

# QUICK FACTS ON *Cattle Climate Impacts*

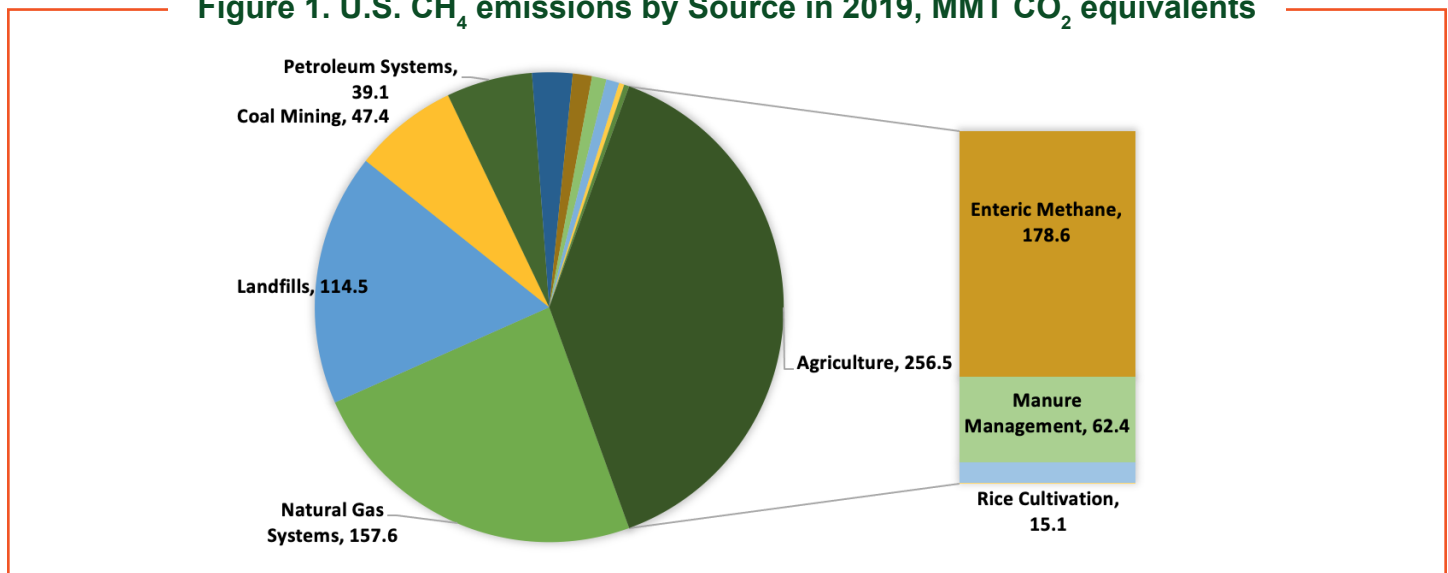
## How much greenhouse gases do cattle emit?

- The carbon footprint of 1 kg of hot carcass is  $21.3 \pm 2.3$  kg CO<sub>2</sub> equivalents.<sup>1</sup>
- Direct greenhouse gases from livestock total 3.8% of U.S. man-made emissions.<sup>2</sup>

## What is the net impact of methane emissions from cattle in the US?

- Enteric methane accounts for 30% of U.S. methane emissions (Figure 1).<sup>2</sup>

**Figure 1. U.S. CH<sub>4</sub> emissions by Source in 2019, MMT CO<sub>2</sub> equivalents**



## What is the difference between GWP<sub>100</sub> and GWP\*? And why is GWP\* important?

- GWP<sub>100</sub> is the most used metric to account for Global Warming Potential (GWP) of greenhouse gas molecules with the unit of carbon dioxide equivalents (CO<sub>2</sub> equivalents).
- GWP<sub>100</sub> inaccurately represents (and can overestimate) methane's impact on temperature when emissions are stable or falling as it fails to account for the atmospheric removal of methane.<sup>3</sup>
- GWP\* provides a more accurate representation of short-lived climate pollutants, such as methane, impact on temperature over time.<sup>4</sup>
- GWP\* also more accurately represents how increases in methane emissions increase warming in comparison to GWP<sub>100</sub>.<sup>3</sup>

<sup>1</sup>Rotz, C. A., S. Asem-Hiablie, S. Place, and G. Thoma. 2019. Environmental footprints of beef cattle production in the United States. *Agric. Syst.* 169:1-13. Doi: 10.1016/j.agsy.2018.11.005

<sup>2</sup>EPA. 2021. Inventory of U.S. greenhouse gas emissions and sinks: 1990-2019. EPA 430-R-21-005. Environ. Prot. Agency, Washington, DC.

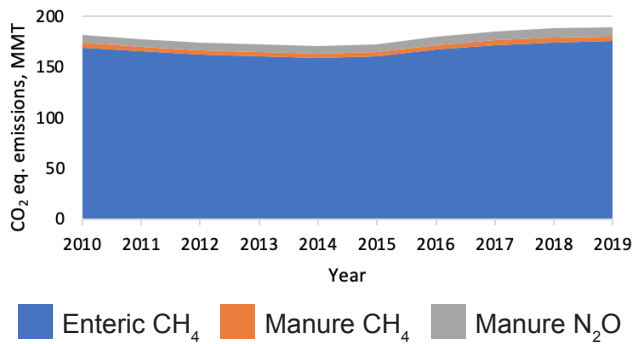
<sup>3</sup>Smith, M. A., M. Cain, and M. R. Allen. 2021. Further improvement of warming equivalent emissions calculation. *npj Climate and Atmospheric Science.* 4:19. Doi: 10.1038/s41612-019-0086-4

<sup>4</sup>Allen, M. R., K. P. Shine, J. S. Fuglestedt, R. J. Millar, M. Cain, D. J. Frame, A. H. Macey. 2018. A solution to the misrepresentations of CO<sub>2</sub>-equivalent emissions of short-lived climate pollutants under ambitious mitigation. *npj Climate and Atmospheric Science.* 1:16. Doi: 10.1038/s41612-018-0026-8

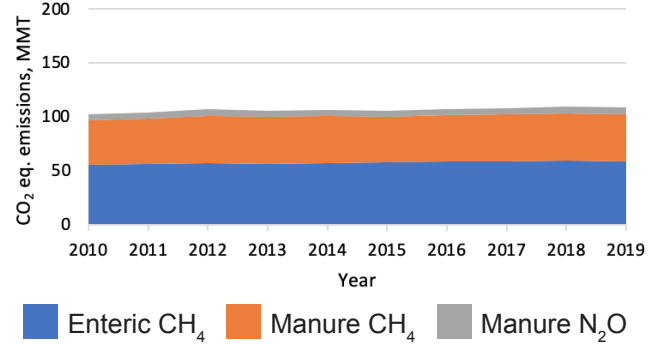
## How do greenhouse gas emissions differ between dairy and beef?

- Enteric methane emissions represent 54% of the dairy industry's and 93% beef cattle industry's direct greenhouse gas emissions (see Figures 2 and 3).<sup>2</sup>

**Figure 2: Beef Cattle Emissions by year in CO<sub>2</sub> equivalents, MMT**



**Figure 3: Dairy Cattle Emissions by year in CO<sub>2</sub> equivalents, MMT**



\*CO<sub>2</sub>e calculated, per EPA, using GWP<sub>100</sub>

## Cattle are upcyclers of lower quality forages.

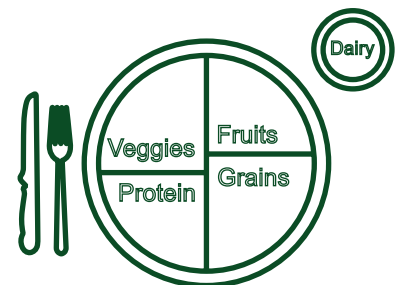
- Livestock allows us to produce food on land unsuitable for cultivation, while enhancing ecosystems.
- For the life cycle of the animal, the diet consists of 82% forage, 11% grain and 7% byproduct and waste product feeds.<sup>5</sup>
- This indicates that 10–15% of the feed consumed in beef production comes from sources that might be available for human consumption.<sup>5</sup>

## Are cattle a part of the climate solution?

- Rangeland store 20% of the globe's organic carbon and in some cases grazing lands also can sequester carbon.<sup>6</sup> The most important thing producers can do is to<sup>6</sup>:
  - Preserve rangelands (avoid conversion)
  - Restore cultivated and degraded lands
  - Practice adaptive livestock management

## Meat is part of a healthy diet.

- The National Dietary Guidelines include meat as part of a healthy diet. Nutrient-dense foods, like lean meats and poultry, provide vitamins, minerals, and other health-promoting components.<sup>7</sup>
- The global population in 2100 is projected to reach 12 billion people. Animal agriculture is an essential protein source for meeting a growing population's food needs.



<sup>5</sup>Rotz, C. A., S. Asem-Hiablie, S. Place, and G. Thoma. 2019. Environmental footprints of beef cattle production in the United States. *Agric. Syst.* 169:1-13. Doi: 10.1016/j.agry.2018.11.005

<sup>6</sup>Sanderson, J. S., C. Beutler, J. R. Brown, I. Burke, T. Chapman, R. T. Conant, J. D. Derner, M. Easter, S. D. Fuhlendorf, G. Grissom, J. E. Herrick, D. Liptzin, J. A. Morgan, R. Murph, C. Pague, I. Rangwala, D. Ray, R. Rondeau, T. Schulz, and T. Sullivan. 2020. Cattle, conservation, and carbon in the western Great Plains. *Journal of Soil and Water Conservation.* 75:1. Doi: 10.2489/jswc.75.1.5A

<sup>7</sup>U. S. Department of Agriculture and U. S. Department of Health and Human Services. 2020. *Dietary Guidelines for Americans, 2020-2025.* 9th edition. Accessed from: [DietaryGuidelines.gov](https://www.dietaryguidelines.gov)