

Efforts to curb climate change require greater emphasis on livestock

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While climate change negotiators struggle to agree on ways to reduce carbon dioxide (CO₂) emissions, they have paid inadequate attention to other greenhouse gases associated with livestock, according to an analysis by an international research team.

A reduction in non-CO₂ greenhouse gases will be required to abate [climate change](#), the researchers said. Cutting releases of methane and nitrous oxide, two gases that pound-for-pound trap more heat than does CO₂, should be considered alongside the challenge of reducing fossil fuel use.

The researchers' analysis, "Ruminants, Climate Change, and Climate Policy," is being published today as an opinion commentary in *Nature Climate Change*, a professional journal.

William Ripple, a professor in the College of Forestry at Oregon State University, and co-authors from Scotland, Austria, Australia and the United States, reached their conclusions on the basis of a synthesis of scientific knowledge on greenhouse gases, climate change and food and environmental issues. They drew from a variety of sources including the Food and Agricultural Organization, the United Nations Framework Convention on Climate Change (UNFCCC) and recent peer-reviewed publications.

"Because the Earth's climate may be near a tipping point to major climate change, multiple approaches are needed for mitigation," said

Ripple. "We clearly need to reduce the burning of fossil fuels to cut CO₂ emissions. But that addresses only part of the problem. We also need to reduce non-CO₂ [greenhouse gases](#) to lessen the likelihood of us crossing this climatic threshold."

Methane is the second most abundant [greenhouse gas](#), and a recent report estimated that in the United States methane releases from all sources could be much higher than previously thought. Among the largest human-related sources of methane are ruminant animals (cattle, sheep, goats, and buffalo) and fossil fuel extraction and combustion.

One of the most effective ways to cut methane, the researchers wrote, is to reduce global populations of ruminant livestock, especially cattle. Ruminants are estimated to comprise the largest single human-related source of methane. By reflecting the latest estimates of [greenhouse gas emissions](#) on the basis of a life-cycle or a "farm to fork" analysis, the researchers observed that greenhouse gas emissions from cattle and sheep production are 19 to 48 times higher (on the basis of pounds of food produced) than they are from producing protein-rich plant foods such as beans, grains, or soy products.

Unlike non-ruminant animals such as pigs and poultry, ruminants produce copious amounts of methane in their digestive systems. Although CO₂ is the most abundant greenhouse gas, the international community could achieve a more rapid reduction in the causes of global warming by lowering methane emissions through a reduction in the number of ruminants, the authors said, than by cutting CO₂ alone.

The authors also observed that, on a global basis, ruminant livestock production is having a growing impact on the environment:

- Globally, the number of ruminant livestock has increased by 50 percent in the last 50 years, and there are now about 3.6 billion

ruminant livestock on the planet.

- About a quarter of the Earth's land area is dedicated to grazing, mostly for cattle, sheep and goats.
- A third of all arable land is used to grow feed crops for livestock.

In addition to reducing direct methane emissions from ruminants, cutting ruminant numbers would deliver a significant reduction in the greenhouse gas emissions associated with the production of feed crops for livestock, they added.

"Reducing demand for ruminant products could help to achieve substantial greenhouse gas reductions in the near-term," said co-author Helmut Haberl of the Institute of Social Ecology in Austria, "but implementation of demand changes represent a considerable political challenge."

Among agricultural approaches to climate change, reducing demand for meat from ruminants offers greater [greenhouse gas reduction](#) potential than do other steps such as increasing livestock feeding efficiency or crop yields per acre. Nevertheless, they wrote, policies to achieve both types of reductions "have the best chance of providing rapid and lasting climate benefits."

Such steps could have other benefits as well, said co-author Pete Smith of the University of Aberdeen in Scotland. "Cutting the number of ruminant livestock could have additional benefits for food security, human health and environmental conservation involving water quality, wildlife habitat and biodiversity," he explained.

Agricultural researchers are also studying methane reduction through improved animal genetics and methods to inhibit production of the gas during digestion.

International climate negotiations such as the UNFCCC have not given "adequate attention" to greenhouse gas reductions from ruminants, they added. The Kyoto Protocol, for example, does not target ruminant emissions from developing countries, which are among the fastest-growing ruminant producers.

Provided by Oregon State University

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