

Less Meat = Less Heat

Barbara: I saw a bumper sticker in the student parking lot this morning: “Less Meat = Less Heat.” Do you know what this means?

Regis: I was told it has to do with global warming. I believe singer Paul McCartney made this statement because he is concerned about the environment.



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B: Yes! Last December, he asked legislators at the “Global Warming Hearing” in Brussels, Belgium, to examine ways that individuals can reduce their impact on global warming. So, would eating less meat really prevent global warming?

R: Let’s talk about facts first. Solar radiation passes through the Earth’s atmosphere and is absorbed by the surface of the Earth, causing it to warm. Some of this energy then radiated away from the Earth.

B: In fact, if all of the sun’s energy was re-radiated, we would freeze!

R: Some of this re-radiated energy is absorbed by certain molecules present in our atmosphere, including carbon dioxide (CO₂), methane (CH₄), and nitrogen oxides (mainly NO and NO₂). These molecules are known as greenhouse gases, and the absorption process is referred to as the greenhouse effect because

it is similar to how a greenhouse works. But if the concentration of greenhouse gases in the air is too high, the Earth’s temperature could rise to dangerous levels.

B: Actually, that may be happening now. Scientists are worried that humans may be creating a runaway greenhouse effect. The carbon dioxide levels continue to

increase as we burn fossil fuels—coal, oil, and natural gas—to produce energy to drive our cars, cool and heat our buildings, and light our houses.

R: Yes, but we seldom consider the impact that meat consumption has on the production of greenhouse gases. Beef and lamb actually contribute the most.

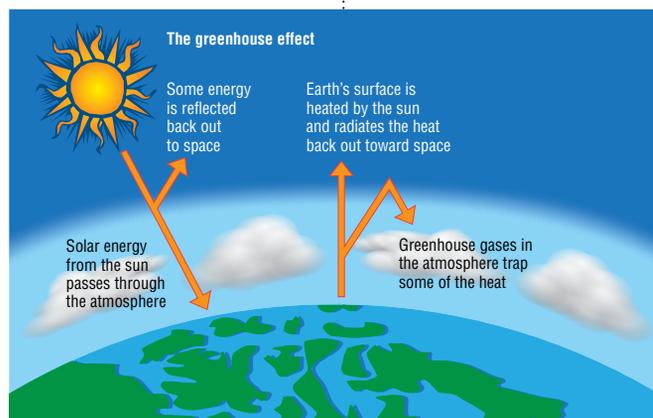
B: Wow! How can that be possible?

R: Actually, this carbon dioxide is produced indirectly. It comes from the fuel burned to operate farming equipment needed to grow feed, raise livestock, and transport it to market. A single cow can belch as much as 200 liters of methane per day. There are millions of cows in the United States, so the effect of this gas adds up quickly! Methane is also produced during the decomposition of livestock manure. Nitrogen oxides are emitted when nitrogen-based fertilizers break down in the soil. Livestock account for 9% of carbon dioxide emissions, 37% of methane emissions, and 35% of nitrogen oxide emissions worldwide.

B: And then, there is deforestation. Ranchers often cut down forests to increase space for livestock. Plants and trees, however, use atmospheric carbon dioxide to produce nutrients they need to grow. So, clearing woods for growing crops and livestock actually results in increased atmospheric carbon dioxide levels, because dead trees don’t use carbon dioxide.

expressed in terms of “carbon dioxide equivalent,” which is the annual amount of carbon dioxide that would have the same impact as all the greenhouse gases present.

B: The average carbon footprint in the United States is approximately 24 metric tons of carbon dioxide equivalent per person. For other industrialized countries, this number is



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R: So, there you have cows and sheep responsible for three of the worst greenhouse gases: carbon dioxide, methane, and nitrogen oxides. That’s the “Less Meat = Less Heat” connection.

B: The problem is that adults in developed countries eat about 1 kilogram, or 2.2 pounds, of meat a week! I don’t think many of us are willing to give up meat. But if every American gave up meat one day a week, it would be equivalent to taking more than 5 million cars off the road.

R: Giving up meat once a week is easy! One way we can determine our impact on the environment is to calculate our carbon footprint, which is a measure of the greenhouse gases produced by our daily activities. For simplicity, this is often

11 metric tons, and worldwide, the value is 5.5 metric tons. Since raising animals for meat increases greenhouse gas emissions, we can have a significant impact on our carbon footprint by reducing the amount of meat we consume. ▲

What is your carbon footprint? You can calculate it by going online at www.nature.org/initiatives/climatechange/calculator. Then send us your results to chemmatters@acs.org.

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