





# An Inconvenient Food:

## The Connection Between Meat and Global Warming

BY MARISA MILLER WOLFSON

*"How about an environmental tax on meat like the one recommended on gasoline, or shifting farm subsidies to privilege plant agriculture over animal agriculture? Perhaps that would prompt Al Gore to overcome his own inconvenient love of burgers and produce [a sequel to his ill-informed documentary]."*

**O**VER THE PAST several months, Al Gore's Oscar-winning documentary, "An Inconvenient Truth," garnered a windstorm of media attention that likely sent people scurrying for fluorescent light bulbs to curb their carbon dioxide emissions, but some scientists have argued that the film does not paint a complete picture of the real causes of climate change, and it leaves out the most inconvenient truth of all: the connection between global warming and the steak knife.

Just four months before former Vice Pres. Gore gave his Academy Award acceptance speech, the United Nations Food and Agriculture Organization published a report that identified the number-one contributor to global warming. It was not transportation or power plants; it was livestock. Entitled "Livestock's Long Shadow," the report barely made a blip on the media's radar, perhaps because it uncovered a truth that was too inconvenient for most Americans, even Gore, to swallow. As a result, the American public missed out on one very effective strategy to combat climate change.

The livestock-global warming connection is nothing new to the scientific community. As "An Inconvenient Truth" was nearing its theatrical release in the spring of 2006, an issue of the journal *Earth Interactions* published a piece by Gidon Eschel and Pamela A. Martin from the Department of Geophysical Sciences at the University of Chicago. The assistant professors had conducted a study of the energy consumption and greenhouse gas emissions associated with food production. In their report, they point out that production of food in the U.S. requires increasingly more energy. In 2002, for example, 17% of all the fossil fuel

used in the U.S. went into food production, and that percentage rises by an average of one percent per year. Burning these fossil fuels emits more than three-quarters of a ton of carbon dioxide per person.

To find out which types of foods require the most fossil fuels and, as a result, release the most CO<sub>2</sub>, they considered five different diets. Each equaled 3,774 calories a day, and ranged from the average American diet to red meat, fish, poultry, and vegetarian diets. It came as no surprise to the researchers that the vegetarian diet ranked number one as the most energy-efficient, followed by poultry and the average American diet. It did come as a surprise, however, that fish almost was on a par with red meat as the least efficient—a large amount of fossil fuel is necessary for long-distance voyages to catch large predatory fishes such as tuna and swordfish. Moreover, salmon farming is not energy efficient.

To translate these results into everyday action, it would mean that, in order to curb the use of fossil fuels and the subsequent emission of CO<sub>2</sub> that results from their combustion, one need only adopt a vegan diet.

"Livestock's Long Shadow," meanwhile, outlines livestock's "enormous" contribution to climate change. Most people who have read the report were shocked to learn that 18% of the current global warming effect can be attributed to livestock—an even larger contribution than the transportation sector worldwide. Only nine percent of total carbon dioxide emissions are generated by livestock, but 37% of methane emissions and 65% of nitrous oxide—two powerful greenhouse gases—come from livestock. Moreover, some scientists would argue that it actually is the more potent

non-carbon dioxide greenhouse gases that are responsible for most of the global warming the world has experienced thus far.

In his report, "A New Global Warming Strategy" published by Earth Save International, physicist Noam Mohr refers to data by James Hansen, the "grandfather of the global warming theory." As director of NASA's Goddard Institute for Space Studies, Hansen has been quoted by Gore as well as other environmentalists, and is known as a man of sound science by global warming gurus such as James McCarthy, co-chair of the International Panel on Climate Change's Working Group II. Hansen's data suggests that many CO<sub>2</sub> emissions actually cool the atmosphere as well as warm it. To be specific, when cars and power plants—the primary sources of carbon dioxide emissions—release the gas, they simultaneously emit aerosols, which have a temporary cooling effect. These cancel out the warming of CO<sub>2</sub>, at least for the short term. For that reason, Mohr claims, most of the global warming we have seen up until now—and that we will witness in the near future—might not, in fact, be from the carbon dioxide emitted by cars and power plants.

You probably will not hear this information from environmental activists, though, because they would not want to give industries any excuse to lower regulations on CO<sub>2</sub> emissions. Furthermore, because the aerosols' cooling effect merely is temporary, CO<sub>2</sub> must be addressed for the long term. However, if predictions are true that we have only a few decades before the melting polar ice caps submerge Florida into the sea, then this issue should be addressed from all angles.

Much of the mass misconception about carbon dioxide has to do with numbers: humans produce more CO<sub>2</sub> than all of the greenhouse gases combined. However, what people might not realize is that, when it comes to global warming, it is not just about quantity of greenhouse gases, it also is about quality. For instance, methane is 23 times stronger than CO<sub>2</sub> in its warming effects; nitrous oxide, 296 times. Even though methane is weaker than nitrous oxide, the sheer amount of it in the atmosphere makes it a devastating greenhouse gas.

Animal agriculture plays the leading role in methane emissions, according to the United Nations report. It is responsible for 35-40% of all methane generated by human activity. Animal agriculture produces more than 100,000,000 tons of methane a year, and the figure is rising. As global demand for meat increases, so does the supply. From 1950-2002, world meat production went from 44,000,000 to 242,000,000 tons a year. Not only is the higher population driving the demand, people are consuming more meat individually. In the past 50 years alone, per capita consumption of meat has increased from 17 to 39 kilograms per person. As countries such as China and India adopt a more Western diet, demand for meat is rising rapidly, driving predictions that

global meat consumption will double again by 2020.

To compare which animal foods are the worst offenders, Eschel and Martin estimated that 56% of all non-CO<sub>2</sub> greenhouse gas emissions come from beef, 29% from dairy, and 15% from pork. This includes enteric fermentation, manure management, and nitrous oxide manure management. Most of the methane that is produced in animal agriculture comes from the digestive process of livestock, and most of that does not originate from the rear end of the animal, as one might expect, but rather from the front end during the benign act of exhalation. The amount of methane emanating from one cow may seem negligible, but when you consider that a single cow can exhale 634 quarts of methane per day and then multiply that by the 1,300,000,000 cows that are in the world today, it is not hard to see why this matter should be taken seriously.

### **Cess-pits of animal waste**

The initial production of methane that comes from digestion (85%) is followed by an additional emission (15%) from massive "lagoons," a euphemism for cess-pits of untreated farm animal waste. To get a sense of exactly how much waste we are talking about, consider that farm animals produce 500,000,000 tons of manure annually. That is three times more raw waste than is made by U.S. citizens, according to USDA figures. Waste disposal becomes problematic when the manure in the lagoons leaches into ground and surface water or spills directly into lakes, streams, and rivers. In fact, the Environmental Protection Agency estimates that chicken, hog, and cattle excrement has polluted 35,000 miles of rivers in 22 states and contaminated groundwater in 17 states.

Moreover, the amount of methane in the atmosphere has doubled since pre-industrial times. It does not help that human-produced methane stimulates the naturally produced variety. Microbial decay of organic matter in wetlands is the number-one source of natural methane. When temperatures in wetlands rise due to human-induced global warming, the organic matter in wetlands decays more, releasing even more natural methane. If we want to halt global warming in its tracks, why not reduce or eliminate the primary source of methane, the potent greenhouse gas that is causing much (if not most) of the global warming we are seeing today? Simply switching from a meat-based lifestyle to a pure vegetarian—or vegan—one is the easiest, most effective way to do this.

Not many people know that methane cycles out of the atmosphere after approximately 10 years, while CO<sub>2</sub> takes at least 100 years to do so. Given that the average methane-producing animal is only allowed to live for one or two years, if everyone went vegetarian today, it should take about 10 years for animal agriculture-induced methane emissions to disappear.

In contrast, even if affordable, zero-emissions cars and power plants were available today, it would take much longer for them to be built and then replace the older models. Meanwhile, you can walk into any supermarket and find vegetarian food.

It is too bad that those who are looking for ways to reduce their climate change footprint usually are not informed about the animal food-global warming connection. Environmental organizations should consider vegetarianism advocacy as a core part of their agenda and frame it in a way that people can relate to, as did Eschel and Martin in explaining that the food people eat is just as important as the type of cars they drive.

According to their data, even if you normally eat about eight percent fewer animal products than the average American, by going vegan you still can decrease your greenhouse gas emissions by the same amount as switching from a normal sedan to a hybrid—and if you eat about eight percent more animal products than the average American, by going vegan you reduce your greenhouse gas emissions by the same amount as switching from an SUV to a normal sedan. If more Americans heard the argument framed in this way, they might feel less inclined to bring their normal sedan into the drive-through at the local fast-food restaurant.

Finally, government policy should encourage vegetarian diets. Every five years, the USDA tells us what is best to eat in its "Dietary Guide for Americans." Since 1995, when vegetarianism was mentioned for the first time by name, the guidelines have pushed people more and more towards plant foods. In 2000, the guide urged, "Use plant foods as the foundation of your meals." Then, from 2000-05, the quantity of fruits and vegetables a person should eat every day increased from 2½ to 4½ cups. The daily intake of cholesterol (found only in animal foods), on the other hand, should not exceed 300 milligrams. That is the equivalent of just two small eggs. Try telling the average American that, after consuming two eggs sunnyside up for breakfast, he or she will be cut off from animal products for the rest of the day.

It seems that the USDA already knows that plants are good for our health, so putting more vegetarian-friendly policies into place will benefit the planet's health, too. How about an environmental tax on meat like the one recommended on gasoline, or shifting farm subsidies to privilege plant agriculture over animal agriculture? Perhaps that would prompt Al Gore to overcome his own inconvenient love of burgers and produce the sequel, "Meat: An Inconvenient Food." ★

*Marisa Miller Wolfson, outreach coordinator for Global Green Foundation, Santa Monica, Calif., a nonprofit organization dedicated to teaching people about healthy, eco-friendly, humane living, is the producer of the feature-length documentary, "Glass Walls."*