# Animal Agriculture & Environment

Although many people do not realize it, animal agriculture and fishing are actually having huge effects on our planet. They are the leading reasons for deforestation of the Amazon, are causing dead zones in oceans, are bringing fish towards extinction, and depending on which authority you ask, are either one of the, or the leading cause of greenhouse gas emissions. Despite the overwhelming amount of reputable data on the issue, it goes largely ignored by organizations and people seeking to help the increasingly urgent issue of climate change that our world is facing. In writing this, I hope to educate anyone reading this on the effects of animal agriculture on our environment at a base level and additionally give them sources from which they can expand their knowledge on the issue even more.

## Greenhouse Gases

When the Food and Agriculture Organization of the United Nations analyzed the effects of animal agriculture on the environment, it stated that "With emissions estimated at 7.1 gigatonnes ($10^9$ tonnes) CO2-eq per annum, representing 14.5 percent of human-induced GHG (greenhouse gas) emissions, the livestock sector plays an important role in climate change."[1]. With the UN's 14.5 percent estimate, the animal agriculture industry would already be one of the leading factors of climate change in the world, however, estimates by other organizations go even further. For example, in a paper by The Worldwatch Institute, an environmental research organization, they point out that in the estimate by the UN many things were left out, such as the breathing that the livestock do. Their analysis and number crunching ultimately ends up with an estimate of less than or equal to 51 percent of human emissions being caused by animal agriculture[2]. This estimate leaves animal agriculture as the largest contributor to human emissions by far. Regardless of who you want to believe, this makes the animal agriculture sector a huge issue to confront in our journey towards a more sustainable future, one that depressingly goes unknown and undiscussed by many people, decision makers and concerned citizens alike.

Now that you know how bad animal agriculture is in this regard, let's compare this to the alternative, veganism. In an analysis of vegans, vegetarians and meat eaters' diets, a group of scientists separated the 65,000 participants into 6 groups "high" meat eaters 100≥g/day (This is actually the average meat consumption in the USA[3]), "medium" meat eaters 50-99 g/day, "low" meat eaters 50 < g/day, fish eaters (vegetarian besides fish), vegetarians & vegans. Based on the foods that each group reported eating, the researchers calculated the emissions of each of their diets per 'daily' 2000 calorie portion. Their results can be found in this chart[4]:

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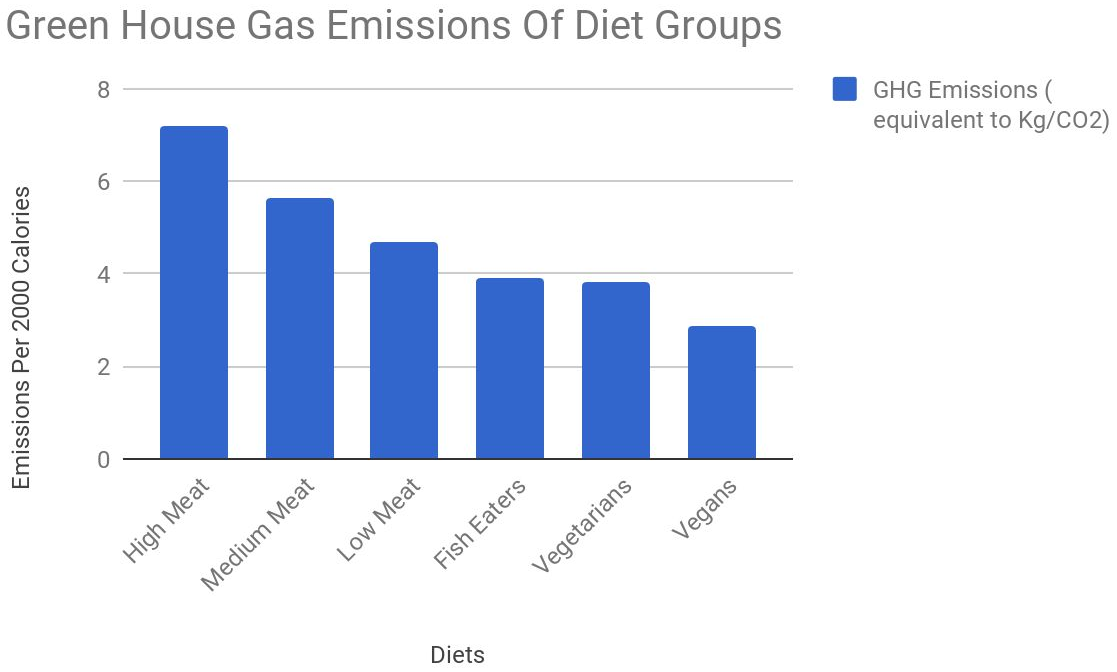
[1] Gerber, P.J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., Falcucci, A. & Tempio, G. 2013. Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities. Food and Agriculture Organization of the United Nations (FAO), Rome. Link

[2] Goodland, Robert, and Jeff Anhang "Livestock and Climate Change." PDF file, Dec. 2009. Link

[3] Brunker, Mike, and Martha C. White. "The Big Bucks of Bacon: American Meat Industry By the Numbers." *NBCNews.com*, NBCUniversal News Group, 26 Oct. 2015, Link.

[4] Scarborough, P., Appleby, P.N., Mizdrak, A. et al. Climatic Change (2014) 125: 179. Link




As you can see, the daily emissions of a person steadily decrease as they cut more and more animal products from their diet, ultimately leaving the vegan population at a figure two times lower than the high meat one.

**Other Ecological Impacts**

Animal Agriculture also contributes to the environment in more ways than just adding greenhouse gases. From drastically affecting the ocean ecosystem through overfishing[5], to being responsible for a huge portion of the deforestation of the rainforest[6], and even just taking up large amounts of land that could otherwise be used for more environmentally friendly practices[7]. The animal agriculture industry has a huge effect on the ecosystem of the world as a whole.

The Amazon

The Amazon Rainforest is an important part of global ecology, taking in huge amounts of greenhouse gases as a carbon sink and possessing some of the most biologically diverse life in the world. However, due to deforestation the Amazon is rapidly shrinking. When The World Bank decided to look into the causes of deforestation in the amazon, they found that the results

[5] Myers RA, Worm B. Rapid worldwide depletion of predatory fish communities. Link

[6] "Margulis, Sergio. 2004. Causes of Deforestation of the Brazilian Amazon. World Bank Working Paper;No. 22. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/15060 License: CC BY 3.0 IGO." Link

[7] Goodland, Robert, and Jeff Anhang "Livestock and Climate Change." PDF file, Dec. 2009. Link

overwhelmingly showed that cattle ranching was the main cause "...recent deforestation in significant parts of the [Amazon] region is basically caused by medium- and large-scale cattle ranching". The cattle ranching industry has grown so much in the region that at the time of publishing, cattle ranching took up approximately 75 percent of the areas deforested in the Amazon.[8]

## Space Use

Agriculture takes up a lot of space, space that could be used for different things, such as solar panels, windmills, or even the natural wildlife that would usually be in the area. Obviously some of this agriculture needs to stay in order to feed the human population, but not nearly the amount that is currently being used. In order to raise animals for humans to eat, they need to be fed as well. The Worldwatch Institute estimates that 33 percent of farmable land across the world is used to raise crops for animals and 26 percent of general land in the world is used for grazing them[9]. Not only are these huge areas of the world not being used for anything sustainable, but are actively contributing to further pollution, degradation and erosion of the environment.

## Dead Zones

One of the other effects of animal agriculture, expressing itself both in the feeding of the animals itself and general plant agriculture, (most of which is used to feed animals regardless[10]) are the dead zones forming on coastlines around the world. These 'dead zones' are areas where large bacteria blooms happen, causing all of the sea life below them to die off. This leads to both large economic and ecological effects.[11] These dead zones are caused by nutrient runoff that can be from a multitude of things. However, both modern nitrogen fertilizer fueled plant agriculture, which as I have previously covered we would need far less of if we did not need to feed the additional livestock animals and animal agriculture and waste products themselves are both huge contributors[12][13].

## Fish

Finally, the only animal food that isn't always agricultural, fishing, still creates tremendous strain on the ocean ecosystem, driving many species near to extinction and decimating the

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[8] "Margulis, Sergio. 2004. Causes of Deforestation of the Brazilian Amazon. World Bank Working Paper;No. 22. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/15060 License: CC BY 3.0 IGO." Link

[9] Goodland, Robert, and Jeff Anhang "Livestock and Climate Change." PDF file, Dec. 2009. Link

[10] Ibid

[11] "Nutrient Pollution." *Ocean Health Index*, www.oceanhealthindex.org/methodology/components/nutrient-pollution. Accessed 3 Apr. 2018. Link

[12] Brooks, Cassandra. "Meat's Environmental Impact." *Stanford Woods Institute for the Environment*, 25 July 2011, woods.stanford.edu/news-events/news/meats-environmental-impact. Accessed 17 Apr. 2018. Link

[13] *Clean Coastal Waters: Understanding and Reducing the Effects of Nutrient Pollution*. National Academies Press. *National Academies Press*, www.nap.edu/read/9812. Accessed 3 Apr. 2018. Link

environment. In fact, modern industrialized fishing has led to a 90% decrease in the world's top predator fish such as swordfish and tuna.[14] Additionally, according to a report by the United Nations Food and Agriculture Organization, 75% of the world's fisheries are either at their limits or being overfished.[15] Additionally, here are some other effects of fishing that although I heard in a lecture made by Bruce Monger, a Cornell professor, I do not have direct citations for. When fishing, upwards of 70% of caught marine life in certain types of fishing such as trawling is not the target species and is simply discarded, dead. Other forms of fishing, such as longline fishing, ultimately has ended up putting many non-target species such as predatory birds and sharks into population collapse. Finally, aquaculture, or farmed fish, depending on the species, such as salmon are carnivorous, and because of this, still rely on catching of smaller, prey species to survive. Even in cases where the fish are not carnivores, such as tilapia, also contribute to algal blooms and dead zones .

**Social Environment**

Although this probably isn't the environment you thought I was going to talk about, it is still certainly worth considering. When researching for this paper, I came across a lot of data on the effects of Slaughterhouse work on the human workers in them, and their surrounding communities. From increasing domestic violence rates, increasing drug and alcohol abuse, giving people PTSD and being the most physically dangerous occupation in the US, the effect this industry has on the people and the communities that do it is tremendous.[16]

Slaughterhouse work is harrowing and brutal, often-times requiring people to commit cruel acts that they would otherwise never do. Over time, this work slowly changes people and permanently psychologically damages them, often giving them a form of PTSD called PITS (Perpetration Induced Traumatic Stress), caused by the perpetration of inhumane or terrible acts. This condition is characterized by "symptoms as including drug and alcohol abuse, anxiety, panic, depression, increased paranoia, a sense of disintegration, dissociation or amnesia, which are incorporated into the "psychological consequences" of the act of killing"[17]. Although this correlation has not yet been thoroughly studied, there is much anecdotal evidence that points towards workers having this condition such as drug and alcohol abuse being more prevalent in Slaughterhouse workers, cases of workers being taken to mental institutions for recurring violent dreams and other things characteristic of the condition such as "doubling" (where the sufferer will essentially create two versions of themselves, one that commits the

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[14] Myers RA, Worm B. Rapid worldwide depletion of predatory fish communities. Link
[15] Food & Agriculture Organization of the United States. (2010). The state of world fisheries and aquaculture. Retrieved from: http://www.fao.org/docrep/013/i1820e/i1820e00.htm. Link
[16] Lebwohl, Michael. Weblog post. *Yale Global Health Review*, Yale, 25 Jan. 2016, yaleglobalhealthreview.com/2016/01/25/a-call-to-action-psychological-harm-in-slaughterhouse-workers/. Accessed 30 Mar. 2018. Link
[17] Dillard, Jennifer. "A Slaughterhouse Nightmare: Psychological Harm Suffered by Slaughterhouse Employees and the Possibility of Redress through Legal Reform." PDF file, Sept. 2007. Link

terrible action and the other that is still a good person that) that can be seen when analyzing people talking about their work.[18]

Finally, whether due to the PITS or other conditions present in slaughterhouses, crime rates generally, and more specifically violent and sexual types have been shown to rise in slaughterhouse communities, with the violent crime rise being largely domestic abuse. This is even true when controlling for other possible factors, such as population growth or unemployment and when comparing to other similarly menial factory work with similar pay.[19]

[18] Ibid

[19] Slaughterhouses and Increased Crime Rates Amy Fitzgerald-Linda Kalof-Thomas Dietz - Organization & Environment - 2009. Link