

March 11, 2024

COWS AND METHANE -THE CYCLE OF LIFE

Those of us raising cattle are upset at the movement blaming cows for global warming, especially since this is not supported by reality. The role of animal agriculture in carbon dioxide and, particularly methane emissions, is complex. Cows, however, cannot be singled out as the guilty party.

All animals produce and contribute to global atmospheric carbon dioxide. We, and the other animals, would not be alive if we did not. All animals also emit methane but those that subsist on grass and other forms of cellulose produce more. While it is in the atmosphere, methane absorbs more of the sun's energy than does carbon dioxide, thereby causing more warming. Ruminant animals produce more than rodents, omnivores and carnivores. Many insects, particularly termites and dung beetles, are prodigious sources of methane.

Animals contribute about 15% of the world's atmospheric methane. Rice paddies produce about 11%. The largest source includes wetlands, lakes, and rivers for about 20% to 30% of the total. The melting of the arctic tundra is also adding methane but there does not seem to be an agreed upon figure as to how much. Oceans too produce methane, particularly the coastal areas where most of the marine plants grow. These are all what you might term "natural" sources of methane.

However, twenty three percent (23%) of the methane is said to come from leaking oil, and gas wells, as well as coal mines, and biomass facilities. These "un-natural" sources of methane seem to be just a guess, which is why a satellite was just launched to map methane leaks. Plugging wells would be very helpful because these sources add the only "new" methane to the atmosphere.

We don't yet know how much methane comes from leaking oil and gas wells nor do we know for sure how much methane comes from the world's wetlands, oceans, and tundra. We also don't really know how much methane is being produced by cows and other animals. Chances are that the people who blame cows are not in favor of draining the world's swamps. An inconsistent position.

Somewhere between 2% and 12% of the energy in a cow's diet goes up as methane, which is a large range, indicating a lot of scientific uncertainty. This undoubtedly is because cattle are raised in a wide variety of circumstances. At one end are the 1700-pound Holstein dairy cows, constantly munching away on a diet of corn, silage, and alfalfa. Among the less advantaged are little African cattle with horns as big as their bodies wandering around looking for something to eat in the Sahara Desert. Clearly these two cows are not emitting the same amount of methane. It is doubtful that anyone knows what the actual average is across the globe because of these widely different types of cattle, raised under very different management and environments.

If 2% to 12% of the feed we give our cattle is going up as methane, it would be to our advantage to do something about it because this costs money. Some types of red algae and a feed additive called Bovaer can reduce the amount of energy lost as methane. Bovaer is not yet licensed in the USA, so we don't know how effective it is or how much it will cost. But who would not like to increase their feed efficiency by a few percent points?

However, it is not that easy. It never is. Methane is produced by methanogenic microorganisms that are found everywhere in the world. These microorganisms are not well understood because they do not grow easily in petri dishes. The thing is, methanogens play a vital role in the digestion of cellulose in the cow's rumen. Even though they cause a net loss of the feed's energy, they create the proper environment for the other microorganisms to break down the nutrition locked up in the cow's feed.

If Bovear or red algae proves to be a cost-effective way to improve feed efficiency and at the same time reduce methane emissions, that would be a good thing for everyone. But if that does not prove to be the case, we are still left with the question of would reducing the number of cattle actually reduce the methane in the atmosphere?

Perhaps some people imagine that if cows are not wandering around Montana's hills consuming grass, that the rangeland would just go into some kind of hibernation. Much like a diesel engine that is idling, not doing much of anything but not consuming a lot of fuel either. Nature does not work that way. If there is a food source available, some kind of organism will move in to consume it. The quickest to respond would be insects, followed by rodents, and finally wild ruminants. Then too, we would probably experience more range fires with all of the destruction and pollution that entails.

In the long run there would be no reduction in methane. Animal and other sources of "natural" methane have always been part of a global cycle. It takes about twelve years for a molecule of methane in the atmosphere to be reduced to carbon dioxide and water. The carbon dioxide in turn is taken in by plants to create more starch and cellulose. It is a natural cycle - the cycle of life.

All of the "natural" sources of methane, including wetlands and animals, are pretty much fixed as to the amount of methane produced. On a global basis the popular concern is more as to preventing the loss of wetlands rather than worrying that they are increasing and making more methane. In the US, the cattle herd has been going down from 99 million in 1999 to 87 million today. Worldwide, cattle numbers have decreased from just over one billion in 2012 to 942 million now.

Since wetlands across the globe are not increasing in acreage and grass consuming animals are not more numerous than before. And as mentioned above, if a cow or sheep is not grazing the hillside - a deer, antelope, elk, or bison will. Methane emissions are, therefore, not a function of the number of livestock, it is a function of the grass and the other vegetation available to be consumed, digested, or alternatively, rot in the bottom of a swamp.

This cycle, inevitably, releases carbon dioxide and methane into the atmosphere. Methane from natural sources is not increasing as to the total amount because it has always been with us. It is a function of the world's capacity to grow vegetation. It is part of the cycle of life.

Cattle producers don't have to be on the back foot confronting those who are anti-cows. We should just tell them to go back to school, and this time pay attention in biology class.

Gilles Stockton
Grass Range, Montana

Short version

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