

Humans' beef with livestock: a warmer planet

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American meat eaters are responsible for 1.5 more tons of carbon dioxide per person than vegetarians every year.

As Congress begins to tackle the causes and cures of global warming, the action focuses on gas-guzzling vehicles and coal-fired power plants, not on lowly bovines.

Yet livestock are a major emitter of greenhouse gases that cause climate change. And as meat becomes a growing mainstay of human diet around the world, changing what we eat may prove as hard as changing what we drive.

It's not just the well-known and frequently joked-about flatulence and manure of grass-chewing cattle that's the problem, according to a recent report by the Food and Agriculture Organization of the United Nations (FAO). Land-use changes, especially deforestation to expand pastures and to create arable land for feed crops, is a big part. So is the use of energy to produce fertilizers, to run the slaughterhouses and meat-processing plants, and to pump water.

"Livestock are one of the most significant contributors to today's most serious environmental problems," Henning Steinfeld, senior author of the report, said when the FAO findings were released in November.

Livestock are responsible for 18 percent of greenhouse-gas emissions as measured in carbon dioxide equivalent, reports the FAO. This includes 9 percent of all CO₂ emissions, 37 percent of methane, and 65 percent of nitrous oxide. Altogether, that's more than the emissions caused by transportation.

The latter two gases are particularly troubling – even though they represent far smaller concentrations in atmosphere than CO₂, which remains the main global warming culprit. But methane has 23 times the global warming potential (GWP) of CO₂ and nitrous oxide has 296 times the warming potential of carbon dioxide.

Methane could become a greater problem if the permafrost in northern latitudes thaws with increasing temperatures, releasing the gas now trapped below decaying vegetation. What's more certain is that emissions of these gases can spike as humans consume more livestock products.

As prosperity increased around the world in recent decades, the number of people eating meat (and the amount one eats every year) has risen steadily. Between 1970 and 2002, annual per capita meat consumption in developing countries rose from 11 kilograms (24 lbs.) to 29 kilograms (64 lbs.), according to the FAO. (In developed countries, the

comparable figures were 65 kilos and 80 kilos.) As population increased, total meat consumption in the developing world grew nearly five-fold over that period.

Beyond that, annual global meat production is projected to more than double from 229 million tons at the beginning of the decade to 465 million tons in 2050. This makes livestock the fastest growing sector of global agriculture.

Animal-rights activists and those advocating vegetarianism have been quick to pick up on the implications of the FAO report.

"Arguably the best way to reduce global warming in our lifetimes is to reduce or eliminate our consumption of animal products," writes Noam Mohr in a report for EarthSave International.

Changing one's diet can lower greenhouse gas emissions quicker than shifts away from fossil fuel burning technologies, Mr. Mohr writes, because the turnover rate for farm animals is shorter than that for cars and power plants.

"Even if cheap, zero-emission fuel sources were available today, they would take many years to build and slowly replace the massive infrastructure our economy depends upon today," he writes. "Similarly, unlike carbon dioxide which can remain in the air for more than a century, methane cycles out of the atmosphere in just eight years, so that lower methane emissions quickly translate to cooling of the earth."

Researchers at the University of Chicago compared the global warming impact of meat eaters with that of vegetarians and found that the average American diet – including all food processing steps – results in the annual production of an extra 1.5 tons of CO₂-equivalent (in the form of all greenhouse gases) compared to a no-meat diet. Researchers Gidon Eshel and Pamela Martin concluded that dietary changes could make more difference than trading in a standard sedan for a more efficient hybrid car, which reduces annual CO₂ emissions by roughly one ton a year.

"It doesn't have to be all the way to the extreme end of vegan," says Dr. Eshel, whose family raised beef cattle in Israel. "If you simply cut down from two burgers a week to one, you've already made a substantial difference."

• *Staff writer Peter Spotts contributed to this report.*