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**Climate warming contributions of methane emissions from cattle are dependent on estimate source and method used**

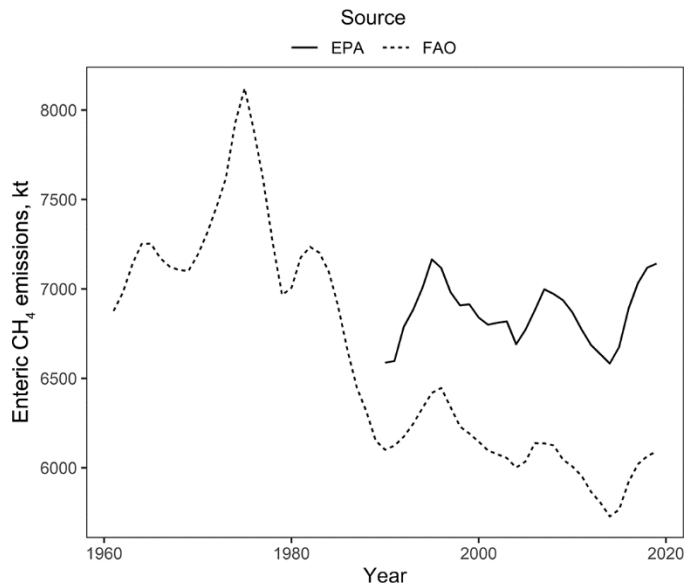
*Accounting method should be considered when interpreting estimates, according to a recent study in Applied Animal Science*

**Champaign, IL, December 12, 2022**—Enteric methane is the primary greenhouse gas emitted by the beef and dairy sectors, but differing accounting methods result in different interpretations of emission estimates. A team of scientists from the Livestock Nutrient Management Research Unit of the USDA-ARS (Bushland, TX, USA), Kansas State University (Manhattan, KS, USA), and Colorado State University (Fort Collins, CO, USA), studied the various ways enteric methane is estimated by reporting bodies and how that affects estimates of global warming. Their findings are reported in recent [article](#) in [Applied Animal Science](#).

The researchers examined differences in estimates of global warming from enteric methane emissions of livestock production by comparing the accounting method and data source. Regarding the article in *Applied Animal Science*, Editor in Chief David K. Beede, PhD, said, “Perspectives and commentary are provided for interpretation of the differences and their importance in predicting ruminant livestock’s contribution to greenhouse gases and global warming.”

The large differences in the US enteric methane emission estimates between the Food and Agriculture Organization (FAO) and US Environmental Protection Agency (EPA) reporting bodies are driven by the accounting method used. The FAO uses a common emission factor (kg CH<sub>4</sub> per animal per year) regardless of the class of livestock, whereas the EPA uses regionally and physiologically specific emission factors.

“By using the different accounting methods, the EPA and FAO report widely ranging emission estimates,” said corresponding author M. R. Beck, PhD, Conservation and Production Research Laboratory, USDA-ARS (Bushland, TX, USA). The EPA estimates for enteric CH<sub>4</sub> emissions were larger than the FAO estimates for every year from 1990 to 2019.



Caption: Estimates of enteric CH<sub>4</sub> emissions from the US Environmental Protection Agency (EPA) and the Food and Agriculture Organization (FAO) are different (Credit: M. R. Beck).

Models that account for diet and animal characteristics provide better estimates of enteric methane production. “It is important to understand the source of the information being cited when discussing inventories of enteric methane and greenhouse gas emissions in general and to understand the different assumptions made by the specific reporting bodies when they derived these estimates,” said Beck.

Of equal importance is how CH<sub>4</sub> emissions are related to a CO<sub>2</sub> equivalent basis. The method used by both the FAO and EPA is the 100-yr global warming potential (GWP100). A newer alternative method, global warming potential\* (GWP\*), has been developed to account for short-lived climate forcers. Using the GWP\* method instead of GWP100 greatly reduces the implied contribution of enteric methane emissions from livestock to climate warming.

Beck states there should be a paradigm shift in how society views the decrease of enteric CH<sub>4</sub> emissions. Rather than being viewed as a significant contributor to the changing climate, GWP\* indicates that a small decrease in enteric CH<sub>4</sub> emissions can lead to a net decrease in climate warming. However, any decrease in enteric CH<sub>4</sub> would eventually create a new steady state and enteric CH<sub>4</sub> emissions would again start contributing to warming. Thus, reducing CH<sub>4</sub> emissions could be viewed as a short-term solution to reduce total anthropogenic contributions to warming, as our society transitions to lower-emission technologies.

The article appears in the December issue of *Applied Animal Science*.

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#### Notes for editors

“Implied climate warming contributions of enteric methane emissions are dependent on the estimate source and accounting methodology,” by M. R. Beck, L. R. Thompson, T. N. Campbell, K. A. Stackhouse-Lawson, and S. L. Archibeque (<https://doi.org/10.15232/aas.2022-02344>), *Applied Animal Science*, volume 38, issue 6 (December 2022), published by FASS Inc. and Elsevier.

This article is available at <https://doi.org/10.15232/aas.2022-02344>.

Full text of the article is also available to credentialed journalists upon request; contact Brittany Morstatter at +1-217-356-3182 ext. 143 or [ARPAS@assochq.org](mailto:ARPAS@assochq.org) to obtain copies. To schedule an interview with the author(s), please contact Matthew R. Beck at [matthew.r.beck@usda.gov](mailto:matthew.r.beck@usda.gov).

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