

Reference Sources

Literature that supports the following statements in our video, *The Straight Poop*

1. Methane is far more powerful than carbon dioxide.

- *European Union/Commission:*
https://energy.ec.europa.eu/topics/oil-gas-and-coal/methane-emissions_en#:~:text=On%20a%20100%2Dyear%20timescale,on%20a%2020%2Dyear%20timescale.

“On a 100-year timescale, methane has 28 times greater global warming potential than carbon dioxide and is 84 times more potent on a 20-year timescale.”

2. *Almost half the habitable land in the world is used to raise and feed livestock*

- *Herrero, Mario, Philip K Thornton, Pierre Gerber, and Robin S Reid. 2009. Livestock, livelihoods and the environment: understanding the trade-offs. Current Opinion in Environmental Sustainability, Volume 1, Issue 2, December 2009, Pages 111-12.*

“Livestock systems occupy 45% of the global surface area...”

- *Ripple, W., Smith, P., Haberl, H. et al. Ruminants, climate change and climate policy. Nature Clim Change 4, 2–5 (2014). <https://doi.org/10.1038/nclimate2081>.*

“...ruminant production ... globally occupies more area than any other land use.”

- *Poore, J. and T. Nemecek. 2018. Reducing food’s environmental impacts through producers and consumers. Science 360, 987–992.*

“Today’s agricultural system is also incredibly resource intensive, covering ~43% of the world’s ice- and desert-free land.”

3. Livestock farming the cause of 80% of Amazon rainforest destruction

- West, T. A. P. et al. (2022). *Protected areas still used to produce Brazil's cattle. Conservation Letters*, 15, e12916. *Journal of Society of Conservation Biology*.

“Historically, ~80% of Amazonian deforestation resulted from pasture expansion”

- Skidmore, Marin Elisabeth, et al. 2021. *Cattle ranchers and deforestation in the Brazilian Amazon: Production, location, and policies. Global Environmental Change*.

“Pasture expansion for cattle production is the main driver of deforestation and has been linked to 80% of clearing...”

4. Livestock produce about the same amount of GHG emissions as the entire transportation sector (Livestock emissions include feed production, transportation, and land use changes)

- Rojas-Downing, M. Melissa, A. Pouyan Nejadhashemi, Timothy Harrigan, Sean A. Woznicki. 2017. *Climate change and livestock: Impacts, adaptation, and Mitigation*.

“Emissions from livestock production contribute more GHG to the atmosphere than the entire global transportation sector”.

- Twine, R. 2021. *Emissions from Animal Agriculture — 16.5% Is the New Minimum Figure. Sustainability*, 2021, 13, 6276.
<https://doi.org/10.3390/su13116276>

“... this article finds that the figure of minimum estimate should be updated to 16.5%.”

- United Nations News, 2006. *Rearing cattle produces more greenhouse gases than driving cars, UN report warns.* <https://news.un.org/en/story/2006/11/201222-rearing-cattle-produces-more-greenhouse-gases-driving-cars-un-report-warns>

“Cattle-rearing generates more global warming greenhouse gases, as measured in CO₂ equivalent, than transportation”

- Nick Watts et al. 2021. *The 2020 report of the Lancet Countdown on health and climate change: responding to converging crises*. *Lancet* 2021; 397:129-70.

“The food system is responsible for 20–30% of global greenhouse gas emissions, most of which originate from meat and dairy livestock.”

5. If cows were a country they would be third in the world in GHG emissions

- GatesNotes: Oct. 17, 2018. *Climate change and the 75% problem: The five areas where we need innovation*. Source: UNFCCC, European Commission, UNFAO. [https://www.gatesnotes.com/My-plan-for-fighting-climate-change#:~:text=Agriculture%20\(24%25\)..largest%20emitter%20of%20greenhouse%20gases!](https://www.gatesnotes.com/My-plan-for-fighting-climate-change#:~:text=Agriculture%20(24%25)..largest%20emitter%20of%20greenhouse%20gases!)

Hannah Ritchie and Mark Roser. 2020. *CO₂ Emissions*. Published online at OurWorldInData.org. Retrieved from: <https://ourworldindata.org/co2-emissions#annual-co2-emissions>

- Giampiero Grossi et. al. 2019 *Livestock and climate change: impact of livestock on climate and mitigation strategies*. *Animal Frontiers*. Jan. 2019, Vol. 9, No. 1.

6. People are eating more beef than even before

- Nick Watts et al. 2021. *The 2020 report of the Lancet Countdown on health and climate change: responding to converging crises*. *Lancet* 2021; 397:129-70.

“...ruminant livestock continue to dominate agriculture’s contribution to climate change and are responsible for 56% of total agricultural emissions and 93% of all livestock emissions globally. This proportion represents a 5.5% increase in the per-capita emissions from beef consumption between 2000 and 2017 ...”

During this time, “Overall emissions from livestock production have increased by 16%...”