Background

To what degree does human activity on Earth lead to climate change? Although the answer to that question is unknown, there is growing public and governmental concern that greenhouse gas (GHG) emissions should be curtailed to reduce future effects of increasing global temperatures and climate change.

Many large U.S. and foreign companies have already started that process and Congress and the Obama Administration are likely to implement policies to restrict emissions from major industrial sources of GHGs. How such policies might affect the meat and livestock industries is important.

Carbon dioxide, methane, and nitrous oxide comprise almost 98 percent of GHGs in the atmosphere, all of which are important byproducts of human activity, including animal agriculture.

• **Carbon dioxide** ($CO_2$) is most prevalent GHG (85.4 percent). It enters the atmosphere through burning fossil fuels and solid waste, forest fires, manufacturing, and from the breathing of humans and animals. Carbon dioxide can be removed from the atmosphere by “sequestration” — the process by which carbon dioxide is used (“fixed”) by plants as part of the carbon cycle.

• **Methane** ($CH_4$) is the second most common GHG (8.2 percent), and is 31 times more potent as a GHG than $CO_2$. It is emitted during the production and transport of coal, natural gas, and oil. Methane emissions also come from livestock and other agricultural practices and by the decay of organic waste in municipal solid waste landfills.

• The third most common (4.4 percent) greenhouse gas is **nitrous oxide** ($N_2O$), which is 310 times more potent than $CO_2$. $N_2O$ is emitted during the combustion of fossil fuels and solid waste, as well as during certain agricultural and industrial activities.

Animal Agriculture’s Role in GHG Emissions

Despite claims to the contrary, animal agriculture and meat consumption contribute only a small part of U.S. GHG production. According to EPA, in 2007 only 2.8 percent of U.S. GHG emissions came from animal agriculture through a process called enteric fermentation (the digestion of feed by ruminant animals) and through manure management. Since 1990, animal agriculture’s contribution to greenhouse gas emissions has remained nearly constant. This is impressive considering U.S. increases in meat production of almost 50 percent, milk production of 16 percent, and egg production of almost 33 percent. The fact that GHG emissions from U.S. animal agriculture have remained relatively constant while protein production has increased dramatically reflects improved feed efficiencies, better manure management strategies and efficient use of cropland.
How much does animal agriculture contribute to GHG production? If we take a closer look at the top three GHG emissions in 2007, carbon dioxide represents 85.4 percent of all GHG emissions, with 94 percent resulting from the combustion of fossil fuels. Methane production represents 8.2 percent of all GHG emissions, of which enteric fermentation and manure management combined represent 31.3 percent of total CH₄ production. Nitrous oxide production represents approximately 4.4 percent of all GHG emissions, of which only 4.7 percent is attributable to manure management.

In Perspective:

• Today’s American farmer feeds about 144 people worldwide.
• Approximately 85 percent of U.S. grazing lands are unsuitable for crop production. Grazing animals on this land more than doubles the area that can be used to produce food.
• Meat and poultry are an essential part of a balanced diet because they are nutrient dense and are considered “complete proteins,” meaning that they contain all nine of the essential amino acids needed by humans. The current USDA recommendation for the consumption of protein is 63 grams a day for adult men and 50 grams a day for adult women.
• A 2006 FAO report estimated total GHG emissions resulting from animal agriculture around the world. Attempts to apply these global numbers to the U.S. are misleading because the vast majority of global GHG emissions attributed to livestock production result from deforestation and converting rain forests and other lands to grow crops or pasture. Such changes do not occur in the U.S., which has seen an increase in the total acreage of forested land over the last several decades — even while total agricultural production has increased.
• Total U.S. dairy farmer GHG emissions decreased by about 32 percent between 1944 and 2007 — even while milk production was up by almost 60 percent. GHG emissions per dairy cow dropped by almost 66 percent.
• All of animal agriculture’s GHG emissions from 1990 to 2005 have remained nearly constant, increasing by only about 3.5 percent since 1990. During the same period total U.S. meat production has increased 50 percent, milk production has increased almost 20 percent, and egg production has increased about 32 percent.

Conclusion

GHG and climate change are important considerations for our industry and society at large. With so much uncertainty built into these topics, it’s important that we apply facts when we can. The data show that GHG contributions of U.S. animal agriculture are far less than some reports have suggested.

The fact that emissions have remained the same while industry production has increased shows that livestock and meat producers have taken responsible steps to provide an abundant and affordable meat supply while still protecting the environment.

Helpful Links

American Meat Institute
http://www.meatami.com
http://www.meatsafety.org