Going Green: Livestock's Gas-Powered Potential

Trevor M. Bradford

> Agriculture is one of the biggest causes of greenhouse gases in the atmosphere. Cars? Planes? Trains? Nope. Cow Farts.
>
> – Zazie Beetz

There is little argument over whether the food industry as a whole is harmful to the environment. Rampant use of pesticides infiltrates soil, creating non-sustainable, food-growing land. Stripping crops from the soil releases metric tons of carbon dioxide into the air, while methane and nitrous oxide produced from livestock agriculture contribute more to greenhouse emissions than all the cars in the world. While there has been some traction on the topic of agricultural reform with regards to produce, there has been little to no movement in cleaning up the damage done to the atmosphere from livestock agriculture. In an essay written by Anna Lappé, NASA scientist Cynthia Rosenzweig was quoted as saying, "If we don't drastically reduce greenhouse gas emissions by 2080, farming in New York could feel like farming in Georgia" (Lappé 702) because temperatures will have risen so drastically. By utilizing technologies already available, we can transform waste produced by livestock into biogas, a renewable resource that can be used to power our homes and infrastructure while reducing greenhouse gas emissions. The fact that our farmers aren't doing this already is a failure of the entire industry. To put it bluntly, our current model for producing food, the very sustenance our species grows to survive, is directly contributing to reshaping our planet, and not in a way that's positive for humankind.

Some have taken it upon themselves to attempt a grassroots campaign to reform the food industry. Michael Pollan, a professor at the University of California in Berkley, suggests that if more people were to make the small change to just grow a small garden it would create "a chain reaction of behavioral change" (Pollan 719). In other words, if more people led by example, it could potentially create a ripple effect throughout communities. Not only would more people see and emulate the planting of a garden, but more folks would be leading healthier lives by eating their own produce, and would be more appreciative of what goes into growing food. By proxy, this would eliminate so much demand for industrial farming, therefore reducing the impact to the environment. McKay Jenkins takes a more reasoned approach to the conversation in his essay on the sustainability of genetically modified organisms (GMOs). He holds up Jenny Schmidt's farm in Maryland as an example of regenerative farming. According to Jenkins and Schmidt, this kind of farming utilizes GMO seeds for planting and minimizes the use of pesticides needed for crop growth,

resulting in farmland that does not need to be stripped, which severely lessens the amount of carbon dioxide produced (Jenkins).

While reduction in emissions as a result of producing vegetation is vitally important, it doesn't capture the entire picture of agriculture's impact on global warming. The other half of producing food for consumption is the livestock industry. According to Lappé, "the sector is responsible for 37 percent of methane and 65 percent of nitrous oxide," released into the air in the United States (Lappé 707). While carbon may be the most proliferated greenhouse gas, nitrous oxide and methane are much more potent. "For example, one ton of nitrous oxide – emitted by agricultural processes including the use of nitrogen fertilizers in crop production – is equivalent to nearly 300 tons of carbon dioxide. Methane is approximately 30 times more potent in its ability to absorb and trap heat in the atmosphere than carbon dioxide" (Bridgeman para 15 & 16). In the past, livestock farming was nearly a 0% impact due to its very nature; cattle would graze on grass, aerate the soil with their hooves, and naturally fertilize the soil with their manure. Nowadays, in an effort to mass produce dairy, beef, chicken, and pork, massive farms hold livestock in pens as they are fed copious amounts of grain and corn, which takes away all the environmental positives of raising livestock. The manure is collected into huge tanks where it is collected in such vast amounts that it is unable to oxidize and releases enormous volumes of methane and nitrous oxide into the air (Lappé 707).

With the diets of most Americans in some way, shape, or form dependent on the livestock industry, there is little chance in scaling back on production. One thing that can be done however, is to utilize most of the gases produced by these livestock farms in a manner that would limit the amount released into the air while producing a new source of renewable biogas energy. According to the fact sheet, *Biogas: Converting Waste to Energy*, "After biogas is captured, it can produce heat and electricity for use in engines, micro turbines, and fuel cells. Biogas can also be upgraded into biomethane, also called renewable natural gas or RNG, and injected into natural gas pipelines or used as a vehicle fuel" (Tanigawa). As of October 2018, the United States was only utilizing 16% of its capability to produce biogas from livestock waste. In addition, maximizing our ability to generate biogas would reducean amount of atmospheric emissions equivalent to that produced by 11 million vehicles. Furthermore, it would "create 335,000 temporary construction jobs and 23,000 permanent jobs" (Tanigawa).

With all the benefits and very few drawbacks, one might ask themselves, "How is this not a mainstream practice yet?" There are two simple answers. First, "For facilities treating organic waste for energy production, resistance from the local population has been identified as the biggest problem when it comes to siting a biogas plant" (Bourdin et al. 1656). According to Bourdin et al, many people support

renewable energy initiatives on a national and global level, however, they tend to adopt a "not in my backyard" mentality when those changes happen locally. Second, there is little to no incentive, other than a moral obligation to the environment, for livestock farmers to spend money on biogas systems. A search through 2014's *Guide to U.S. Environmental Policy* reveals zero mentions of biogas or methane in the entire report. Without the promise of revenue being generated or some sort of legal requirement, farmers aren't going to voluntarily take on the added burden of financing agricultural reform. If U.S. citizens are serious about reducing greenhouse gas emissions and global warming, then they need to start reaching out to their elected officials. Our government has a responsibility to form laws and policies that make it attractive to responsibly and safely dispose of gases generated by the industrial agricultural industry as well as find safe sources of renewable energy. It is imperative that our representatives become involved in a top-down approach to incentivize greener practices in our livestock production, just like they have been doing in traditional produce-generating farms. This will incentivize our agriculture industry to continue to produce food products while simultaneously correcting the industries' impacts on our environment.

Works Cited

Bourdin, Sébastien, et al. "Understanding the Problems of Biogas Production Deployment in Different Regions: Territorial Governance Matters Too." *Journal of Environmental Planning & Management, vol. 63, no. 9*, Aug. 2020, pp. 1655–1673. EBSCOhost, doi:10.1080/09640568.2019.1680158.

Bridgeman, Laura. "Animal Agriculture and Its Negative Impact on Climate Change." Sentient Media, 11 Dec. 2020, sentientmedia.org/animal agriculture-climate-change/. Accessed 22 April 2021.

Jenkins, McKay. "Can GMOs Be Sustainable?" *From Inquiry to Academic Writing: A text and Reader, 4th ed.*, edited by Stuart Green and April Lidinsky, Bedford/St. Martin's, 2018, pgs. 722-731.

Lappé, Anna. "The Climate Crisis at the End of Our Fork." *From Inquiry to Academic Writing: A Text and Reader, 4th ed.*, edited by Stuart Green and April Lidinsky, Bedford/St. Martin's, 2018, pgs. 702-714.

Pollan, Michael. "Why Bother?" *From Inquiry to Academic Writing: A text and Reader, 4th ed.*, edited by Stuart Green and April Lidinsky, Bedford/St. Martin's, 2018, pgs. 715-721.

Sally K. Fairfax, and Edmund Russell. *Guide to U.S. Environmental Policy*. CQ Press, 2014.

EBSCOhost,search.ebscohost.com/login.aspx?direct=true&db=e900xww&AN=862170&authtype=sso&custid=083-900&site=eds-live&scope=site.

Tanigawa, Sara. "Fact Sheet: Biogas: Converting Waste to Energy." Edited by Jessie Stolark, EESI, 3 Oct. 2017, www.eesi.org/papers/view/fact-sheet biogasconverting-waste-to-energy. Accessed 16 April 2021.