Carbon Footprint of a Burger-Based Diet

A closer look into what is really in one of America's most loved food...

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The Big Picture

"Nothing will benefit human health and increase chances of survival of life on Earth as much as the evolution to a vegetarian diet" - Albert Einstein

Per capita meat consumption has more than doubled in the past half-century. Linked with global population growth, the overall demand for meat has increased five-fold. The meat industry has put a heavy demand on resources, limiting the availability of water, land, feed, fertilizer, and fuel. American fast food chains have thrived on the novelty of a classic burger. Long lines at the drive-thru highlight consumerism at its finest. However, does each consumer ever think of the environmental footprint that goes into creating that one burger patty?

Motivated by these problems, we want to "deconstruct" a meat-based burger in terms of water consumptions and greenhouse gas (GHG) emissions. We plan to look at beef, chicken, and soy- based burger patties, excluding the production of the additional burger toppings. From this research, we will construct a clear and digestible poster that delivers the hard facts on the US' meat industry in an easy-to-swallow manner. In the process, we hope to shed light on the extremely unsustainable meat industry so that consumers may rethink their dietary choices and reduce meat consumption.

Water Facts

H_2O usage (in gallons) for a ¼ lb. burger patty

Beef	**450**
Chicken	**120**
Tofu	**75**

Here's the Math

Beef	Chicken	Tofu
We know that ¼ lb of beef has a CO_2 equivalent of 2040 grams. We also know that the average American eats 0.22 lbs of beef per day.	We know that ¼ lb of chicken has a CO_2 equivalent of 370 grams. Assuming that the average american eats 0.23 lbs of chicken per day.	We know that ¼ of tofu has a CO_2 equivalent of 227 grams. We also know that the average american eats 0.001 lb of tofu per day. For this study, we suggest the average American eats 0.22 lbs per day.
-------	Patty weight = 0.25lbs / patty	-------
We want to figure out how much GHG emissions are produced if you ate the average amount of beef for a day. Avg. beef / patty weight x beef CO_2 (0.22 lbs / 0.25) x 2040 grams CO_2 e **=1, 795.2 grams CO_2 e per capita per day**	We want to figure out how much GHG emissions are produced if you ate the average amount of chicken for a day. Avg. chicken / patty weight x chicken CO_2 (0.23 lbs / 0.25) x 370 grams CO_2 e **=340.4 grams CO_2 e per capita per day**	We want to figure out how much GHG emissions are produced if you ate the average amount of tofu for a day. Suggested tofu / patty weight x tofu CO_2 (0.22 lbs / 0.25) x 227 grams CO_2 e **=199.76 grams CO_2 e per capita per day**

So, if you switched from beef to tofu for *just one day*, you would save:
1,795.2 grams CO_2 e - 199.76 grams CO_2 e = 1,595.44 grams CO_2 e

That's a lot! Imagine how much you could save if you participate in the Meatless monday challenge for a year!
(1,795.2 + 340.4 - 199.76) x 52 day/year = 100.663.68 CO_2 e grams per per year saved!

According to Indonesia's Agency for the Assessment of Application of Technology (BPPT), Indonesian tofu makers are launching a pioneer program to generate biogas through filtering the wastewater from the soy production. This particular project is projected to reduce greenhouse gas emissions by 26 percent by 2020.

Not all burgers (or GHGs) are created equal!

Carbon dioxide equivalent (CO2e) in grams for a ¼ lb. burger patty

Chicken Patty

374 CO2e

Beef Patty

2040 CO2e

Tofu Patty

227 CO2e

http://static.ewg.org/reports/2011/meateaters/pdf/methodology_ewg_meat_eaters_guide_to_health_and_climate_2011.pdf

Findings

Based on our research, we found that the ranking order from most to least harmful in terms of GHG emissions and water usage is as follows:

beef > chicken > tofu

We must be mindful of our consumptive habits and hidden energy expenses in our daily diets.

What's next?

- Try Meatless Mondays (or Tuesdays, Wednesdays or Thursdays…)
- Political action to reduce artificially low prices of meat
- Reduce food waste
- Push for transparency in the agriculture industry
- Search for your own sustainable dietary practices!