

animal agriculture



Sustaining SDG 13 through food system changes

As the world continues to grow, globalize and advance, the food system pushes to maximize production through any means possible. Animal farmers have turned to factory farming in order to raise millions of livestock, generating more and more meat for consumers.

ENVIRONMENTAL IMPACT

The mass production of animals for food and other products has become a major contributor to global climate change. Typically, the percentage of annual greenhouse gas emissions from animal agriculture is cited at 18% per year, as given by the Food and Agriculture Organization of the United Nations. However, other studies, such as "Livestock and Climate Change" by Robert Goodland and Jeff Anhang, state that 18% is an underestimate, not including respiration, fish farms, land use, deforestation and updated statistics. They claim that the true percentage of global greenhouse gas emissions from livestock and their byproducts is around 51%.

While carbon dioxide (CO₂) may be the most discussed greenhouse gas, methane (CH₄) and nitrous oxide (N₂O) are more effective at trapping heat inside of the atmosphere; animals are the top producer of both of these gases according to the United States Environmental Protection Agency (EPA).

"The billions of chickens, turkeys, pigs and cows who are crammed onto factory farms produce enormous amounts of methane, both during digestion and from the acres of cesspools filled with their feces." (PETA) One pound of methane is estimated to be 84 times more effective at trapping heat inside the atmosphere, compared to carbon dioxide. Nitrous Oxide is pro-

duced from various agricultural soil management activities, such as fertilizer application, manure management and agricultural burning. N₂O has a global warming potential 298 times that of CO₂. The EPA states that the problem of animal agriculture's contribution to greenhouse gas emissions continues to worsen, as there has been a recent 68% growth in combined CH₄ and N₂O emissions from livestock manure management systems.

Aside from contributing to atmospheric greenhouse gases, animal agriculture takes a negative toll on the environment in several other ways. The meat and dairy industry is estimated to use one-third of the Earth's fresh water. "In the United States specifically, 5 percent of water use is domestic and 55 percent goes into animal agriculture. Ultimately, one hamburger uses the equivalent of 660 gallons of water. To put that in perspective, that's equal to two months of showering." (Hansel)

Hansel also states that livestock and crops grown for livestock feed, cover about 45% of earth's land. Livestock are also a catalyst for the process of desertification, which is when land is chronically degraded, causing a complete decrease in water absorption, soil productivity and nutrients in the ground. In addition to the environmental issues, desertification leads to the displacement of people when the land is no longer usable.

Finally, animal farming is a major driver of deforestation, as rainforest is cleared in order to make room to grow grain for animal feed. Animal agriculture is responsible for up to 91% of Amazon destruction, according to Cowsspiracy. This removal of rainforest increases greenhouse gases in the atmosphere, as the trees are no longer there to remove carbon dioxide and add oxygen to the air.

UN SDG 13

The United Nations has established 17 Sustainable Development Goals. Goal 13 reads: "take urgent action to combat climate change and its impact." The knowledge that climate change is a major issue began to gain more attention in the early 1990s. "Scientists had concluded that emissions of greenhouse gases such as carbon dioxide, methane and nitrous oxide were causing a gradual warming of the Earth's atmosphere and that this phenomenon would have vast implications for the environment and humankind." (Winebarger)

The UN recognizes that climate change is a major issue of today and it negatively impacts the environment in many ways. One example is in the oceans. Excess greenhouse gases in the atmosphere and warmer temperatures brought on by climate change cause the process of ocean acidification. This increase in acidity is changing the habitat of the ecosystem and impairs the ocean's ability to regulate climate, absorb greenhouse gases and provide quality water. These changes impact marine animals and the food chain, causing many problems for the billions of humans that depend on the ocean.

Not only does climate change negatively impact the oceans, but it takes a toll on the air as well. Climate change causes shifting levels of air pollutants and ground level ozone; this can lead to poor air quality, which negatively affects human respiratory and cardiovascular systems. Unclean air also causes allergic sensitization and asthma episodes, limiting human health and productivity (GlobalChange.gov: US Global Change Research Program).

The oceans and air pollution are just two examples of why climate change is a problem recognized by the UN. If left unchanged, the issues will only continue to worsen, potentially leaving humans with a world that can no longer provide for us.



A big reason for optimism about the end of animal farming is that it doesn't have to be the end of meat.

-Jacy Reese, The End of Animal Farming



SOLUTIONS

The problem of animal agriculture is largely ignored by the United States federal government. "The Environmental Protection Agency (EPA) is responsible for the regulation of factory farms, however, it does little to prevent, limit and rectify the toxic emissions and excessive wastes of the livestock industry." (Kuper) The US continues to heavily subsidize animal agriculture through legislation like the Farm Bill, providing over \$4.8 billion in subsidies to support the dairy industry alone (about \$38 billion across all animal agriculture industries.) This support occurs during stated commitments to climate change agreements, such as the United Nations Framework Convention on Climate Change (UNFCCC): an international environmental treaty that provides a framework for addressing environmental problems and works to stabilize greenhouse gas emissions, and other agreements.

The animal agriculture problem is currently handled by individuals who make the effort to eliminate their impact. "An individual following a plant based diet produces the equivalent of 50% less carbon dioxide, uses 1/11th oil, 1/13th water and 1/18th land compared to an average American meat consumer for their food." (Hansel) To truly make a difference and bring the world closer to the UN goal of solving the climate crisis, the change has to go from preaching individuals to a switch in the industry.

Jacy Reese, a writer, social scientist and the co-founder of Sentience Institute: a research company for new solutions, wrote "The End of Animal Farming" and explained two ways to engineer meat. The first way, creating plant based solutions using fat, water, protein and trace minerals, has already begun under companies like Beyond Foods.

He also discusses products that are actual meat, but come without the ethical and environmental concerns of the meat and dairy industries. This technology takes a small swab of cells from a living animal and transfers them to a cell cultivator, which mimics the growing process inside of an animal. This new substitute, called Clean Meat, allows the world to eat the same meat and dairy products that everyone knows and loves, without the greenhouse gas emissions and other environmental damage that is the result of mass factory farming.

Adopting these solutions would increase the sustainability of the global food system, feed more people and greatly improve the environment, bringing the UN closer to meeting the climate change goal that is set for the year 2030.



Scan this QR code to learn more about Clean Meat. Information given by the Good Food Institute.