



MASSACHUSETTS SIERRA CLUB

WHY GO PLANT-BASED?

Cattle represent **65%** of greenhouse gas emissions out of the agriculture sector. ⁴

Meat, aquaculture, eggs, and dairy use **83%** of global farmland despite providing only 18% of our calories. ⁹

Livestock production uses **40%** of global arable land. ⁸

The average water footprint per calorie for beef is **20 times** larger than for cereals. ⁷

Cattle ranching accounts for **80%** of current deforestation rates in every Amazon country. ¹

3 out of every 4 new infectious diseases in people come from animals according to the CDC. ¹²

Over **34%** of global fisheries are being overfished according to the Food & Agriculture Organization. ³

Of all marine life that is caught, **40%** is thrown overboard as bycatch. ¹⁰

The number of whales, dolphins, and porpoises that are killed as bycatch annually is **300,000**. ¹¹

The IPCC recommends a shift to a plant-based diet to free millions of square kilometers of land **by 2050**. ⁶

Source Information

1. Cattle Ranching in the Amazon Region. (2021). Retrieved from <https://globalforestatlas.yale.edu/amazon/land-use/cattle-ranching>
 - Cattle ranching is the largest driver of deforestation in every Amazon country, accounting for 80% of current deforestation rates.
2. Dopelt, K., Radon, P., & Davidovitch, N. (2019, April 16). Environmental Effects of the Livestock Industry: The Relationship between Knowledge, Attitudes, and Behavior among Students in Israel. *International Journal of Environmental Research and Public Health*, 16(8), 1359. doi:10.3390/ijerph16081359
3. FAO. 2020. The State of World Fisheries and Aquaculture 2020. Sustainability in action. Rome. <https://doi.org/10.4060/ca9229en>
 - Over 1/3 of global fisheries are overfished as of 2020.
4. Gerber, P.J., Steinfeld, H., Henderson, B., Mottet, A., Opio, C., Dijkman, J., Faluccci, A. & Tempio, G. 2013. Tackling climate change through livestock – A global assessment of emissions and mitigation opportunities. Food and Agriculture Organization of the United Nations (FAO), Rome.
 - Beef production contributes 2.9 gigatonnes or 41 percent of total sector emissions while emissions from milk production amount to 1.4 gigatonnes or 20 percent of total sector emissions (23)
 - Globally, pork production is estimated to emit about 668 million tonnes CO₂ -eq, representing 9 percent of the livestock sector emissions (35).
 - Globally, chicken supply chains emit GHG emissions of 606 million tonnes CO₂ -eq, representing 8 percent of the sector's emissions. (37)
 - Cattle are the main contributor to the sector's emissions with about 4.6 gigatonnes CO₂ -eq, representing 65 percent of sector emissions. Beef cattle (producing meat and non-edible outputs) and dairy cattle (producing both meat and milk, in addition to non-edible outputs) generate similar amounts of GHG emissions. (15)
5. Virginia T. Guidry, Sarah M. Rhodes, Courtney G. Woods, Devon J. Hall and Jessica L. Rinsky. *North Carolina Medical Journal* September 2018, 79 (5) 324-328; DOI: <https://doi.org/10.18043/ncm.79.5.324>
 - In North Carolina, ranked 2nd in the U.S. for production of hogs, hog farms are disproportionately located in low-income communities of color and expose people to respiratory illness and infectious disease through air and water pollution.
6. IPCC, 2019: Summary for Policymakers. In: *Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems* [P.R. Shukla, J. Skea, E. Calvo Buendia, V. Masson-Delmotte, H.- O. Pörtner, D. C. Roberts, P. Zhai, R. Slade, S. Connors, R. van Diemen, M. Ferrat, E. Haughey, S. Luz, S. Neogi, M. Pathak, J. Petzold, J. Portugal Pereira, P. Vyas, E. Huntley, K. Kissick, M. Belkacemi, J. Malley, (eds.)]. In press.
 - Livestock on managed pastures and rangelands accounted for more than one half of total anthropogenic N₂O emissions from agriculture in 2014
 - By 2050, dietary changes could free several million km² (medium confidence) of land and provide a technical mitigation potential of 0.7 to 8.0 GtCO₂eq yr⁻¹, relative to business as usual projections (high confidence).

7. Mekonnen, M. M., & Hoekstra, A. Y. (2012, April). A Global Assessment of the Water Footprint of Farm Animal Products [Abstract]. *Ecosystems*, 15(3), 401-415. doi:10.1007/s10021-011-9517-8

- The average water footprint per calorie for beef is 20 times larger than for cereals and starchy roots. The water footprint per gram of protein for milk, eggs and chicken meat is 1.5 times larger than for pulses. The unfavorable feed conversion efficiency for animal products is largely responsible for the relatively large water footprint of animal products compared to the crop products. (Abstract)

8. Mottet, A., De Haan, C., Falcucci, A., Tempio, G., Opio, C., & Gerber, P. (2017, September). Livestock: On our plates or eating at our table? A new analysis of the feed/food debate. *Global Food Security*, 14, 1-8. doi:10.1016/j.gfs.2017.01.001

- Livestock consume one third of global cereal production and uses about 40% of global arable land
- Livestock use 2 billion ha of grasslands, of which about 700 million could be used as cropland

9. Poore, J., and T. Nemecek. "Reducing Food's Environmental Impacts through Producers and Consumers." *Science*, vol. 360, no. 6392, 1 June 2018, pp. 987-992., doi:10.1126/science.aaq0216.

- Today's food supply chain creates ~13.7 billion metric tons of carbon dioxide equivalents (CO₂eq), 26% of anthropogenic GHG emissions.
- In particular, the impacts of animal products can markedly exceed those of vegetable substitutes (Fig. 1), to such a degree that meat, aquaculture, eggs, and dairy use ~83% of the world's farmland and contribute 56 to 58% of food's different emissions, despite providing only 37% of our protein and 18% of our calories.
- Moving from current diets to a diet that excludes animal products (table S13) (35) has transformative potential, reducing food's land use by 3.1 (2.8 to 3.3) billion ha (a 76% reduction), including a 19% reduction in arable land; food's GHG emissions by 6.6 (5.5 to 7.4) billion metric tons of CO₂eq (a 49% reduction); acidification by 50% (45 to 54%); eutrophication by 49% (37 to 56%); and scarcity-weighted freshwater withdrawals by 19% (-5 to 32%) for a 2010 reference year.

10. Keledjian, Amanda, et al. *Oceana - Protecting the World's Oceans, 2014, WASTED CATCH: UNSOLVED PROBLEMS IN U.S. FISHERIES*, oceana.org/sites/default/files/Bycatch_Report_FINAL.pdf.

- Studies estimate that up to 40% of all marine life caught is thrown overboard as bycatch.

11. Bycatch." IWC, International Whaling Commission, iwc.int/bycatch.

- Over 300,000 whales, dolphins and porpoises are killed as bycatch every year

12. "Zoonotic Diseases." Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, 14 July 2017, www.cdc.gov/onehealth/basics/zoonotic-diseases.html.

- 3 out of every 4 new or emerging infectious diseases in people come from animals (CDC 2017)