

# SCIENTIFIC AMERICAN™

## How Does Meat in the Diet Take an Environmental Toll?

December 28, 2011



David Pimentel of Cornell University's College of Agriculture and Life Sciences says that the grain currently fed to some seven billion livestock in the United States could feed nearly 800 million people directly. Image: Digital Vision/Thinkstock

### **Dear EarthTalk: I heard that the less meat one eats, the better it is for the environment. How so?**

-- Jason K., Sarasota, FL

Our meat consumption habits take a serious toll on the environment. According to the Environmental Working Group (EWG), the production, processing and distribution of meat requires huge outlays of pesticides, fertilizer, fuel, feed and water while releasing greenhouse gases, manure and a range of toxic chemicals into our air and water. A lifecycle analysis conducted by EWG that took into account the production and distribution of 20 common agricultural products **found that red meat such as beef and lamb is responsible for 10 to 40 times as many greenhouse gas emissions as common vegetables and grains.**

Livestock are typically fed corn, soybean meal and other grains which have to first be grown using large amounts of fertilizer, fuel, pesticides, water and land. EWG estimates that **growing livestock feed in the U.S. alone requires 167 million pounds of pesticides and 17 billion pounds of nitrogen fertilizer each year** across some 149 million acres of cropland. The **process generates copious amounts of nitrous oxide**, a greenhouse gas 300 times more potent than carbon dioxide, while the **output of methane—another potent greenhouse gas—from cattle** is estimated to generate some **20 percent of overall U.S. methane emissions.**

**“If all the grain currently fed to livestock in the United States were consumed directly by people, the number of people who could be fed would be nearly 800 million,”** reports ecologist David Pimentel of Cornell University's College of Agriculture and Life Sciences. He adds that the seven billion livestock in the U.S. consume five times as much grain as is consumed directly by the entire U.S. population.

Our **meat consumption habits also cause other environmental problems**. A 2009 study found that **four-fifths of the deforestation across the Amazon rainforest could be linked to cattle ranching**. And the water pollution from factory farms (also called concentrated animal feeding operations or CAFOs)—whereby pigs and other livestock are contained in tight quarters—can produce as much sewage waste as a small city, according to the Natural Resources Defense Council (NRDC). Further, the **widespread use of antibiotics to keep livestock healthy** on those overcrowded CAFOs has led to the development of **antibiotic-resistant strains of bacteria** that threaten human health and the environment in their own right.

**Eating too much meat is no good for our health**, with overindulgence **linked to increasing rates of heart disease, cancer and obesity**. Worldwide, between 1971 and 2010, production of meat tripled to around 600 billion pounds while global population grew by 81 percent, meaning that we are eating a lot more meat than our grandparents. Researchers extrapolate that global meat production will double by 2050 to about 1.2 trillion pounds a year, putting further pressure on the environment and human health.

For those who can't give up meat fully, cutting back goes a long way toward helping the environment, as does choosing meat and dairy products from organic, pasture-raised, grass-fed animals. “Ultimately, we need better policies and stronger regulations to reduce the environmental impacts of livestock production,” says EWG’s Kari Hammerschlag “But personal shifting of diets is an important step.”

**CONTACTS:** EWG, [www.ewg.org](http://www.ewg.org); David Pimentel, [www.vivo.cornell.edu/entity?home=1&id=5774](http://www.vivo.cornell.edu/entity?home=1&id=5774); NRDC, [www.nrdc.org](http://www.nrdc.org).