HUMANE SOCIETY INTERNATIONAL

An HSI Fact Sheet
Animal Agriculture & Climate Change

According to a 2006 report by the Food and Agriculture Organization (FAO) of the United Nations, the livestock sector emits more greenhouse gases than cars and SUVs.

Greenhouse Gas Emissions (GHGs). The animal agriculture sector is responsible for 18% of greenhouse gas emissions, measured in carbon dioxide (CO_2) equivalent, higher than the share contributed by cars, trucks, and sport utility vehicles.[1] This figure accounts for the livestock sector's direct impacts as well as the impacts of feeding the world's approximately 63 billion farm animals.[2] Specifically, animal agriculture accounts for:

- 9% of annual human-induced CO_2 emissions,[3]
- 37% of methane (CH_4) emissions, which has more than 20 times the global warming potential of CO_2,[4] and
- 65% of nitrous oxide (N_2O) emissions, which has almost 300 times CO_2's global warming potential.[5] Mapping has shown a strong relationship between excessive nitrogen in the atmosphere and the location of intensive farm animal production areas.[6]

At virtually every step of meat, egg, and dairy production, climate-changing gases are released into the atmosphere, disrupting weather, temperature, and ecosystem health.[7]

Farm Animal Waste. As animal agriculture has intensified in recent decades, more animals have been intensively confined in fewer, but larger, operations. Many are warehoused by the tens if not hundreds of thousands in industrialized production facilities known as factory farms, which results in large amounts of animal waste to be concentrated in small areas. In the United States, to provide one notable example, the U.S. Department of Agriculture estimates that confined farm animals generate approximately 500 million tons of manure annually, three times more raw waste than generated by Americans.[8] Around the world, farm animals produce billions of tonnes of manure each year.[9]

Feed. The production of animal feed—mainly high protein and concentrated feeds made from corn and soybeans—requires large amounts of chemical fertilizer. Animal production accounts for a very significant portion of total fertilizer use—more than half of the global corn crop is used for animal feed.[10] Corn uses more nitrogen fertilizer than any other crop, while other feed crops, including barley and sorghum, also use significant amounts. In total, experts estimate that fertilizer used in feed production contributes "an estimated annual emission of CO_2 of more than 40 million tonnes."[11]

Energy Use Varies by Type of Production System. Massive, enclosed factory farms (also known as confined animal feeding operations, or CAFOs) use a great deal of energy for lighting, heating, cooling, automated machinery for feeding and watering, and ventilation. In addition, to produce feed for farm animals, the combined fossil fuel for machinery and energy use for seed and the production of herbicides and pesticides usually exceeds that of fertilizer production. On-farm fossil fuel use may emit as much as 90 million tonnes of carbon dioxide per year alone.[12] Production systems that rely on grasslands or crop residues for feed, on the other hand, usually have very low or even negligible fossil fuel use.

Deforestation. According to the FAO, deforestation for livestock production is responsible for 2.4 billion tonnes of CO_2 per year.[13] A 2004 Center for International Forestry Research (CIFOR) report stated that the total area of forest lost increased from 41.5 million hectares in 1990 to 58.7 million hectares in 2000. In just ten years, an area twice the size of Portugal was lost, most of it to pasture for farm animal production.[14] In June 2005, the FAO predicted that by 2010, more than 1.2 million hectares of forest in Central America and 18 million hectares in South America will disappear due, in large part, to clearing land for grazing cattle.[15]

Food for Thought. An article published in *The Lancet* in 2007 advocates a reduction in meat consumption to 90 grams per person per day in order to stabilize greenhouse gas emissions from this sector. (A single beef hamburger patty is 80 to 100 grams.) "For the world's higher-income populations," the authors write, "greenhouse-gas emissions from meat-eating warrant the same scrutiny as do those from driving and flying."[16] Yet, while many consumers are willing to pay extra for cars that run on ethanol, biodiesel, or electricity to combat global warming, there has been less awareness of animal agriculture's impacts on climate change. The FAO calls for action on many fronts, recommending a range of measures to mitigate the environmental assault by animal agriculture, including:

- **Land degradation:** Restore damaged land through soil conservation, better management of grazing systems, and protection of sensitive areas.
- **Greenhouse gas emissions:** Improve animal nutrition and manure management to cut methane and nitrogen emissions.
- **Water pollution:** Select more natural diets to improve nutrient absorption, better manage animal waste in industrial production units, improve manure management, and make better use of processed manure on croplands.
- **Biodiversity loss:** As well as implementing the measures above, improve protection of wild areas, maintain connectivity among protected areas, and integrate livestock production and producers into landscape management.[17]

Mitigating the animal agriculture sector's significant yet underappreciated role in climate change is vital for the health and sustainability of the planet, the environment, and its human and nonhuman inhabitants. As experts at the Intergovernmental Panel on Climate Change, the Food and Agriculture Organization of the United Nations, and numerous other leading global entities have identified, reducing GHG emissions is both urgent and critical. As the largest anthropogenic user of land and responsible for more GHG emissions than transportation, the farm animal production sector must be held accountable for its many deleterious impacts, and changes in animal agricultural practices must be achieved. Incorporating environmentally sound and animal welfare-friendly practices into daily life, including adopting consumptive habits less reliant on meat, eggs, and dairy products, are necessary to slow the effects of climate change.

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[11] Ibid., p. 88.
[12] Ibid., pp. 88-9.
[13] Ibid., p. 90.
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