

Greenhouse Gas, Climate Change, and Dairy Farming in New Mexico

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Greenhouse gas (GHG) are produced naturally in the environment and have resided in the atmosphere for million of years. These gases contribute to maintain the Earth warm enough to support life as we know it. However, during the last century, human activities such as burning fossil fuels, intensive agriculture, and household activities have dramatically increased the concentration of these gases in the atmosphere contributing to the global warming.

How these affect climate change and why this is a problem

GHG trap heat in the Earth's atmosphere, which contributes toward global warming, which may result in unpredictable and potentially severe changes to the Earth's climate with unknown impacts on weather patterns, sea level, cropland production, and national economies.

Types of GHG, definitions, and conversions

There are essentially three types of GHG of concern: Carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Carbon dioxide is the most prevalent in terms of quantity in the atmosphere. Scientists have studied the global warming potential (GWP) of these three substances. With respect to carbon dioxide, methane has 21, and nitrous oxide has 310 times higher GWP. Consequently, to estimate the overall GWP of a industry, these factors are used to convert methane and nitrous oxide to carbon dioxide equivalents (CO₂e).

How much is being produced in New Mexico

Analysis for year 2000 suggested New Mexico GHG emissions were 83 million metric tons (MMt) CO₂e, which equals to 1.2% the total US GHG emissions.

How much GHG dairy cattle produce in New Mexico

Dairy cattle produce these three compounds from enteric fermentation and from manure decomposition. According to studies in California, an adult dairy cow produces 10,500 kg of CO₂e per year. So, with 300,000 cows in New Mexico in year 2000, the dairy industry may have produced 3.5 MMt CO₂e or only 4.2% the total GHG for the state.

In addition, dairy farmers in New Mexico have already in place several management practices conducive to decrease GHG emissions: Improved diets to decrease ruminant methane, enhanced manure management to decrease nitrous dioxide, and farming practices to sequester carbon dioxide. Common practices in dairy crop farming are reduced tilling along with no chemical fertilization, which are highly recommended practices to reduce GHG emissions.

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