NRCS
Natural Resources
Conservation Service

United States Department of Agriculture
Natural Resources Conservation Service

Fact Sheet -- Air Quality and Atmospheric Change

Air Quality and Atmospheric
Change National Technology
Development Team

Greenhouse Gases and Animal Operations

What are Greenhouse Gases (GHGs)?

Greenhouse gases (GHGs) are compounds in the atmosphere that capture and retain energy reflected from the earth's surface. They lead to a warming of the atmosphere that is popularly called the "greenhouse effect." Carbon dioxide, methane, and nitrous oxide are the primary compounds associated with GHGs in agricultural operations. The NRCS Air Quality and Atmospheric Change (AQAC) National Technology Development Team is primarily interested in the atmospheric change effects of GHGs, as well as agricultural opportunities for storing or sequestering carbon.

Where are GHGs an Issue?

GHGs are typically a global issue. Greater emphasis on addressing GHGs is likely to occur in areas that have developed regulations or initiatives to mitigate GHG emissions, or in areas and operations that participate in carbon credit trading.

How Do Animal Operations Affect GHGs?

Animal operations can influence GHGs in a variety of ways, including:

- Biological organisms (including animals) emit carbon dioxide and methane naturally. Ruminants, such as cattle and sheep, produce more intestinal methane than non-ruminants.
- The breakdown or decomposition of biological materials such as manure, feed, or mortalities, can produce carbon dioxide (as a natural by-product of the breakdown/decomposition process), methane (under anaerobic conditions), and nitrous oxides (mainly from the nitrification/denitrification processes).
- Combustion in on-farm equipment or the burning of biological material also produces carbon dioxide as a natural by-product.

What Can I Do?

Many common practices and management activities can help reduce the likelihood of GHG impacts from animal operations. The following suggestions are not all-inclusive but offer some options that are available for managing GHG emissions. Talk with your NRCS conservation professional about what specifically will work best on your land.

Concentrated Operations

- Maintain appropriate cleaning techniques for spilled feed, bedding, etc.
- Maintain appropriate moisture content in and on open lot surfaces.
- Utilize manure management techniques that minimize, recover, or control emitted gases.
- Utilize feed management or feed additives to minimize intestinal GHG production and manure production.

Grazed Operations

- Use prescribed grazing and/or range management to minimize manure accumulation, reduce burning requirements, and sequester carbon in soils.
- Implement alternatives to the burning of excess biomass on rangelands through prescribed grazing or the development of biofuels.
- When rangeland burning is necessary, promote an efficient and effective burn through the development and implementation of prescribed burn and smoke management plans.

Miscellaneous

- Avoid spilling feed or manure, and clean materials up quickly when spills do occur.
- Utilize biofuels instead of fossil fuels.
- Replace older, less efficient combustion sources or engines with more efficient or alternative fuel combustion or electric heating/power sources.

For More Information

NRCS is currently developing guidance and conservation practice standards for addressing GHGs coming from animal operations. For more information, contact the Air Quality and Atmospheric Change National Technology Development Team (http://www.airquality.nrcs.usda.gov/) at the West National Technology Support Center in Portland, Oregon. (Primary contact: Greg Zwicke, 503-273-2434, greg.zwicke@por.usda.gov)

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