



## Cows in the Greenhouse

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Everything we do, everything that we own, everything that we buy or rent or grow, consume, or in some cases even contemplate, has a carbon footprint. Some things have larger footprints than others. SUVs have larger footprints than compact cars. “Green” products often have lower carbon footprints than those products that are not produced considering environmental factors first. Every dollar has a carbon value, and some dollars have a higher carbon value than others.

Goods made in China have a larger carbon footprint than the same goods made in the U.S. because per capita wages are very low there and, in general, lower technological manufacturing processes produce more pollution per unit of commerce. Transportation also plays a critical role in China and elsewhere. Vegetables grown in Brazil and flown to the U.S. have a larger carbon footprint than the same vegetables grown on the local produce farm and sold at the local market.

Washing a load of laundry about 1.5 pounds, drying that load is about 4.4 pounds, a beer is 1.8 pounds, a UPS package 4.7 pounds, a hot shower 3.5 pounds, a banana 0.25 pounds, a cup of coffee, 0.5 pounds and a hamburger is worth a little more than 17.5 pounds.

Why are burgers so carbon heavy? Some items have a larger footprint than others because of obvious reasons, but 17.5 pounds per burger? The biggest reason is that cows are huge emitters of methane, a greenhouse gas that is 23 times more potent than CO<sub>2</sub>. Methane lasts about 12 years in the atmosphere, then one molecule of methane turns into a little hydrogen and water and one molecule of CO<sub>2</sub>.

There are more cows on this planet than there are cars, more than two times as many cows as cars. Livestock pasture and farmland for feed production account for 30 percent of the entire land surface on this planet and 70 percent of the agricultural land. Livestock is responsible for 18 percent of the greenhouse gas emissions on Earth. This is more than the transportation sector at 27 percent. The United States alone accounts 37 percent of global pesticide use, 50 percent of antibiotic use, mostly for livestock, and 33 percent of the global nitrogen and phosphorus pollution of freshwater from fertilizers.

Cows emit 60 percent of the livestock share of 18 percent of all greenhouse gas emissions, or almost 11 percent of the world’s total of greenhouse gas emissions.

Transportation, cow feed, refrigeration, cucumber pickling, processing, cheese making, etc., required to create a burger, requires an average of 12 megajoules of energy. For every kilowatt hour of energy produced, 1.35 pounds of CO<sub>2</sub> is released. Converting megajoules to kilowatt hours at 1.35 pounds per kwh gives us another 4.5 pounds of CO<sub>2</sub>.

So the total footprint of a burger is 17.5 pounds of carbon.

The cement to CO<sub>2</sub> conversion is about 1:1 and concrete is about 12 percent cement, so the cement in a standard 94 pound sack of cement created 11.3 pounds of CO<sub>2</sub> when it was made.

When a burger is made, it creates one and a half times more CO<sub>2</sub> than a 94 pound sack of concrete.

References:

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- 3) Concrete Facts Sheet, National Ready Mixed Concrete Association, June 2008.
- 4) Carbon Dioxide Emissions from the Generation of Electric Power in the United States Department of Energy, Environmental Protection Agency, 2000.