

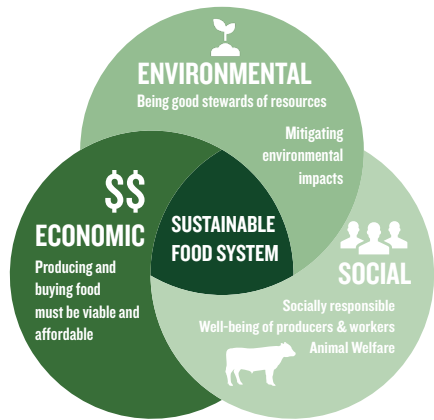
SUSTAINABILITY IN BEEF PRODUCTION



COLORADO STATE UNIVERSITY

SUSTAINABLE SOLUTIONS FOR ANIMAL AGRICULTURE

The Three Pillars of Sustainability:



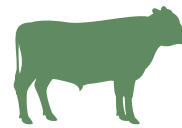
Animal Agriculture: Part of a Sustainable Food system

Cattle are upcyclers:

Livestock allow us to produce food on land unsuitable for cultivation while enhancing ecosystems.¹



Solar energy harvested in plants and ecosystems



Cattle graze human inedible plants

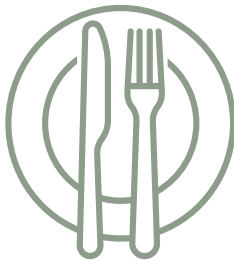


Convert human inedible products into high-quality, affordable, nutrient-dense protein

Nutrient Dense Foods Are an Important Part of a Healthy Diet

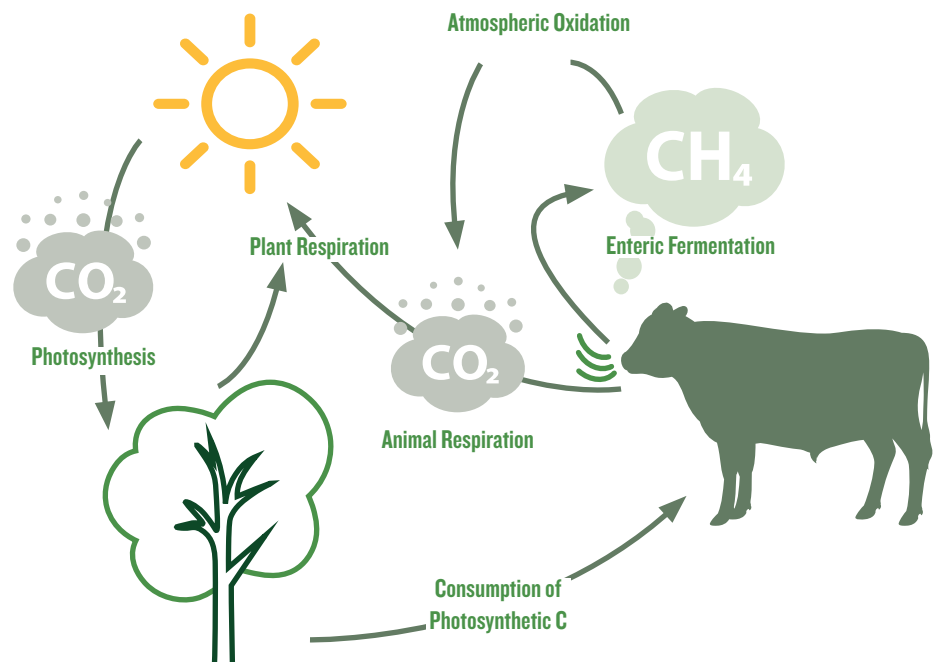
■ High-quality protein, vitamin B, iron, and zinc are commonly found in animal-sourced foods such as beef.²

■ By incorporating a diverse range of nutrient-dense foods, individuals can ensure they meet their daily nutritional needs.²



Animal Agriculture Plays a Role in the Carbon Cycle

Ruminant animals, such as cattle, eructate methane out of their mouths, which acts as a short-lived climate pollutant. More beef produced with less greenhouse gas emissions reflects resource and nutrient use efficiency.³



References

¹ From the Council for Agricultural Science (1999)

² From Adesogan et al. (2020)

³ Adapted from Broock et al (2016)

Breakdown of Agricultural Emissions as Percent of U.S. Total GHG Emissions

Agriculture makes up roughly 9.3 percent of total U.S. emissions.⁴
 Animal agriculture alone accounts for roughly 4.4 percent of total U.S. emissions.⁴

FIGURE 1: 2021 U.S. GHG EMISSIONS BY IPCC SECTOR

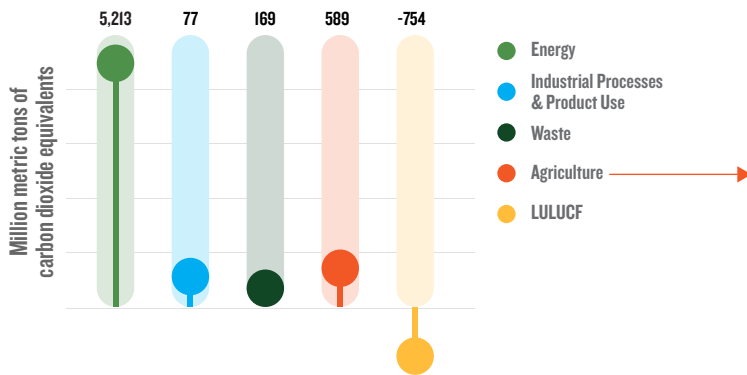
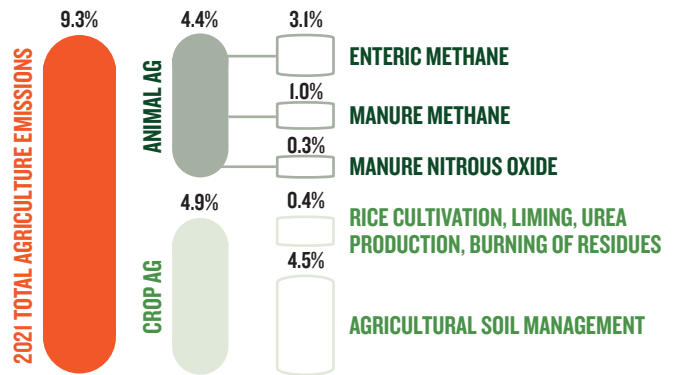


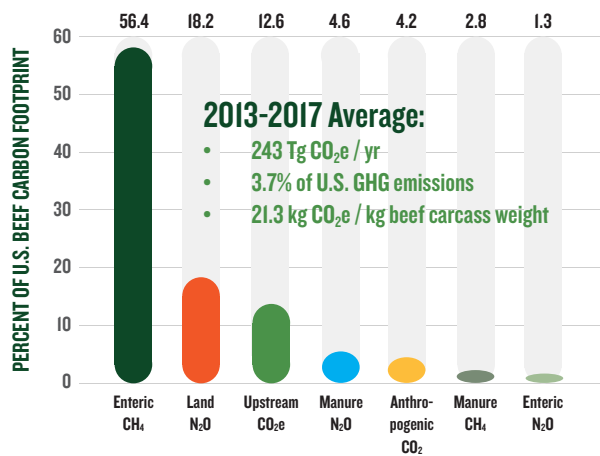
FIGURE 2: 2021 U.S. GHG EMISSIONS IN AGRICULTURE



Enteric Methane in Animal Agriculture

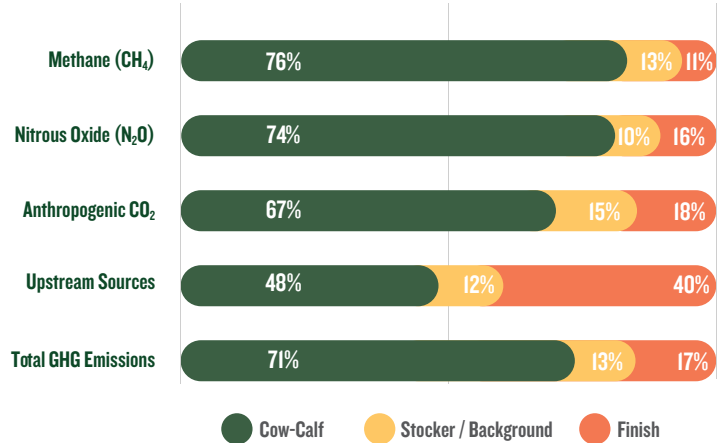
Of the emissions produced by animal agriculture, enteric methane is the largest contributor⁵

FIGURE 3: GHG EMISSIONS PROFILE OF U.S. BEEF CATTLE PRODUCTION




The majority of methane emissions in beef cattle production comes from the cow-calf sector⁵

FIGURE 4: ENVIRONMENTAL FOOTPRINTS OF BEEF CATTLE PRODUCTION IN THE U.S.




ENTERIC METHANE MAY BE MITIGATED WITH:



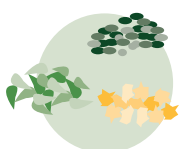
Animal & Feed Management

Feed processing, genetic selection, improving animal health and pasture management, increasing feeding level & forage quality, optimizing temperature, TMR feeding⁶



Rumen Manipulation

Additives, defaunation, electron sink⁶



Diet Formulation

By-products, decreasing forage to concentrate ratio, minerals and salts, oils and fats, oilseeds, protein feeds, tanniferous forages, urea⁶

References

⁴ From The Environmental Protection Agency (2023)
⁵ From Rotz et al. (2019)
⁶ From Arndt et al. (2022)

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