

Animal Agriculture and Climate Change: How what you eat affects the Planet

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ABSTRACT

Raising livestock is the number one contributor to climate change because of many negative effects on our planet. Processes such as manure storage and enteric fermentation cause methane and nitrous oxide to be released and pollute our air, contributing to significant climate change. Large amounts of existing and new land and water are used in the process of animal agriculture which in turn is extremely detrimental to our planet. It was found that methane increases global warming effects 28 times more than carbon dioxide, and nitrous oxide molecules have a 265 times greater potential for global warming than carbon dioxide molecules. It is recommended that people transition towards plant-based diet for both personal and planetary benefit.

Keywords: Livestock, climate change, carbon dioxide, methane, global warming.

Subject: Environmental Science

INTRODUCTION

Our planet is ever changing; it is constantly shifting and altering itself. This is desirable because as people and places grow and change, the planet should ideally adapt. However, ocean levels and temperatures have been steadily rising along with disappearing forests. Although there are several factors which contribute to climate change, animal agriculture and the raising of livestock is the leading issue that adds to this global problem due to the variety of gasses it releases, the natural resources it consumes, and the way that it alters the environment through numerous processes. This issue has been brought into light recently, especially due to this year's COP27, a meeting about saving our dying environment that occurred the weeks of November 6-18, 2022, where they addressed how food and food systems negatively affect the environment for the first time ever demonstrating how prevalent and concerning this problem is (Starostinetskaya, 2022).

Gasses in the Atmosphere

A bacon egg and cheese sandwich holistically release 1441 grams of carbon dioxide into the atmosphere, the same emissions as of driving a gas-powered car for twelve miles (Smithers, 2018) showing how damaging it is to raise animals for food production. Raising livestock accounts for 14.5% of anthropogenic greenhouse gas emissions (Grossi, 2019), 30% of all greenhouse gas emissions (Clark, 2019) and contributes two of the most damaging greenhouse gasses; methane and nitrous oxide. Here is why these gasses are so special compared to carbon dioxide. **Methane increases global warming effects 28 times more than carbon dioxide, and nitrous oxide molecules have a 265 times greater potential for global warming than carbon dioxide molecules.** These gasses are produced from a combination of enteric fermentation, manure storage, feed production and the use of organic and inorganic fertilizers.

This raises the question of how these various processes result in these damaging fumes. Starting with enteric fermentation which is when bacteria, fungi etcetera inside the animal's stomach break down through fermentation and cause plants eaten by the animal (rumen) to become harmful fatty acids that seep through the rumen's body. Due to this, the rumen releases methane by eructation (belching), damaging the planet. Additionally, manure storage is another issue to factor in due to the organic matter and amount of nitrogen present in the manure leading to more emissions of methane and the emission of nitrous oxide (Grossi, 2019). **U.S industrial livestock farms singularly produce up to 1.37 billion tons of fecal waste annually, which is twenty times more than of the entire United States human population.** The methane that comes from these factors trap heat from the sun in our atmosphere resulting in the slow decline of our healthy planet (Kaplan, 2021). Like manure storage, feed production and the use of manure as a fertilizer dispenses copious amounts of nitrous

oxide into the air. 60% of the world's harvested global biomass goes to feed or bedding material in the livestock system. 45% of all emissions from raising livestock come from feed production and of the 45%, eggs, chicken and pork make up 60-80% of the emissions, and milk and beef make up 35-45% (Grossi, 2019). So, air pollution from animal agriculture now causes more deaths annually than emissions from coal-fired power plants (Kaplan, 2021) showing that this problem is extremely pressing and how animal agriculture is the leading contributor to climate change.

The United States Department of Agriculture and the U.S. Environmental Protection Agency allows for livestock waste regulations to be reinforced in which parameters are set according to density and location of livestock grazing areas. This ensures that the land is able to deliver "multiple-use benefits (logging, mining, farming)" for the public (Hahn, 2020). The government perpetuates the negative effects of animal agriculture by allowing for these parameters to be set, along with funding for the production of animal goods. Due to recent studies, it has come to light that "the U.S. government spends up to \$38 billion each year to subsidize the meat and dairy industries, with less than one percent of that sum allocated to aiding the production of fruits and vegetables" (Swell, 2020). Noticeably, the actions damaging the environment are being funded by the governments, showing how pervasive the problem is.

Natural Resources

Considering the standard American diet, the average American adult consumes 264 pounds of meat in one year (Kuck & Schnitkey, 2021). All varieties of foods have some sort of impact on the environment, yet the processed and unprocessed red meats have the worst environmental impact compared to any other foods. 40% of the land on Earth is used up just to farm animals, and 70% of Earth's freshwater from rivers, reservoirs and groundwater all go to animal agriculture. In fact, red meat has twice the water impact than most foods such as nuts, olive oil and even dairy. Due to the depletion of so much land and water, raising livestock consumes valuable resources and once again harms the planet.

Eutrophication is caused from an over richness of nutrients in bodies of water causing algae to excessively grow and use all the oxygen in said body of water, creating a dead zone, thus not allowing other species to survive. Acidification is another process that occurs which kills plants and animals in oceans, lakes and rivers. These processes are caused due to the poisonous gasses arising out of raising livestock (Clark, 2019).

CONCLUSION

This increasing development in animal agriculture and raising livestock has several negative effects on the planet, mostly from air pollution and natural resources being used up. Going more plant based is the recommended solution to prevent this. Straying away from foods that contain animal products will help slowly decline the need for such a vast amount of meat to be produced, as well as keep our bodies healthy. Consumption of meat and animal products long-term has been directly linked to cardiovascular disease, diabetes, and colorectal cancer (Richi et al., n.d.). Thus, avoiding meat helps both one's body and the planet.

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