knowledge regarding dietary choices could lead to an increased consumption of healthy foods, including low-fat, high fiber, reduced sodium and sugar intake. Although national health and government organizations promote healthy

eating behaviors through a variety of programs, studies have found that educational differences in knowledge is linked to socio-economic food purchasing patterns (Turrell & Kavanagh, 2006).

The occupational influence, along with residential area, creates knowledge beyond the classroom for individuals. Differing occupations provide diversification and culture that extends experiences and awareness of day to day activities. Motivational influences from occupations affect society's knowledge of food choices. Previous studies have shown that nutrition has a direct influence on social interaction (Lihoreau et al., 2015). Depending on location, the influence that individuals have on one another is a strong factor when considering the effects of a vegetarian diet. Location is a strong component for nutritionally related motivators. Research has shown that geographic location and the distance between consumers causes a division or alienation among society, creating unequal opportunity for the purchase and consumption of healthy food options (Risku-Norja, Hietala, Virtanen, Ketomäki, & Helenius, 2008). Vegetarianism is more prominent in larger, urban areas where the population is higher and the diverse culture is abundant, due to more economic opportunities. Work environment also creates a class of social groups and peers that are influential among dietary quality and food choices. Vegetarian diets are socially influenced by personal choices regarding health, the environment and animal welfare.

Income related to dietary choices is a socially and economically related factor. Research has shown that there is a common link between household income and food purchasing behavior. Consumers with lower income levels are more likely to purchase foods that are not reflective of dietary guideline recommendations and base their behavior on economics, food storage, and availability. Studies have noted that lower income households contain less knowledge regarding

food nutrition than households with higher income levels (Turrell & Kavanagh, 2006). Dietary knowledge and budget constraints were barriers that were involved with purchasing behaviors among lower income households (Huang, Edirisinghe & Burton-Freeman, 2016). Although updated research is needed to determine if past studies remain true, low-income households perceive healthy food choices to be more expensive than unhealthy food options (Lallukka et al, 2010, Turrell; 1996; Lawson, 1993). Often times, the impact of poverty and food availability can lead to households struggling with food insecurity and compromised nutrition (Oldewage-Theron, Dicks, & Napier, 2006).

Vegetarianism is viewed as diet with boundaries, but moving forward, vegetarian diets should be looked at as a teaching method for households. The idea of cooking meals using fresh produce while also saving money and practicing a budget system gives families a sense of freedom. Vegetarian diets are beneficial for households because of the low cost of production of fruits and vegetables. Another budget-savvy technique is gardening. Gardening classes demonstrate how individuals can use small or large spaces to grow fresh produce. Advising people on the benefits of consuming a vegetarian diet can benefit households by cultivating gardens, preparing and cooking meals, while saving money. The St. Louis Healthy Corner Store Project was launched in 2011 as a means of providing urban households with access to healthy and affordable food options by partnering with corner stores to regularly stock a variety of healthy foods, such as fruits and vegetables and whole grains (University of Missouri Extension, 2014). The overall result provided many households with increased access to healthy foods, economic benefits to local food retailers and the community, and nutrition education to store owners and consumers. Research has shown that increased knowledge about nutrition are

associated with increased sales of healthy foods, such as fruits and vegetables (Glanz & Yaroch, 2004).

Family Life

Social changes present challenges to families. New technology produces many new conveniences for day-to-day living, but the constant contact with a device takes away from human contact. Other factors play a role in the mundane tasks that employ society's time, such as work, running errands, household duties, extracurricular activities, and differences in schedules among household members. Whatever the situation may be, families are spending less quality time together (Craig & Brown, 2017). Research suggests that other than not having time to prepare a meal, the lack of parental competence for preparing and cooking as well as the inability of meal planning were the primary reasons for households to purchase pre-packaged and processed foods (Horning, Fulkerson, Friend, & Story, 2017). The absence of skills required for meal preparation and budgeting provides a perceived assumption that pre-packaged meals are beneficial to households. Providing families with tools and resources that allow them to learn how to buy, prepare, and cook meals that are healthy and beneficial will provide younger generations the opportunity to understand the importance of family meal time. A vegetarian diet is a powerful way to teach families how to meal plan. Purchasing fresh produce, learning the difference between organic and non-organic, price per ounce, serving sizes, and how to cut and prepare different types of produce is a knowledge that is learned through experience, repetition, and choice. Family meals provides quality time for households. Meal preparation can be done together and used as a teaching tool for young children. Preparing plant-based foods teaches individuals, young and old, the value of food security and nutrition. A vegetarian diet is a

positive way for individuals to learn basic cooking skills, family meal planning, and ensuring quality, nutritional food is being served to the families.

Personal Justification for Food Consumption Choices

Society's views on vegetarian diets range from moral, spiritual, financial, environmental, sustainability, food safety, animal welfare, and nutritional reasons. Society uses moral reasoning to justify their actions. For example, is animal suffering worth obtaining nutrients that can be obtained eating plant-based foods? Other reasons derive from spiritual or religious reasoning. Some religious groups believe that animals are sacred and therefore refuse to consume meat (Walters & Portmess, 2001). Some members of society believe that it is simply immoral to consume meat (Rosenfeld & Burrow, 2017; Rowlands, 2013; Eisnitz, 2009). Whatever the reasoning may be, examining common beliefs provides insight to the personal justification of refraining from meat products and consuming a vegetarian diet.

Environment and Extinction

The interest in animals and their use to humans has become more prevalent since many more species have been added to the extinction list. Animals may be put on the extinction list because of several reasons, such as destruction of habitat, over-hunting the animal, and chemicals that cause death (Kennedy, 2016). Whatever the case may be, in light of the growing extinction list, many individuals have a desire to care for the environment and the animals by abstaining from meat based products. The environment and natural habitats for insects, birds, animals, and water fowl can be a species' only hope of survival. The climate, temperatures, and rainfall all play a specific role in maintaining diversified species on the planet. When the

rainforests are cut down, or lakes and ponds dry up, natural habitats become obsolete, causing the species to look for another home or to die from lack of needed resources. Many agriculture related industries that thrive on supplying animal products cause environmental destruction (Fearnside, 2001). Humans cannot replace what nature creates for other species. Caring for the environment will protect species as well as humankind (World Wildlife Fund Organization, 2017). A vegetarian diet supports the protection of the environment by making the consumer aware of the foods that are grown in areas where the destruction takes place. Consumers of a vegetarian diet choose a vegetarian diet for different reasons. Some of those reasons relate to the environmental impact that traditional diets have on the land and water. Becoming aware of the importance of protecting the environment is a big step in choosing to consume a vegetarian diet. Vegetarianism offers consumers the chance to engage in a learning process of how their choices affect different aspects of life.

Animal Welfare

Societal perceptions and acceptability regarding animal welfare has drawn attention to factory farming operations. Research has shown that factory farming operations are a danger to the health of humans, animals, and the environment (Pluhar, 2010). Animals raised on factory farms are separated from their natural habitats and confined in such small cages that they often suffer deformities. Factory farming for pork and poultry studies have examined issues of overcrowding, product quality, and stress on animals. Studies have shown that handling procedures of these types of animals is problematic (Delezie, Verbeke, De Tavernier, & Decuypere, 2006). Confinement of animals can compromise their immune systems, causing them to become susceptible to diseases, becoming a risk to humans that consume them (Hribar,

2010). The diet that factory farm raised animals consumes is often an unnatural diet. Due to the lack of a healthy habitat and non-nutritional diet, animals are given antibiotics to ward off infections. This contributes to the development of antibiotic resistant bacteria that affects humans (Grace Communications Foundation, 2016; Cordova & Kaplan, 2014). Inhumane treatment on factory farms includes cutting of pig and cow tails, de-beaking of chickens, castration, deformities on pig feet from concrete floors, mass body growth for chickens cause their bones to become unable to sustain their weight causing a lack of mobility, starvation of laying hens, stun baths, injuries sustained during transportation to slaughterhouses, and removal of dairy calves' horns. Furthermore, the removal of dairy calves from their mothers creates high production yields that leads to painful mastitis, (Moses & Tomaselli, 2017; Grace Communications Foundation, 2016). Many of these procedures are performed without the use of anesthetics and routinely cause infections for the animal (Grace Communications Foundation, 2016; Williams, 2008; Mason, 2006; Underwood, 2002). These treatments are unnecessary and cause extreme stress and pain for the animal. Reasoning's for such disturbing treatments range from the prevention of fighting to larger profits. The lack of morals and sympathy from the harsh environment creates an unprecedented awareness that addresses these issues through the consumption of a vegetarian diet. It's been said that the best answer is often the simplest answer. This is true with a vegetarian diet. Although the consumption of a vegetarian diet starts with one individual, the growth and influence from one person to another creates a circle of protection around animals. Raising awareness for animal welfare from the consumption of a vegetarian diet can allow for a change in direction among society. Perhaps a vegetarian diet is a way for society to speak their voice concerning the wrongful sufferings inflicted upon animals for the production of food.

Conclusion

For many of today's common health problems, such as high cholesterol, high blood pressure, increased risk of cancers, irritable bowel syndrome, heart disease and weight problems, a vegetarian diet can provide benefits that can treat, prevent and cure some human illnesses, yet the positive impacts of eating a vegetarian diet are too often dismissed by medical professionals. By providing individuals with the knowledge and motivation to search beyond quick fix medications and temporary relief aids, people will be able to have a greater understanding of how to alleviate, cure, and prevent diseases and illnesses that plague so many lives.

As well as benefiting the health of individuals comes the benefit of improving the environment. The environment is impacted by humans' daily choices, whether it be deciding what kind of car to drive, installing solar panels on a home or choosing a diet that will have benefits for the environment. What people choose to eat today and how we choose to grow, produce, and transport food and food products affects not only the current generation, but future generations as well. Incorporating environmentally-friendly agriculture farming practices while also engaging in the consumption of a vegetarian diet will benefit the planet by properly caring for the environment. Sustainable agriculture practices benefit the environment while also ensuring profit maintenance for the economy. Providing a common ground for the demand of animal sources while maintaining the ecosystem is a necessary component in food production.

Economically, a vegetarian diet provides many positive outcomes for communities, states, and nations. Locally grown produce creates income for small farmers that will benefit rural communities. Organic farming practices have been shown to be economically productive while also providing benefits for the environment. The ability to create awareness of the effects

of a vegetarian diet have strong impacts the economy. The economy fluctuates based on supply and demand. When the supply is plentiful, market prices decrease, but when the supply is limited, prices rise. The same is true with farming practices. Finding balance that benefits the environment while sustaining the economy while also meeting the demand for food production is not an easy task. Factory farming and conventional farming practices use high levels of energy sources and fossil fuels to produce food. Dairy productions, poultry farms, livestock farms, and swine houses are used to produce foods that become packaged for grocery-sell use, such as hotdogs, yogurts, bacon, sliced cheese, jerky, and many other products. The cost of preparing the animal protein sources, packaging, and transporting is a high expenditure. So, the question becomes, is it worth continuing to use factory farming techniques to produce large amounts of meat products, in order to maintain the economy while neglecting the environment? Would the economy flourish if less packaged products were sold and more premium-priced produce was available? Does a vegetarian diet help the economy? Research on sustainable farming practices along with the research on vegetarianism suggest that the influence to be better stewards of the environment will help the economy, satisfy society, and benefit human health.

Nutrition affects all walks of life. Individuals, animals, plants, and organisms rely heavily upon nutrients to fuel growth. Society plays a fundamental role in the makeup of nutrition ecology. The behavior and social interactions among members of society are largely defined by nutritional choices. Influences that affect society's views on nutrition and dietary choices are education, occupation, and income. These three factors provide a foundation for individuals to build upon that define their dietary choices. Factors that impact these choices are closely related to morale reasoning and spiritual reasoning. Research based studies have given understandings that affect society and its overall food purchasing decisions. Many of these

factors are directly related with family and lifestyle. Other societal based choices stem from childhood experiences. Some people were taught to cook at home while others may have been accustomed to eating at restaurants throughout the week. Whatever the case may be, many influences propel individuals to develop their own nutritional customs. Consuming a vegetarian diet is influential among society. Society can make a choice to use food for nourishment and well-being while also contributing other facets of life forms.

A vegetarian diet is a not a quick-fix medicine for all aspects of life, nor should it be taken lightly. Vegetarian diets should be viewed as a lifestyle change over time, rather than a diet or food fad. The ideas learned from consuming a vegetarian diet can be used to teach others the values that are gained from preparing, cooking, and eating healthy, nutritious plant-based foods while understanding the importance of protecting the environment, creating a profitable economy, and being a positive influence among society members. A vegetarian diet should be perceived as a way to impact life and it should be a representation of oneself. The benefits gained from eating a vegetarian diet are many, but when an individual decides to do it for their own personal reasons, then that will make the biggest difference of all.

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