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Livestock, Food Transport Major Causes of Global Warming

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Western Turf Wars: The Politics of Public Lands Ranching

Reports implicating livestock production in the degradation of global environmental health keep rolling in. As you may recall, in the Winter 2006 issue of *Sierra Atlantic*, Linda DeStefano (“How animal agriculture—and methane—boost global warming”) cited a study by University of Chicago researchers showing the contribution of animal agriculture to global methane production and the resulting effects on global warming. Now we have a UN FAO report: “Livestock’s long shadow: Environmental issues and options” that examines a broad range of environmental impacts from livestock production, not just those that directly contribute to global warming. I’ll just pass along a few of the more interesting sound bites that I’ve gleaned from a cursory reading of the document.

As Linda noted in her article, worldwide livestock production substantially contributes to greenhouse gases. The subsequent UN document now reports that livestock production accounts for 18 percent of greenhouse gas emissions measured in CO₂ equivalent. This is a higher contribution than from the transportation sector. Breaking down the livestock emissions into component gasses, we find among them 9 percent of the anthropogenic (human-produced) CO₂. Most of this contribution derives from land-use changes—especially deforestation—caused by expansion of pastures and arable land for feed crops. Then there’s methane, about which Linda primarily wrote. Livestock emit 37 percent of anthropogenic methane (with 23 times the global warming potential (GWP) of CO₂)—most of that deriving from enteric fermentation by ruminants. (Enteric fermentation, by the way, results from the digestive action of microorganisms in the rumen of cattle, etc.) The third major greenhouse gas resulting from livestock production is nitrous oxide, with the sector weighing in at 65 percent of the anthropogenically produced portion. Nitrous oxide has a whopping 296 times the GWP of CO₂. Finally, livestock are responsible for 64 percent of anthropogenic ammonia emissions, which contribute significantly to acid rain and acidification of ecosystems.

But the UN report looks at much more than just livestock production’s contribution to global warming. The livestock sector is also a key player in increasing water use, accounting for over 8 percent of that attributed to human activity, and most of this for the irrigation of feed crops.

Livestock production is also a major source of water pollution. In the U.S., livestock are responsible for an estimated 55 percent of erosion and sediment, and a third of the loads of nitrogen and phosphorus deposited into freshwater resources. Nitrogen washing down the Mississippi Basin is a major contributor to the Gulf of Mexico's "dead zone." The UN report cites a study showing that a dietary shift away from grain-fed beef to vegetarianism in the U.S. could reduce total land and fertilizer demands of Mississippi Basin crops by over 50 percent, with no change in total production of human food protein. And with the result of returning nitrate-nitrogen export by the Mississippi River to levels at which the Gulf's dead zone was small or non-existent.

Livestock production also has a major detrimental impact on biodiversity—30 percent of the earth's land surface that was once habitat for wildlife has now been pre-empted for livestock. As the report states: "Indeed, the livestock sector may well be the leading player in the reduction of biodiversity, since it is the major driver of deforestation, as well as one of the leading drivers of land degradation, pollution, climate change, overfishing, sedimentation of coastal areas and facilitation of invasion by alien species."

Unfortunately, livestock production is not the only problem with how we produce food. Bill McKibben, in his recent book *Deep Economy* (Times Books, 2007), provides an abundance of grim statistics that reveal the dysfunctional nature of our national and international food production system. For example, since the 1960s, the tonnage of food shipped between countries has grown fourfold, while human population has barely doubled. And between 1910 and 1983, while U.S. corn yields grew 346 percent, energy consumption for agriculture increased 810 percent.

But focusing on local and regional food production can begin to reverse these trends of increased energy inputs and increasing pollution from production and distribution of food. According to the most recent USDA Census of Agriculture, smaller farms produce far more food per acre, whether that's measured in tons, calories, or dollars. And the environmental benefits are substantial. McKibben cites a Japanese study showing that eating locally produced food would be the equivalent of cutting household energy use by 20 percent. And compared with national and international food production/distribution models, local/regional systems cut CO₂ emissions by 80 to 96 percent.

The message is clear: the greatest environmental benefit achievable by an individual's actions comes from substantially reducing one's meat and dairy consumption, and from purchasing locally produced organic foodstuffs whenever possible.

For more about the contribution of cattle grazing to global warming, see Mike Hudak's article "Cattle Grazing on Federal Public Lands Contributes to Global Warming."