

**How Does Animal Agriculture Impact the Environment?**

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### **Abstract**

Throughout the years we have grown familiar of the terms climate change and global warming and their impact on our planet. Though the effects of these changes were said to be so far from our current generation's views, we have seen the impact in all parts of the world; melting ice caps, decline of natural resources and rises in sea levels, just to name a few. With the statistics involving climate change, we have also been greeted with a number a causes. While some argue for a number unsustainable practices to be the central reason, namely means of transportation, fracking, even mountaintop removal, others believe it is naturally occurring. Although these are all important, one of the greatest impacts is by the animal agriculture industry, responsible for 18% of the world's total greenhouse gas emissions (Lappé 2010). Considering our dietary habits are something we have a direct impact on, I believe this is a conversation worth having. Factory farms thrive because of our support in purchasing their products.

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## **Introduction**

### **How Does Animal Agriculture Impact the Environment?**

Daily, we are confronted with the reality of the damage we have caused the planet. The planet's condition is seen in the ever so worsening state of global climate change, levels of air and water pollution, public health conditions, even the depletion of natural resources. Though these are just a few of the plethora of man-made catastrophes of our lifetime, they are more than enough evidence that shows we must take action to change the current state of our planet. The damage we have caused once seemed so far from our generation's experience is now being revealed to happen within the next thirty years. All of these issues have one thing in common, which is human interference. To some degree, these problems are caused by the choices we make or choose to indulge in daily. Some examples of this include our dietary choices, modes of transportation, deforestation, fracking, along with so much more. Despite what seems to be irreparable damage caused by the industries promoting these choices, they seem to only increase in number and gain. The reason is because not only are these industries incredibly profitable, but our society and economy are constructed in a way that they are the only options, creating monopolies, leaving all power in the hands of a few. By creating regulations and a strict economic structure, small businesses are either forced to comply or be bought out by these major

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companies. The goal in doing so is to create a competitive environment in the economy so that only monopolies exist and have complete control over the public's dollars.

Contrary to popular media belief, one of the greatest culprits of environmental damage is the factory farming and animal agriculture industries. Factory farms have been a major cause for the spread of disease, the accumulation of greenhouse gases such as carbon dioxide and methane, depletion of resources like water and land, and water and air pollution. Even prior to the animal agriculture industry, there was a change in the types of foods we consumed. Throughout the 1960-1970's 'Hippie's' lifestyle, an increase of whole foods such as sprouts, brown rice, tofu and yogurt had been implemented across places like Vermont, Oregon and Michigan (Kauffman). This way of life encouraged the growth of organic and personal food growing options that were not necessarily prevalent during this time period. Despite the innovative and healthy way of life promoted by this movement, it did not stop what was to come of the food industry. The way in which animals are raised and processed in today's society is not how it has always been done. Throughout the late 1990s and early 2000s, there was a tremendous economic shift that changed the food industry of the United States.

Prior to the boom of factory farming, existed smaller farms dedicated to cows, pigs, and dairy, which are now disappearing and nearly depleted. Several factors cause the rapid growth of these factory farms. One of these factors is the animal feed industry striving to produce feed at the lowest cost. As a result, this led to an overproduction of crops like corn, soybeans and oats, an unnatural diet for cows, making the cost of feed lower than the cost it takes to raise the crops. Considering this land was no longer needed for animals to pasture or grow feeding crops, it became more cost effective to house an absurd number of animals in factory farming facilities.

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These farmers are hired by companies like Purdue to raise their products to be sold in supermarkets. In this process, farmers are forced to comply with ever changing demands and regulations for new equipment and housing in fear of losing a contract. Each demand has a history of animal abuse and unsanitary methods of housing. These policies “often proved disastrous for crop farmers because, in most years, they were paid little for their production, and the new policies facilitated a transformation of livestock production into factory farming” (Food and Water Watch, 2010). In the documentary, *Food Inc*, Carole Morison explains the abuses of Purdue as she states “...the grower has no choice. They have to do it [comply with company demands] or you’re threatened with loss of a contract...The companies keep the farmers under their thumb because of the debt the farmers have” (Kenner, 2008).

By now, it is understood that all else is of little to no importance in comparison to the need for profit. With this in mind, the second factor contributing to the growth of factory farming is the complete disregard and monitoring of waste disposal. To properly dispose of waste in this sector involves a large sum of money, in which by disregarding this issue, these expenses are saved, only leaving room for more significant profit at little cost. Though the United States (US) Environmental Protection Agency’s (EPA) job is to monitor factory farms, it seems as if nothing is being done to prevent or aid in waste removal and management. The lack of attention allows factory farms to grow larger in size and multiply without proper regulation. Lastly, “unchecked mergers and acquisitions between the largest meatpacking, poultry processing and dairy companies created an intensely consolidated landscape where a few giant agribusinesses exert tremendous pressure on livestock producers to become larger and more intensive” (Food and Water Watch, 2010). In other words, larger scale companies can drive out small, independent

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farmers leaving these big agribusinesses dominating the field in the United States. Having this amount of power in the hands of the few, becomes incredibly dangerous economically and socially, creating a more significant divide between the haves and have nots. These monopolies are in complete control of what we put into our bodies and how we can obtain our food, putting the public's health at risk. Additionally, having the animals packed into these facilities, they are surrounded by their own and others feces for many hours a day. The close quarters makes animals prone to disease which is carried over into the processed food we get in supermarkets.

The levels of manure produced on these farms can become a health hazard for multiple reasons. The manure has air pollutants putting the health of workers and those in surrounding areas, even thousands of miles away, in danger and the manure seeps into the waterways. The pollution is also seen by the deforestation needed to create room for these farms, not only destroying essential parts of rainforests and limiting biodiversity but releases tons of Carbon Dioxide emissions. These are only a few of the many ways in which animal agriculture but more specifically factory farming impacts our planet. By applying more sustainable practicing, consuming less meat, or consuming a plant-based focused diet, we can reduce Greenhouse Gas Emissions by a half.

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## Literature Review

### Organizations and Resources

Though animal agriculture consists of its breakdown of Greenhouse Gas Emissions, it is connected to multiple other sectors contributing to the process but from what seems separate from it. Though we may be able to account 13.5% of total carbon dioxide emissions to agriculture, the food system is connected to sectors like energy supply, transportation, industry, forestry, and waste. Each one of these sectors assists in making the animal agriculture industry flourish, hence why the industry accounts for 18 percent of the global warming effect. The global warming effect is more than the entire transportation sector (Hansel, 2018), contrary to the information spoon fed to us on the daily. Popular media, politicians, even some nonprofit organizations have portrayed different aspects of our world to be leaders in the decline of the health of our planet, in attempts to fight the good fight in defense of our planet. Companies such as Greenpeace, Oceana, Amazon Watch, including many more, are tackling issues regarding plastic and pollution of our oceans, the destruction of Rain Forests for palm oil and conflict surrounding climate change. All of these big-name companies have dedicated years to saving the planet in more ways than one. However, many of these companies are quiet about a major factor regarding all of these sectors related to the decay of the planet, and that is animal agriculture. In the documentary *Cowspiracy*, Kip Anderson and Keegan Kuhn set out on a journey to get to the core of our choices and the impact on the planet. Throughout this process, they contacted a multitude of these organizations in hopes to have some questions answered. Quite a number of them refused to agree to the interview. The question that comes to mind is whether or not these companies are receiving payment or support from agribusinesses in exchange for the blatant

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disregard of animal agriculture in their plans. As great of an issue as animal agriculture is to the planet, there has to be a reason as to why these individuals and companies are avoiding it at all costs.

### **Land Use**

One of the most significant issues with animal agriculture is the depletion of resources, the land being one of the most critical aspects. In regards to the amount of land allocated to food production, Brooks mentioned “71 percent of our land is considered habitable, and half of that land is used for agriculture. Of that 50 percent, 77 percent is used for livestock, either as land for grazing or land to grow animal feed” (Brooks, 2018). One of the many facts about factory farming and animal agriculture that is hidden from the public is the possibility of ending hunger by ridding of them completely. Not only does animal agriculture take up space for the factory portion, where animals are milked, abused, and killed, but there are large amounts of land that is destroyed in the process. This land is of no use to the farms and is empty. Cows are naturally grazers and browsers meaning their diet would consist of grasses (grazing) and leaves or bark from trees and bushes (browsing). However, this is not beneficial or profitable to Capitalist America. With this in mind, cows are fed mostly corn and wheat. These two resources are both cost-effective and substantial enough meals to fatten cows in order to obtain more meat from them. In order to support this ever growing, fast-paced industry, even the feed is filled with hormones to produce more product, more quickly.

Additionally, the level of pesticides exposed to the land has made it so that no vegetation can be grown from it. Even though this land is not being used, it is no longer capable of supporting life for plants. With this in mind, it is crucial to consider that “Globally, there is

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enough cropland to feed 9 billion in 2050 if the 40 percent of all crops produced today for feeding animals were used directly for human consumption, while available grasslands were more efficiently used as the basis for livestock feed” (Sustainability Pathways, 2019).

Furthermore, “The Food and Agriculture Organization of the United Nations have estimated that 70 percent of land formerly supporting Amazon rainforests has been turned over to grazing” (Farmsanctuary, 2017).

### **Greenhouse Gas Emissions**

Before farms come to fruition, there is a grand process that must take place, beginning with deforestation. Today, nearly “three-quarters of Brazil’s greenhouse gas emissions stem from deforestation, largely the result of agribusiness expansion” (Lappé, 2010), as animal agriculture is one of the lead drivers of global deforestation. As the forests are cleared, the Carbon Dioxide emissions that are stored within the trees and plants during the photosynthesis process are released. These emissions “amount to roughly 0.65 gigatons of CO<sub>2</sub>e per year” (Climate Nexus). These gases are worrisome because of how effective they are at trapping heat. Animal waste and enteric fermentation release methane gases, accounting for 37 percent. Methane “has a Global Warming Potential of 23, meaning it traps heat twenty-three times more effectively than carbon dioxide over the course of a century” (Lapp, 2010). However, waste is not the only factor that comes from animal agriculture. Additionally, animal agriculture “compromises 44 percent of all anthropogenic nitrous oxide emissions, the most potent GHG” (Climate Nexus, 2019).

### **Manure and Waste**

In regards to manure specifically, generally speaking, it is not a bad thing. Manure is an essential part to farm soil, as it fertilizes it bringing necessary insects and nourishment animals

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that consume grass need. However, in animal agriculture, this is thoroughly different. In the U.S. alone, animals raised on factory farms generate more than 1 million tons of manure *per day* — three times the amount generated by the country’s human population (Farmsanctuary, 2017).

On factory farms, manure is held in holding tanks in which microorganisms break the manure down without oxygen. Through this process, the manure is converted into methane, carbon dioxide including other gases. Methane is also released through the animals through enteric fermentation in which “microbes and enzymes break down carbohydrates in the first of the four stomachs, the rumen” (Lappé, 2010). This is mainly seen through the animals passing gas orally and through the back end if you will.

Waste also becomes an issue as it relates to spills into water resources, whether involuntarily or directly placed there. These holding tanks in which manure is stored are referred to lagoons, each as big as several football fields, that are prone to leaks and spills. Often these spills consist of hundreds of thousands of gallons of manure leaking into water sources, killing fish and other creatures that reside in that area. Additionally, these companies will often disperse manure throughout different areas to avoid the cost of removing it off-site.

Aside from the pollution of water, water plays a significant role in the production of meat and the feeding process. Between watering the crops that farm animals eat, providing drinking water for billions of animals each year, and cleaning away the filth in factory farms, transport trucks, and slaughterhouses, the animal agriculture industry has a considerable impact on the water supply. Producing one pound of beef takes an estimated 1,581 gallons of water, which is roughly as much as the average American uses in 100 showers (Farmsancturay, 2017). According to *Conspiracy*, fifty-five percent of water use is dedicated to animal agriculture, “raising

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livestock just in the US consumes 34 trillion gallons of water” (Anderson, Kuhn, 2014). As one of the, if not the most important, resources necessary for the survival of most living creatures and organisms, this is a major concern for the furthering of our planet and the population inhibiting it.

Ultimately, despite the knowledge I have acquired throughout my years of passion for environmentalism and the future state of our people and planet, this research was incredibly revealing to me. Up until this point, my faith in humanity dwindled to the point of near depletion. This state of mind seemed so prevalent as Jonas Salk’s quote "If all the insects were to disappear from the earth, within 50 years all life on earth would end. If all human beings disappeared from the earth, within 50 years all forms of life would flourish” rang in my head. The most necessary course of action would be to get our people to understand and band together in our dietary habits, enough to avoid support to this industry, forcing them to change their ways and goals. If enough humans stopped support for the animal agriculture industry, we would be able to create a dent in their sales enough to call for attention and necessary reform. Another would be getting the public to implement sustainable farming practices and support for local farms, as opposed to large supermarket brands that are not dedicated the healthy, poison free products. With these goals in mind, my hope in our ability to come together in community was far from existent. However, throughout this project, I have gained hope with the vast perspectives I have encountered. My research revealed that much effort and willingness to implement practices from other countries can be possible through government reform and assistance. Though it may be difficult, it is vital that we do so.

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### Methods

Throughout my research, I realized that I would need a number of resources in order to get a true grip on the depth of the damage that is the animal agriculture industry. In order to do so, I wanted to move beyond the general education system and immerse myself in the world that is sustainable living. This process involved a lot of deep conversations and thorough searching. For this reason, I decided to break my research into two phases.

#### Phase 1

My first phase included research through books, the Inter-library loans, Purchase's library database and a number of reliable internet sources. I first entered our library's database, in which I dove head first into the world of animal agriculture. I connected the industry to the environmental impacts including depletion of resources, like water and land, the disposal and management of manure, and the connection to global warming through emission of greenhouse gases. This process allowed me to narrow the information that would be deemed helpful while others would be disposed and disregarded. Throughout this process, I also learned of our library's Inter-Library loan in which I could check out books from other libraries across the globe. Through this opportunity I was able to read Jonathan Kauffman's *Hippie Food: how back-to-the-landers, longhairs and revolutionaries changed the way we eat*, which spoke of the counterculture and unconventional practices of the 1960-1970's 'Hippie' movement changed the types of foods and the way in which we obtained our food for the future generations. Though it did not offer much on the animal agriculture industry, it did present an opposite perspective and a look into the possibilities that could have been.

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Aside from Purchase's library, I also visited my own town's library of Nyack. Here I discovered Anna Lappé's book *Diet for a Hot Planet: The Climate Crisis at the End of Your Fork and What You Can Do About It*. Lappé dissected the world of the animal agriculture industry by connecting it to the various industries all intertwined in contributing to the planet's downfall. Along with this, her travels, and interviews with small-scale farms across the globe revealed much about the possibilities of future reform.

### **Phase 2**

Aside from my traditional research in books and internet sources, I decided to broaden my research to those implementing the practices in real time, dedicated to the reform and education of the public and business owners that understand the importance of the change. In this process, I attended a number of panel discussions and community programs aimed to educating the public on the benefits of sustainable living practices and the environmental, health and ethical impacts of the animal agriculture industry. One of the events I attended was that of Nutrition Counselor and manager of the plant-based restaurant Urban Vegan Kitchen, Sam B, in the heart of Manhattan. At this conference, she spoke of the connection between a plant-based diet and disease and disorders within the human body. She correlated the possibilities of reversal of symptoms and complete elimination of diseases such as Diabetes and certain cancers by implementing a plant-based diet into our everyday lives. A few months ago, I also attended the "Roots and Vines" panel led by Casandra Rosario, CEO, and founder of "Food Before Love" in which discussed the importance of introducing sustainable food choices and farming methods into our urban communities specifically. The panel featured Omowale Adewale the Founder of

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Brooklyn's BlackVegFest and author of *An Introduction to Veganism and Agriculture Globalism*, the host of The Meatless Podcast, Alicia Kennedy and lastly the founder of OkoFarms, Yemi Amu. Each offered their own unique perspective towards the implementing of plant-based nutrition into our daily lives; some for more personal reason, while others were fighting for the prospering of their own communities.

I also had a few discussions with my peers, along with my former high school Physics teacher Michael Keelty. The main discussion was about the concept of global warming, as it was linked to the animal agriculture industry, each conversation surprising me in a number of ways.

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### Results

Through the indulgence of the variety of books, journals, and articles, I learned of the variety of sectors the animal agriculture industry pours into in regards to the destruction of our environment. Though this industry is responsible for 18% of all greenhouse gas emissions, it is directly connected to pollution of CO<sub>2</sub> from energy sources, the transportation sector, forestry, industry, waste, and wastewater. Though we may be able to technically label the animal agriculture industry as to blame for 13.5% of CO<sub>2</sub> emissions, it would be foolish to disregard its part in all the contributing factors. Much of the other results from Phase 1 of my research, I dedicated to the Literature Review of my research.

For the remainder of my results portion, I would like to focus on my findings from Phase 2 of my research. The first events I attended was hosted by the incredible Nutrition Counselor, named Sam B, who works alongside a Homeopathy based doctor, specializing in nutrition and natural based remedies. Throughout her discussion, she referenced *The China Study* by T. Colin Campbell, in which discusses the connection between animal-based proteins in relation to cancer risks, as well as her work with individuals suffering from Type 2 Diabetes in the reversal of symptoms, severity and the management of the disease. Aside from this, Sam spoke of the community that exists between plants and vegetables, specifically that of mushrooms. She spoke of the complex communications between the organisms, in which they can sense danger send messages to one another through the roots. From here, she connected the animal agriculture's destruction of these complex systems in abolishing these lands for factory farming. She spoke of the dangers of Monoculture, the agriculture practice of producing or growing a single crop, plant, or livestock species, variety, or breed in a field or farming system at a time (Wikipedia, 2019).

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Though beneficial and efficient for industrial farming, it is incredibly dangerous for the land because it leads to a haste accumulate of diseases and certain insects. In this process, the constant production of one particular crop, those used to feed the animals on these factory farms, makes the land susceptible to a pathogen. This makes the land barren and entirely unable to produce life.

At the “Roots and Vines” panel discussion, we met a variety of individuals all dedicated to the education of the public regarding a plant-based lifestyle. Alicia Kennedy’s main purpose was to open doors to those curious or unaware of the grand possibilities that a planet-based lifestyle can bring. Unlike myself, she was not convinced that completely ridding meat and other animal products from our diets would make a difference in our planet’s current state. She was more focused on the personal aspects of the transition. On the opposite end, Omowale Adewale and Yemi Amu dedicated their practices to the community and recognized the grand impact these changes can make. In Adewale’s book, he discusses the dangers of the animal agriculture industry in the poisons and hormones within the animal products themselves, GMOs, agribusinesses in Brazil and the connections between the Worldbank and farmers. He understood the need to learn to grow our own food to avoid the abuses of the industry. He refers to Monsanto, an agricultural biotechnology company, that sold seeds to farmers that would essentially destroy their land if a switch in seeds would be made, making farmers dependent and desperate for business. Yemi Amu discussed the practice of Aquaponics, a combination of both aquaculture and hydroponics, which

*“raise(s) freshwater fish along with a variety of vegetables and fruits Waste water from our fish tank is pumped through several plant grow beds to provide nutrient rich fertilizer for our plants. In return, the plants filter all of the toxic waste from the water so that*

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*clean water is returned to the fish. This constant cycling of nutrients via fish waste create an extremely efficient recycling system that allows us to grow vegetables, herbs and flowers thereby avoiding the toxic environmental run-off that characterizes current aquaculture practices” (OkoFarms, 2019).*

Amu along with her partners created an Aquaponics farm in the middle of Brooklyn in which the community can participate in. She emphasized the importance of creating more sustainable practices, especially within urban communities like Brooklyn where fresh fruits and vegetables are not readily available. With this in mind, she offers courses and visits to the farm available for the community to learn from and implement the practice in their own lives.

In my conversations with my peers, I was both not shocked and mostly disappointed in my discoveries. When questioned of the correlation between global warming and the animal agriculture industry, none of eight individuals I spoke to had a clue that they were linked. Throughout these conversations, many mentioned the melting of icecaps and the decomposition of the ozone layer as the extent of their knowledge of global warming. Though some mentioned practices like fracking for oil as a contributor to global warming the majority did not mention the connection to the animal agriculture industry. After being informed a few statistics and impacts of the animal agriculture industry on the environment, I questioned my peers on what they would do to help the problem. Not surprisingly, seven of the eight stated they would continue their dietary habits, including the consumption of animal products because of their lack of faith in our abilities to make a change and save the planet in our lifetime. One however was already vegetarian and considered the possibility of going completely plant based by eliminating dairy products. I also returned to my high school, Tappan Zee in Orangeburg, New York, to discuss the current state of our planet with my former Physics teacher Mr. Keelty. Though he agreed that

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some of the damage and warming of our planet was in part due to human interference, he did not agree that it was as severe as it is painted to be. In his response, he mentioned the Grand Solar minimum which is “a period of several successive very low Schwabe Cycles, usually coinciding with phases of climate disruption and – in the long run -cooling” (Dobler, 2018). The Grand Solar Minimum is a naturally occurring heating and cooling of the planet that happens within its own 11-year cycle. Keelty claims that global warming is questionable and the controversy could all be due to a peak and valley in temperature the planet naturally goes through.

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### Discussion

Throughout this assignment, I did not encounter many difficulties in the research process but rather difficulties in spirit and faith. In learning of the intertwined sectors and complexities of our system, I understand that there is more than boycotting and removing certain practices from our daily habits. In order to create true reform, there needs to be a complete reform of our educational, social, and political systems. The system has made it so that every sector, from the animal agriculture industry to Pharmaceuticals, Medical Industrial Complex, community jobs, health insurance companies and even our food sources are so intricately intertwined that it is almost impossible to decipher and break down. Each sector working together with the help of monopolies and legal systems disguised as private industries, has created a system in which the 1% increases in financial gain while the 99% suffer in a plethora of ways, including financial wellness, health, food efficiency, even government assistance.

For the future, I hope to dismantle the power and influence of the animal agriculture industry through the lack of support and funding given by the community through the implementing of sustainable and independent practices of that same community. I envision complete separation from the grips of these monopolies and seizing control over our bodies, food sources and money. Through the education of children and the unity of the 99%, I see the freedom of our people. It all begins with faith and the desire to do better for ourselves and the future of our planet. Like the brilliant mind of Dr. Seuss in his creation of *The Lorax* once said “Unless someone like you cares a whole awful lot, nothing is going to get better. It's not.”

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