

Carbon savings that could be achieved in the USA through a reduction in meat consumption

CARBON SAVINGS USA		
Days per week no meat	CO ₂ in Megatons per annum	If all Americans ate no meat for days a week
1 day	99,6	This would result in the same carbon savings as taking 19.2 million cars off the road in the USA for a year long.
		If all Americans did not eat meat for one day a week, they would save 99.6 megatons of greenhouse gas emissions. This would save 46 million return flights from New York to Los Angeles and back from Los Angeles to New York.
2 days	199.2	If everyone in the US did not eat meat for two days a week, they would save 199 megatons of greenhouse gas emissions. This would have the same positive effect on reducing greenhouse gases as <u>replacing ALL household appliances</u> in the US with energy efficient ones.
3 days	298.6	If all Americans did not eat meat for three days a week, they would save almost 300 megatons of greenhouse gas emissions. This would have a greater impact on the climate than <u>replacing all</u> US cars with Toyota Prius models.
4 days	398.4	If everyone in the US did not eat meat for four days a week, they would save 398 megatons of greenhouse gas emissions. This would result in carbon savings equivalent to <u>halving</u> the domestic use of all electricity, gas, oil, petroleum and kerosene in the United States.
5 days	498	If all Americans abstained from eat meat for five days a week, they would save 498 megatons of greenhouse gas emissions. This would result in carbon savings equivalent to planting 13 billion trees in your garden and letting them grow for ten years. That is 43 trees per American!
6 days	597.6	If all Americans did not eat meat for six days a week, they would save nearly 600 megatons of greenhouse gas emissions. This would lead to the same carbon savings as eliminating the <u>total</u> electricity use of all households in the United States.
7 days	697.2	If everyone in the United States ate a vegetarian diet for seven days , they would save around seven hundred megatons of greenhouse gas emissions. That would be just the same removing <u>all</u> of the cars in the USA off the roads.

Data for calculations for cars:

- 303,480,824 Americans (US census Bureau)
- A car drives an average of 12.000 miles, or 19.300 km (1 mile = 1.61 km) (United States Department of Transportation - Federal Highway Administration, 2001 & Office of Transportation and Air Quality (OTAQ), EPA, 2005)
- The emissions created by the average American car are 5.2 ton CO₂e per annum, or 270 g per kilometre (US-EPA, 2005)
- The average American eats meat every day. By not doing so, he would save 2.3 tons a year, or 2300 kilos
- For the entire US, this is therefore: $2,3 \times 303.000.000 = 697$ Megatons. Note from Dutch researchers: the University of Chicago researchers assumed that an American who made the transition to a vegetarian diet would save 1500 kg CO₂, an American who swapped his car for a Prius: 1000 kg. Our calculations arrive at a slightly higher figure, but they are also to a large extent based on the FAO statistics from 2006; Eshel and Martin's paper was from 2005. The order of size is, however, correct.
- 1 day less meat thus comes to 99.6 megatons ($697.2 / 7$ days)
- This boils down to 19.2 million cars being taken off the road ($99.6 / 5,2$ ton per car)
- In 7 days without meat, you would save as much as the emissions from all private cars in the US (135 million cars divided by 19.2 million is 7.03 days) (United States Department of Transportation - Federal Highway Administration)

Emission statistics derive from fueleconomy.gov, an initiative of the US Department of Energy and US EPA.

Hummer, SUV en Prius

- A Toyota Prius (the most energy efficient car on the market) emits 3.2 tons of CO₂ a year. A Hummer (Model H3) emits 10.5 tons. The difference is thus 7.3 tons per annum. In the US, a vegetarian saves 2.3 tons a year. How can a vegetarian then be more environmentally friendly? Kim indicates that the comparison applies to a SUV and a Prius, but not to the Hummer. In the calculation below, we show that if ALL Americans stopped eating meat, there would still not be as much saved as the Hummer-Prius option. One can, however, say that a vegetarian in a medium-sized car (5.2 ton) saves more than a meat-eater in a Prius ($3,2 + 2,3 = 5,3$ ton)
- As noted above, the average American car emits 5,2 tons, which means that replacing all cars with a hybrid Prius creates a saving of 135 million cars \times 2 ton CO₂ = 270 megaton. (difference between the Prius of 3.2 and an average car of 5.2)
- Eating less meat for three days a week thus results in as much as replacing half of all cars with Prius models.
- If all cars were Hummers (135 million) times 10.5 tons emissions, then the total emissions would be 1417.5 megatons. Prius models alone would result in 432 megatons. The difference is 985.5 megatons. Thus this is more than the 697.2 savings of the vegetarian. Could we then prove the Hummer vegetarian vs Prius meat eater? No, but we could look at a BMW X3, which emits exactly that difference (7.3 tons per year). This, however, only applies if the whole country went vegetarian!

US Climate Policy.

- The US does not have any real reduction goals. They do have a goal with respect to the CO₂ intensity of their economy: Meeting this commitment will prevent the release of more than 100 million metric tons of carbon-equivalent emissions to the atmosphere (annually) by 2012 and more than 500 million metric tons (cumulatively) between 2002 and 2012 (Executive Office of the President of the United States, Council on Environmental Quality).

Assumptions energy saving bulbs

- According to the US EPA, using an ENERGY STAR Lamp of 25 watts (more widespread than energy saving bulbs in the US) instead of an ordinary light bulb saves an average of 75% CO₂. The average CO₂ domestic emissions are 7.4 tons per year per household (EPA). 20% of this is 1.48 tons and the savings of replacing all bulbs with energy efficient ones is thus $1.48 \times 75\% = 1.11$ ton per year. There are 114 million households in the US (US Census Bureau), therefore the total domestic savings are 126 megatons.

Assumptions plane tickets

- Return New York – Los Angeles costs 2160 kg (atmosfair.de. Based on IPCC emissions from aviation) In six days per American you can save as much CO₂ as is created by a return from New York to Los Angeles.