

# Understanding Your Carbon Footprint

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# Carbon Footprint or Carbon Shadow?



- “ecological footprint” refers to a specific analysis pioneered by Wackernagel and Rees (1996)
- “carbon footprint” is a less standardized term

“The total set of GHG (greenhouse gas) emissions caused directly and indirectly by an individual, organization, event or product” (UK Carbon Trust 2008, *Carbon Footprinting*)

# Don't Count Heads...

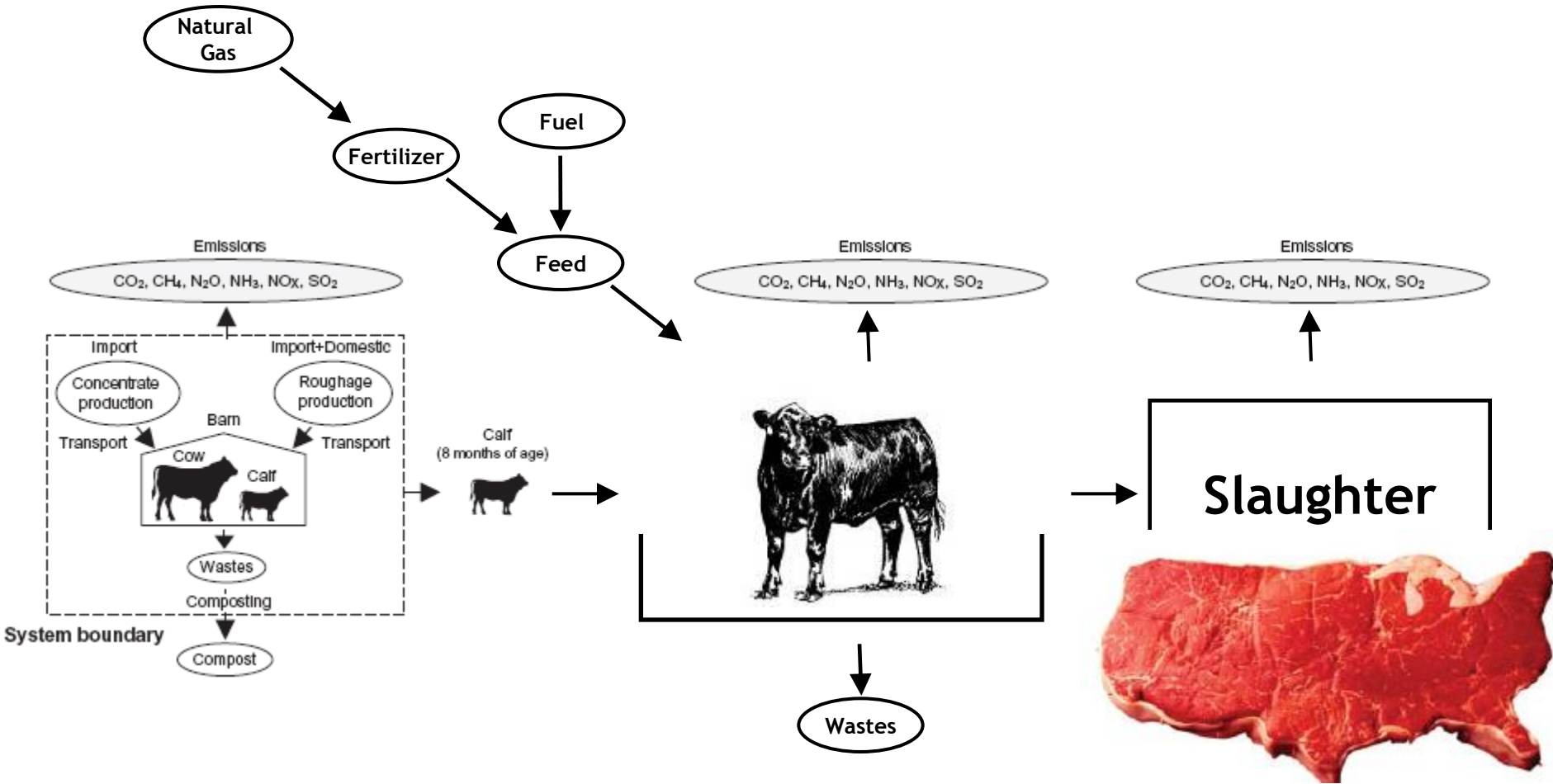
## Measure the Size of the Feet

- Add up human impacts and demand for ecological services and express them in terms of space.
- How much of nature, in units of “bioproductive” space with world average productivity, is used exclusively to make a certain product or meet a specific need?

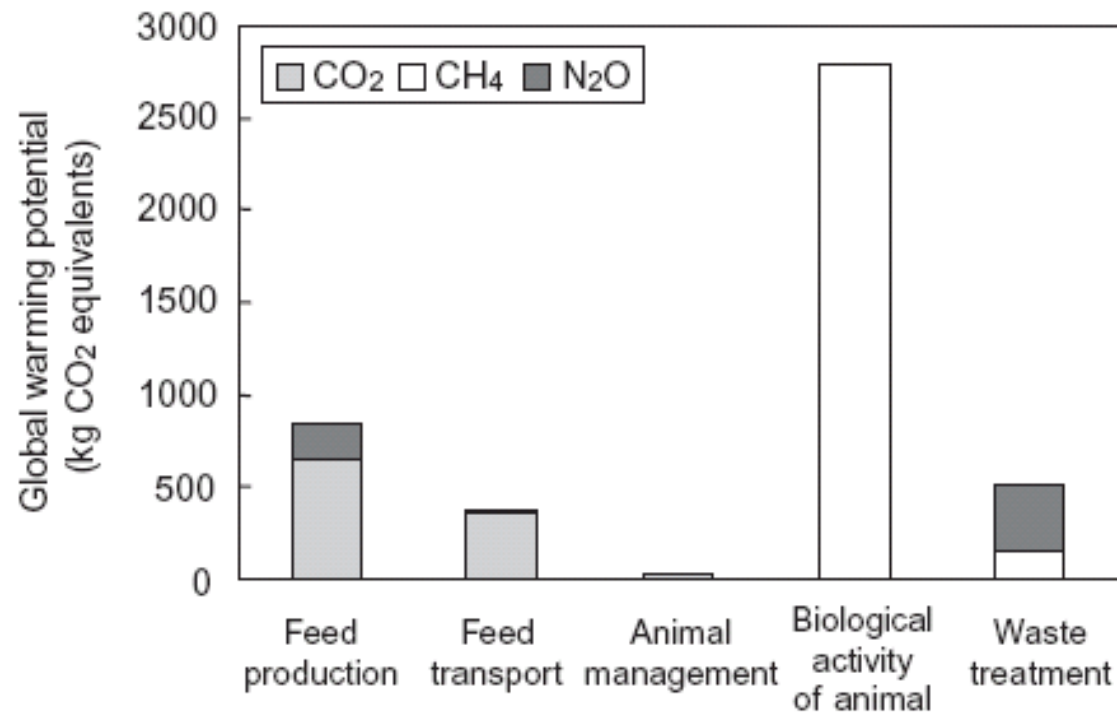
*The problem with land is that they stopped making it some time ago*

– Mark Twain –

# Setting System Boundaries



# “Global Warming Potential” for Japanese Cow Calf Operation

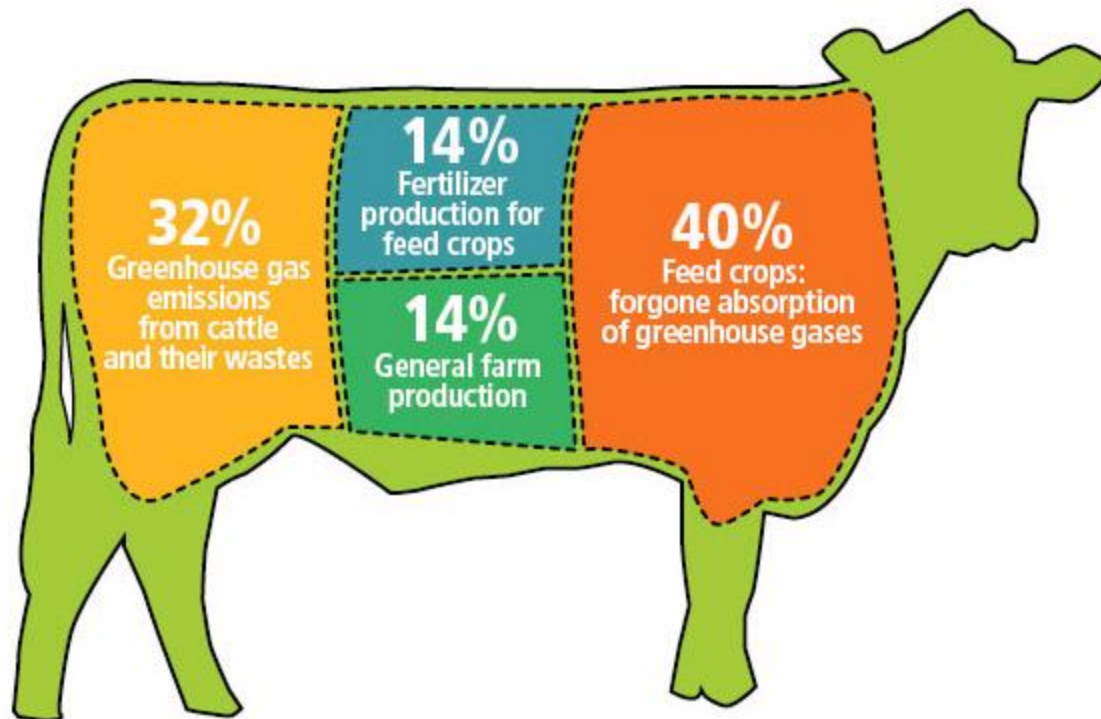


Source: Ogino et al. *Animal Science Journal* (2007) 78: 424–432.

# Land Use Change: Expanding the Boundary (pushing the envelope?)

- What if the farm land that was used to grow the feed had never been tilled?
  - Carbon was released when the sod was broken
  - Less carbon is absorbed by forage and grain crops than native perennial grasses or forest
- Indirect Land Use Change (iLUC)

# GHG Footprint of Beef

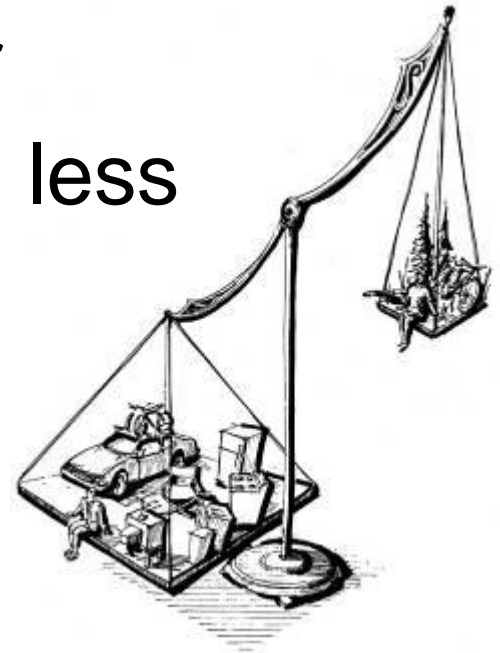


Assumes that 1,000 kilograms of carbon per hectare per year would have been absorbed by forests or other vegetation if land had not been cleared for annual food crops or fodder.

Source: N. Falia *Scientific American* (2009) Feb. 72-75;  
based on work of Subak S. *Ecological Economics* (1999) 30: 79–91.

# Making Comparisons

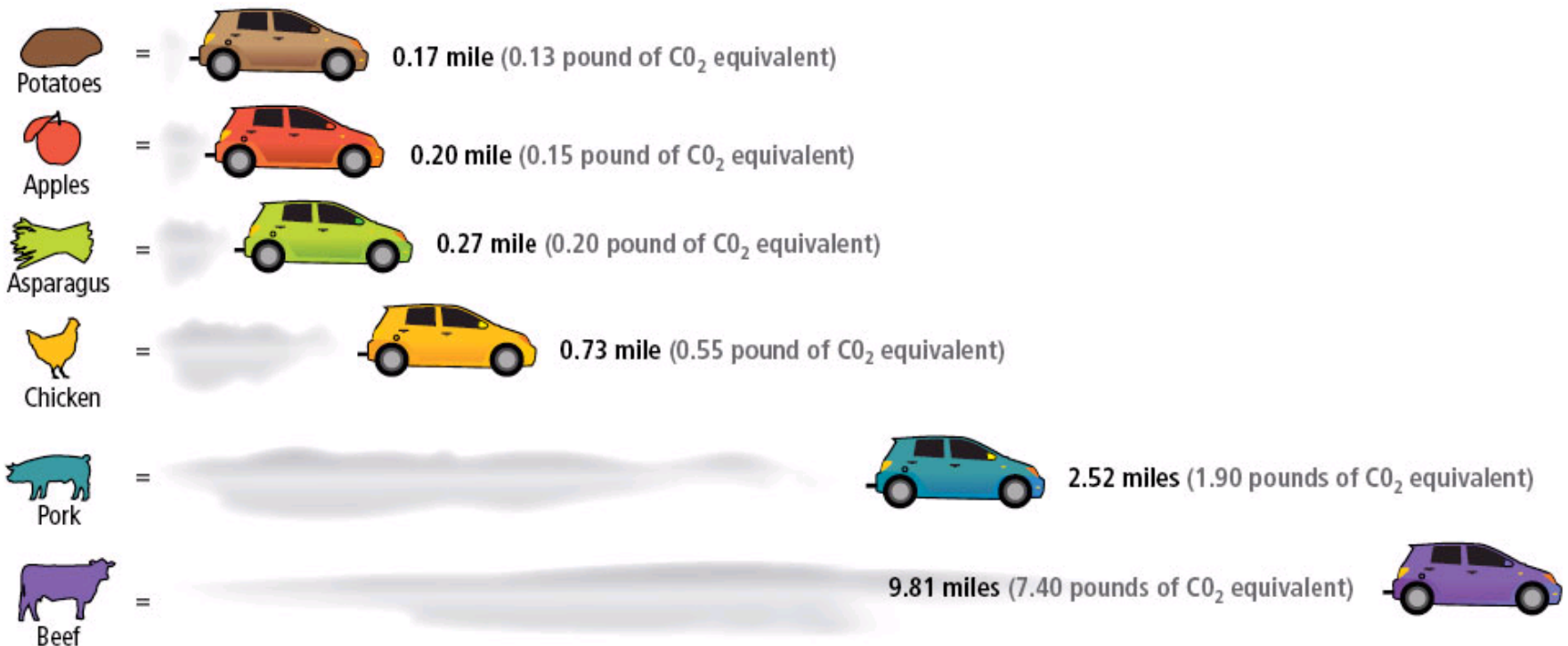
- Comparisons between different foods on a carbon footprint basis ignore:
  - differences in nutritional quality
  - differences in value to consumer
- Other comparisons make even less sense



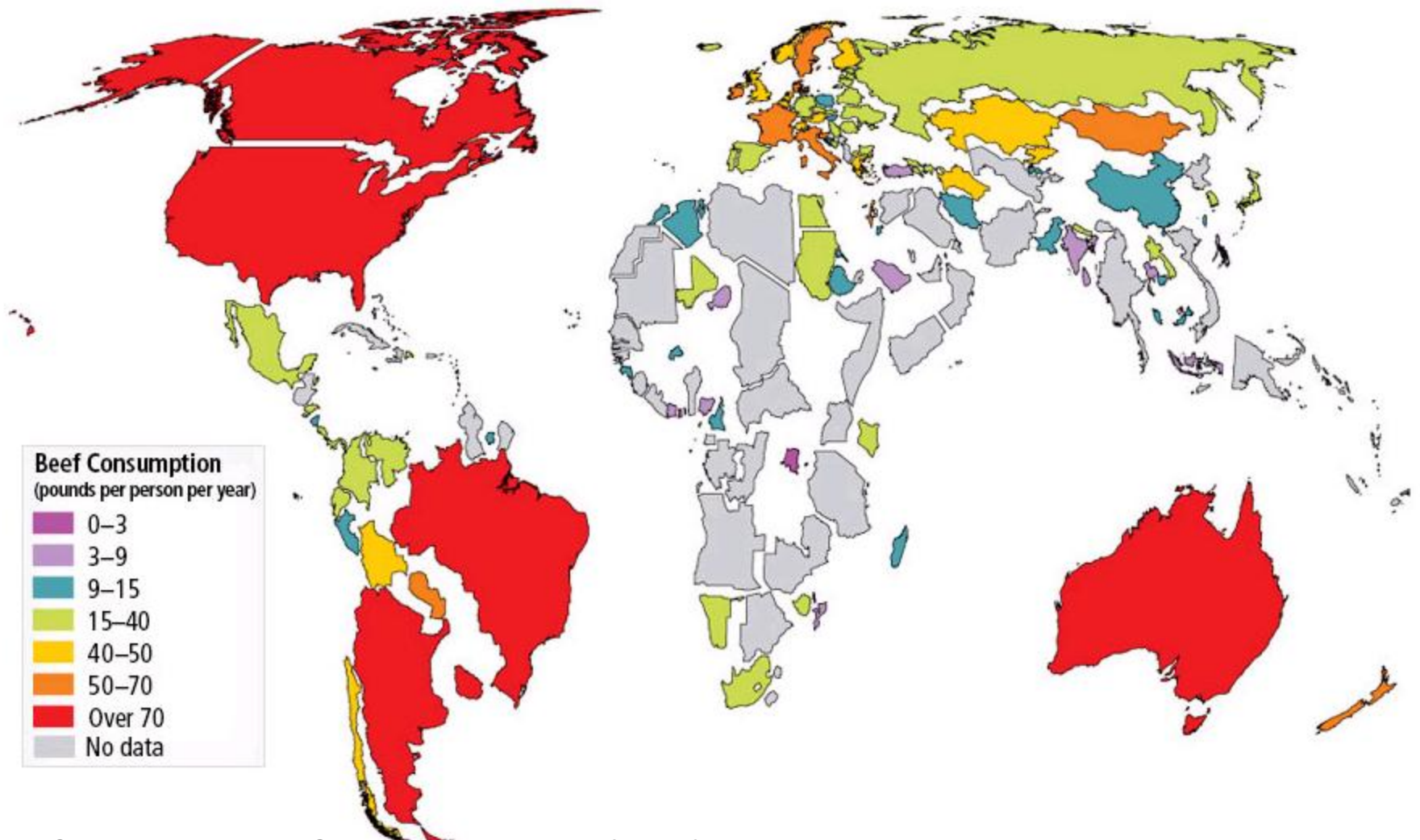


# Comparing Carbon Footprints of Foods and a 27 mpg Automobile

CO<sub>2</sub>-equivalent emissions from producing half a pound of this food ... are the same as emissions from driving ...



# World Beef Consumption



Source: N. Falia *Scientific American* (2009) Feb. 72-75;  
based on Steinfeld et al. (2006) .

# Carbon Policy Is Coming (?)

- USDA Office of Ecosystem Services and Markets
  - GHG emissions are first target
- Cap-and-Trade Bills introduced in U.S. Congress
- International carbon policies impacting export / import



"Methane emissions from beef cattle are declining, thanks to innovations in feeding practices," says Karen Batra of the National Cattlemen's Beef Association in Centennial, Colorado.

"Everybody is trying to come up with different ways to reduce carbon footprints," says Su Taylor of the Vegetarian Society in the UK: "But one of the easiest things you can do is to stop eating meat."

As quoted in: Fanelli, D. Meat is Murder on the Environment, *New Scientist*, 18 July 2007.



Questions?

# References

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