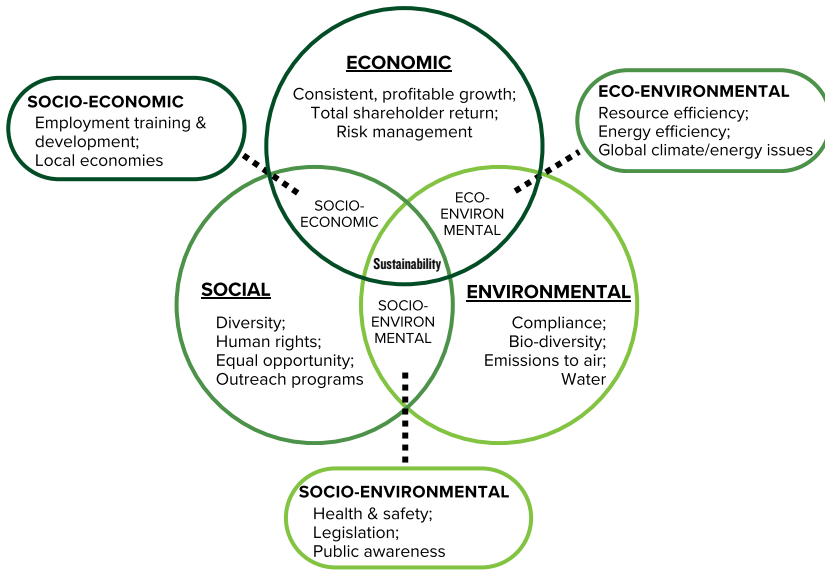


SUSTAINABILITY IN ANIMAL AGRICULTURE

A Sustainable System Balances the Three Pillars of Sustainability¹



Sustainability is Here to Stay



Economic, social, governance (ESG) and financial investors are driving much of the sustainability and climate discussion.



Advancing faster now with ESG and GHG commitments. Large unknowns in how goals will be measured and achieved.



Research shows that animal efficiency has increased in the last century resulting in more beef produced and higher profitability.

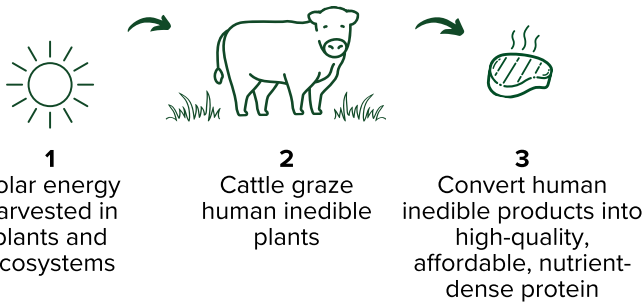


Health, climate, ethics, and nutrition have converged and many times science and emotion are competing.

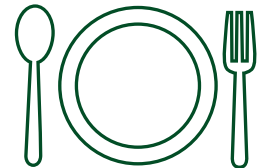
ANIMAL AGRICULTURE IS PART OF A SUSTAINABLE FOOD SYSTEM

Cattle are Upcyclers

Livestock allow us to produce food on land unsuitable for cultivation while enhancing ecosystems²



Nutrient Dense Foods Are an Important Part of a Healthy Diet

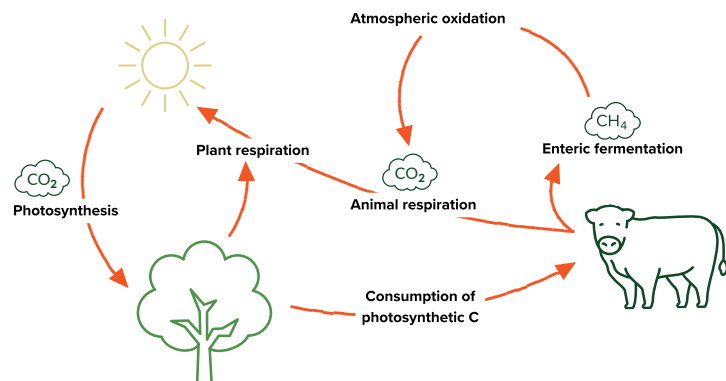


Human diets must contain a variety of nutrient-dense foods to ensure optimal health for the growing global population. High-quality protein, vitamin B, iron, and zinc are commonly found in animal-sourced foods such as beef³

By incorporating a diverse range of nutrient-dense foods, individuals can ensure they meet their daily nutritional needs³

Animal Agriculture Plays a Role in the Carbon Cycle

Ruminant animals, such as cattle, eructate methane out of their mouths which acts a short-lived climate pollutant. More beef produced with less greenhouse gas emissions reflects resource and nutrient use efficiency⁴



BREAKDOWN OF AGRICULTURAL EMISSIONS AS PERCENT OF U.S. TOTAL GHG EMISSIONS

*Agriculture makes up roughly 9.3 percent of total US emissions⁵
 Animal agriculture alone accounts for roughly 4.4 percent of total US emissions⁵*

FIGURE 1: 2021 US GHG EMISSIONS BY IPCC SECTOR

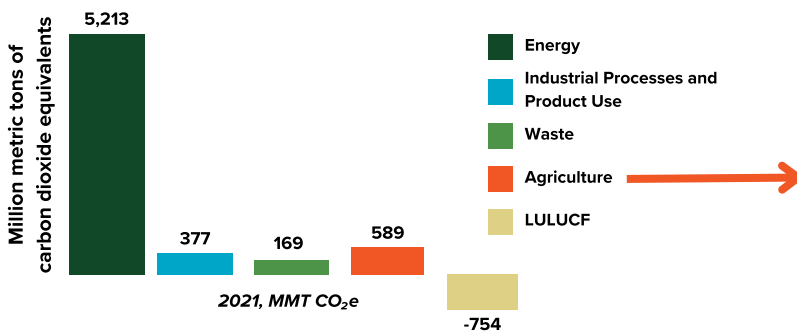
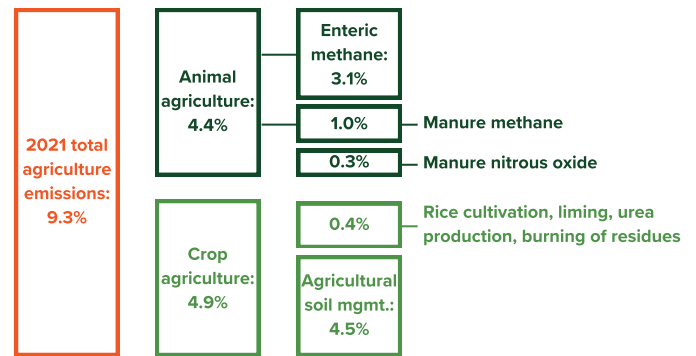


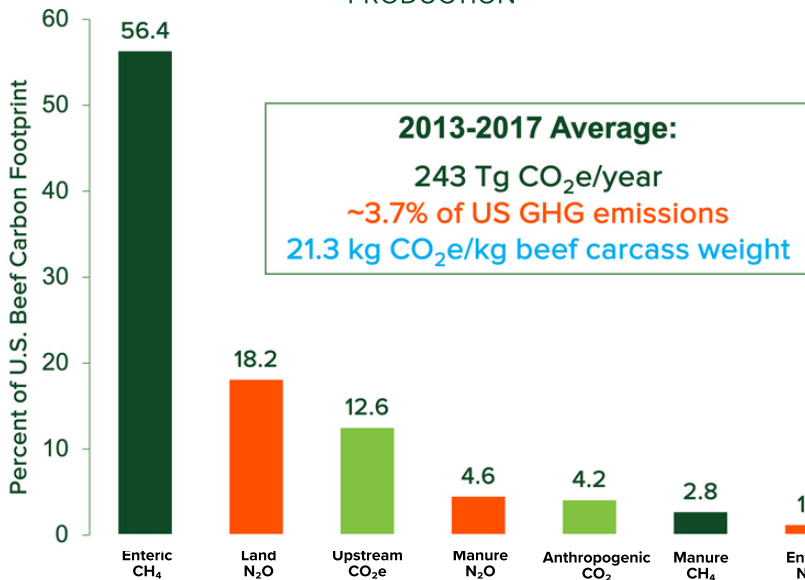
FIGURE 2: 2021 US GHG EMISSIONS IN AGRICULTURE



ENTERIC METHANE IN ANIMAL AGRICULTURE

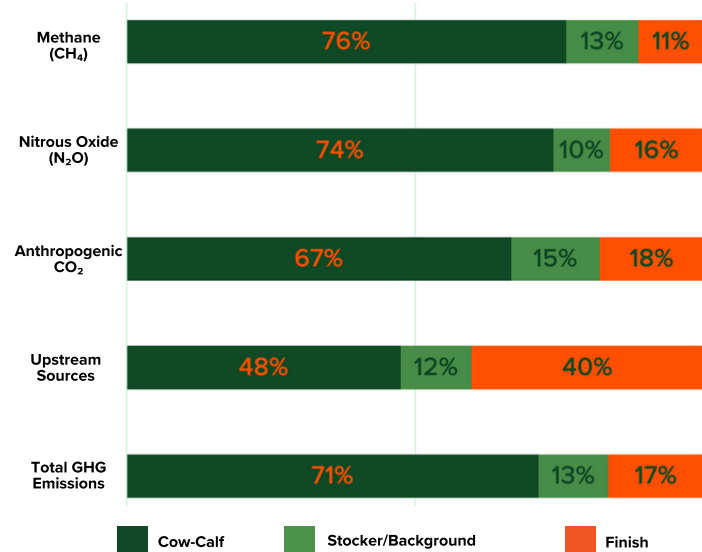
Of the emissions produced by animal agriculture enteric methane is the largest contributor⁶

FIGURE 3: GHG EMISSIONS PROFILE OF US BEEF CATTLE PRODUCTION



The majority of methane emissions in beef cattle production comes from the cow-calf sector⁶

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



Enteric Methane Can Be Mitigated With

Animal & Feed Management

Feed processing, genetic selection, improving animal health, improving pasture management, increasing feeding level, increasing forage quality, optimizing temperature, TMR feeding⁷

Rumen Manipulation

Additives, defaunation, electron sink⁷

Diet Formulation

By-products, decreasing forage to concentrate ratio, minerals and salts, oils and fats, oilseeds, protein feeds, tanniferous forages, urea⁷

REFERENCES

- From Von Keyerlingk et al. (2013)
- From the Council for Agricultural Science (1999)
- From Adesogan et al. (2020)
- Adapted from Broock et al. (2016)
- From The Environmental Protection Agency (2023)
- From Rotz et al. (2019)
- From Arndt et al. (2022)

Full references list can be found [here](#)

ABOUT AGNEXT

Vision: Animal agriculture is a sustainable component of our global food system by providing economic, social and environmental benefits to Colorado, the nation and the world.

Mission: Identify and scale innovation that fosters the health of animals and ecosystems to promote profitable industries that support vibrant communities.

CONNECT WITH AGNEXT



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