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Throughout my SUNY Purchase college journey, I have taken multiple intriguing classes that have helped shape me into having a more thoughtful perspective on what food I put into my body. One of the classes which helped provide me with that thoughtful perspective was the course: “Energy and Society”. Throughout this class, I was enlightened on which foods harm the environment the most, as well as why climate change is an extremely important and urgent issue today. Ever since taking this class, I was much more well aware of what I was doing to help the environment as well as what I shouldn't do for the environment. The issue of climate change made me realize that everyone must play their part in doing all that they can to live an eco-friendly lifestyle, whether that be eating habits or living habits. Although everyone has their own individual eating habits, the process of producing meat/beef is an extremely significant contributor to the world's pollution output. The amount of emissions must be lowered crucially to help combat climate change. Therefore, the question is asked : “**Which climate-friendly foods can be consumed instead of processed foods?**”. Plant based foods which are rich in hearty vegetables such as broccoli and spinach could be some alternatives to a heavy-meat lifestyle. After taking “Energy & Society” my perspective on climate change had changed drastically thus urging me to look more into the topic. It is plain to see that the question can be asked when it

comes to the issue on climate change within the modern-day : **“Which climate-friendly foods can be consumed instead of processed foods?”**.

Literature Review

In modern day society, the Earth’s climate is being negatively affected due to the emissions of greenhouse gasses, mainly due to meat processing. When considering the health benefits of intaking natural plant based foods rather than those that are processed and contain meat, it is clear that plant based foods should be consumed much more often. Therefore, the question is asked : **“Which climate-friendly foods can be consumed instead of processed foods?”**. Many different discussions can be presented such as which foods can be chosen, how exactly the meat process negatively affects the environment, and the awareness of animal welfare.

The first discussion, regarding which foods do in fact harm the environment is essential within the present argument for it provides significant information regarding climate change effects due to food production. Climate change is a huge issue with today's rapidly growing world. Although, transportation is not the leading contributor to the world greenhouse gasses emissions. To be exact, the livestock industry emits about 51% of the globe's total carbon footprint. “Livestock are already well-known to contribute to GHG emissions. Livestock's Long Shadow, the widely-cited 2006 report by the United Nations Food and Agriculture Organization (FAO), estimates that 7,516 million metric tons per year of CO₂ equivalents (C0₂e), or about 18

percent of annual worldwide GHG emissions, are attributable to cattle, buffalo, sheep, goats, camels, horses, pigs, and poultry. That amount would easily qualify livestock for a hard look indeed in the search for ways to address climate change” (Goodland, R., & Anhang, J. (2009, Nov). With that being said, It is simple to visualize the effect that meat processes have on the earth’s climate. It is undoubtedly that emissions from the meat industries negatively affect our air. Additionally, the climate can also affect cattles lifespans. For instance, the grazing systems and grasslands in which cattles eat from can be negatively affected due to climate change, thus impacting cattle lifespans. (P, R. R. X. P., Hasenack, H., Pereira, G. R., Dewes, H., Canellas, L. C., Oliveira, T. E., & Barcellos, J. O. J. (2018). Additionally, food production and consumption contribute significantly to the acceleration of global climate change. About 10–20% of the world’s greenhouse gas emissions derive from food production and consumption in developed nations (Mäkinemi, J., & Vainio, A. (2013) . Although meat is not beneficial to process for the environment, some meats in fact produce more greenhouse gasses than others. The general pattern is that beef has a much higher GHG intensity than pork, which also has a somewhat higher GHG intensity than meat from chickens. Some of the main reasons for this are the high methane emissions in ruminants, like cattle, due to enteric fermentation (Lerner, H., Algers, B., Gunnarsson, S., & Nordgren, A. (2013). This subtopic is reviewed through numerous different sources visualizing the bigger picture on the meat processes’ downsides on our global environment.

Following the subtopic regarding the livestock & meat industries and their negative environmental effects, substitutes for meat products are discussed thoroughly in the next subtopic which is “ Climate Friendly Foods”. Climate friendly foods are plant based alternatives to traditional meat based products, and highly processed or GMO foods. Thankfully, some

countries around the world are way ahead of the problem and are already attempting to implement new dietary guidelines that steer clear of beef and other meat and stick to more natural vegetable-based meals. For instance, New Zealand has dietary guidelines which provide greener alternatives to greenhouse gas producing food processing. Alternatives provided include poultry or beef instead of lamb and beef as well as replacing meat based-meals with two servings from the NZDG legumes, nuts, and seeds categories. With these alternatives in mind, it is essential to consider that even the least greenhouse gas emitting foods produce less emissions than virtually most plant based diets and meals. (Drew, J., Cleghorn, C., Macmillan, A., & Mizdrak, A. (2020). Clearly, New Zealand has taken huge steps in considering plant-based alternatives to meat-based meals. This is a main reason why New Zealand is fully aware that the dietary everyday choices that individuals make are crucial in how they affect the environment around them.

The final discussion regarding the topic of climate change comes across when observing the welfare of animals within this country, more specifically, farm animals. The discussion specifically is reducing inhumane farming. The process of murdering a helpless animal is a different topic when you have to survive and have no other foods. Although, since most countries have a decent food supply chain, it makes the slaughtering of animals just for a preferred meal that much less acceptable. Initially, it was discussed within the literature how it is morally wrong to cause pain to anything for any reason even if you benefit from it. Although, eating meat in today's day in age is not necessary for survival. Factory farming is wrong since pain is caused for no morally beneficial reason. "The derhorning, neutering, confining of animals is very cruel which serves no good." (Bobier, C. (2019). The author visualized the true horrors in which an animal has to endure throughout their life just to be slaughtered relatively

young. Dehorning and neutering the animals is yet another selfish practice that farmers feel as though they have no choice but to do so. In fact, those who are found to be cruel to their farm animals can pay a large fine. For example, in Australia, the average fine for public exposure animal cruelty towards a farm animal is on average \$1321 (Morton, R., Hebart, M. L., & Whittaker, A. L. (2018). These fines are put in place to help prevent animal cruelty on farms and gives the farmer some incentive just to keep their animals living a happy life. These animals, regardless of how they look or smell, deserve to live a happy full life in a non-crowded, natural environment.

These discussions are extremely relevant to the topic of climate change because of the ongoing climate issue within today's society. These discussions assure that each factor of reducing animal meat processing is reviewed to supplement alternatives, discuss how exactly it negatively contributes to the environment, as well as awareness about farm animals welfare. Within today's rapidly going technologically advanced world, the food choices that individuals make everyday can negatively affect our environment. The meat industry is responsible for most of our world's greenhouse gasses. Animal welfare is being violated, although there are numerous alternatives to consume to reduce the horror these animals endure. These topics contribute to the general question of : “**Which climate-friendly foods can be consumed instead of processed foods?**”. Plant based foods which are rich in hearty vegetables such as broccoli and spinach could be some alternatives to a heavy-meat lifestyle.

Method

For this specific discussion, the method chosen to articulate the evidence provided was further library research. Further library research allowed more information and perspectives to be considered within the question of : “ **Which climate friendly foods can be consumed?**” The subject of the further library research provides evidence supporting the finding that meat processes can have an extraordinary amount of negative effects on the environment.

Materials

The materials provided were found within the Purchase Library databases on the website. This linked me to the Environmental Science database. This database linked me directly to critical points which support the correlation of meat processes and climate change. After searching within the search bar “ Climate Change and Meat”, I was provided with hundreds of verified sources that provide information on this topic. I then chose the peer reviewed checkbox so it was assured that the information provided was peer reviewed. I then analyzed the sources and cited them adequately.

The articles collected reflected the discussion by providing details on the following sb section in which were: **Clarifying the relationship between meat processing/farming and climate change, climate friendly foods, and improving animal welfare.**

Design and Procedure

After reviewing and analyzing the multiple different sources that have come across during research, it was from those peer-reviewed sources in which I observed and found many important details and information supporting this discussion. After hand-picking relevant sections within the observed articles, they were used to help support the discussion and the main research question of: “ **Which climate friendly foods can be consumed instead of processed food?** “

Results

After analyzing all peer reviewed sources chosen for this discussion, there were several sources for each subtopic consisting of: **Clarifying the relationship between meat processing/farming and climate change, Climate friendly foods, and Reducing inhumane farming.**

The first subtopic that will be reviewed is **Clarifying the relationship between meat processing/farming and climate change.** Climate change has been an ongoing issue on the planet, Earth, for several decades. This is supported throughout findings within literature. The Livestock's Long Shadow, the very widely-cited 2006 report by the United Nations Food and Agriculture Organization, has estimated that about 7,516 million metric tons per year of CO₂ equivalents (CO₂e), or roughly 18 percent of annual worldwide GHG emissions, are attributable to cattle, buffalo, sheep, goats, camels, horses, pigs, and poultry (Goodland, R., & Anhang, J.

(2009, Nov). This article provided this discussion with the facts that the 7,516 metric tons of CO₂ equivalents are derived directly from the meat processing production, specifically of cattle. This statistic further proves that there is in fact a positive relationship between the amount of cattle and other farm animal meat processes and the world's greenhouse gas footprint. An additional piece of literature that assists in supporting the subtopic discusses that out of all of the livestock greenhouse gas emissions emitted, beef cattle is responsible for about 54% of greenhouse gas emissions of livestock. This statistic provides the discussion with more hindsight of the infamous meat industries more specifically, the beef cattle industry. Another piece of information that clarifies the relationship between climate change and meat processing is that the climate change in fact alters the food supply because of the emitted pollutants. For instance, the grazing systems as well as mixed rain-fed systems, which depend on the availability of pastures and farm crops, would be most damaged by climate change. The findings throughout this individual study are relevant to the agents of the beef cattle supply chain to provide strong information to evaluate the economic impact of weather changes on food production that will lead to an increase in animal demand by farmers and by the industrial section (P, R. R. X. P., Hasenack, H., Pereira, G. R., Dewes, H., Canellas, L. C., Oliveira, T. E., & Barcellos, J. O. J. (2018). This finding provides the reader information portraying that the beef supply can actually increase as climate change negatively affects crops. An additional piece of literature that contributes to the discussion of clarifying the relationship between meat processing and climate change is shared when discussing additional components of meat processing and their emissions. The emissions from livestock are staggering, although not all emissions are being taken into account for. Additional emissions that are released include emissions that come from the animals and manure, the cultivation and fertilization of feed crops and pastures, land-use

changes, such as destructional deforestation and grassland conversion, and emissions caused by the production of inputs (including fertilizers), transporting and processing. These pressures have been caused by the massive growth of industrialized animal production during the 20th century, which made animal meat to surpass bread and wheat products as the chief source of protein in Western countries (de Boer, J., Schösler, H., & Boersema, J. J. (2013). This piece of literature visualized the additional components of meat processing and their negative effects on the environment that are often overlooked. The final piece of literature reviewed portrays that eating less meat will in fact be beneficial to our ecosystem. For instance, recent studies among meat consumers in Northern and Western Europe show that, despite a scientific consensus that meat is very burdensome for the environment and the climate in specific, most people are unaware of the environmental impact of meat consumption. However, even when they are presented with specific scientific evidence linking meat consumption and climate change, consumers may not accept this information as genuine or relevant environmental knowledge to change meat eating patterns (De Groeve, B., & Bleys, B. (2017). In other words, scientific studies have provided facts on the negative effects of climate change, although it shows that many consumers are hesitant to accept this information and alter their lifestyles. This issue leads into the next discussion which is Climate friendly alternatives to meat.

Alternatives to lifestyles must be made in order to take action within our climate crisis. This could mean several different things from just being more sustainable to eating plant based meat alternatives. Plant based meat alternatives serve as a great alternative to meat because of their savory meat- like taste. Scholars argue that alternating to plant based foods can be extremely beneficial to our environment. For example , Stehfest et al had estimated that a global transition towards a low-meat diet would significantly reduce total mitigation costs by as much

as 50% in 2050. Additionally, it was discussed how eating less meat is therefore often considered an easy, cheap and effective way to be more climate-friendly. (De Groeve, B., & Bleys, B. (2017). This is a compelling piece of evidence that supports the subtopic of: climate friendly foods. Alternating lifestyles to consume less meat can cut total mitigation costs in half which would be extremely beneficial for economies as well as animal welfare. Another supporting point that accompanies the discussion of consuming climate friendly foods includes the point that some processed meat can actually be very poor for your health. For instance the production and consumption of red meat as well as processed meat is associated with a much increased risk of cardiovascular disease, adult type 2 diabetes, and certain cancers while also being highly emissions-intensive (Drew, J., Cleghorn, C., Macmillan, A., & Mizdrak, A. (2020). This fact is baffling because people continue to do harm to the animals they eventually consume as well as do harm to their own physical health. The fact that red meat and processed meat is a huge contributor to the high rate of cardiovascular disease in modern-day adults is an indicator that many adults should consider changing their diets. Additionally to the downsides of meat for your health, wholesome and sustainable alternatives are extremely beneficial for the environment. For instance, whole plant foods, including vegetables, fruits, legumes, and whole grains were substantially less climate-polluting (1:2–1:8 kgCO₂e=kg) than animal-based foods, particularly red and processed meats (12–21 kgCO₂e=kg) (Drew, J., Cleghorn, C., Macmillan, A., & Mizdrak, A. (2020). That being said, the vegetable, legume, and fruit food groups are extremely sustainable as well as nutritious and could serve as an effective alternative to a meat based meal. Finally, there are local policies which may take place to reduce the meat consumption within that area. For example, the policies may include, using institutional pledges and proposals, legislation, as well as taxes and subsidies to help shape and regulate the production and

consumption of animal-sourced and plant-based foods (Graça, J., Sónia, G. C., Fábio, R. A., & Nádia, C. N. (2020). This provides the discussion with hindsight providing knowledge of the increased desire to regulate animal based foods so slaughtering can happen less frequently. This is clearly a step within the right direction for changing diets away from animal based foods will be an extremely significant accomplishment, either locally or nationwide. It is plain to see that adjusting diets towards **climate friendly food** alternatives can be extremely beneficial to your health as well as the world's health.

Lastly, the main issues within the meat processing industry have a lot to do with the inhumane treatment of animals at some farms as well as concern for their overall welfare. Animals are all beautiful creatures which deserve to have a life without pain or suffering for the preference of a meal. There are multiple different perspectives in the final discussion regarding animal welfare within the farming and meat processing systems. To begin, the derhorning, neutering, confining of animals within the farm and meat industries is extremely cruel and should not be practiced for it serves no good (Bobier, C. (2019). Causing unnecessary pain and damage to these animals makes no sense when they will eventually get slaughtered anyway. It is extensively argued that this issue relies on a prima facie plausible moral premise, in which causing massive unnecessary harm is wrong—and one empirical claim— factory farming routinely and unnecessarily harms animals (Bobier, C. (2019). Factory farms as well as other farms often make the moral mistake of mistreating their farm animals. For example, there are many different fines for farm animal mistreatment. The average fine given for offences against farm animals is \$1321.13, which is almost double the \$703.71 fine for offences against companion animals. While the average prison sentence for offences against farm animals is 105 days, in comparison to the average 40-day sentence given for companion animal offences

(Morton, R., Hebart, M. L., & Whittaker, A. L. (2018). This statistic portrays that fines for harming farm animals are higher to enforce the laws that harm animals shouldn't be mistreated. Additionally, England and Wales implemented the Animal Welfare Act 2006. This act includes a duty of care to provide for the needs of protected animals for which humans have permanent or temporary responsibility of the Animal Welfare Act 2006 sets out an animal's "need to be protected from pain, suffering, injury and disease." (Scott, P. R. (2013). These acts being implemented is a fantastic step within the right direction to attempt to halt all wrongdoings towards farm animals. Without acts and regulations similar to the ones discussed, much more of inhumane treatment of animals would go on at farms worldwide. It is plain to see that **improving animal welfare** is an essential point of focus for this discussion

Conclusion

Conclusively, after reviewing all sources there were clear connections made between each of the subtopics in which were: clarifying the relationship between meat processing and climate change, climate friendly food alternatives, and reducing inhumane treatment of farm animals. The literature reviewed paved the way for this research to be conducted. This study was created to help seek awareness for the ongoing climate crisis throughout our planet. It is plain to see that when the question, "**Which climate-friendly foods can be consumed instead of processed foods?**", is asked, it can be explained through findings regarding the relationship between meat processing and climate change, climate friendly meat alternatives, as well as distinguishing the inhumane treatment of some farm animals and seeking to improve their welfare.

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