

CORNHUSKER ECONOMICS

Putting Your Car Where Your Mouth Is: Diets and Carbon Emissions

Market Report	Yr Ago	4 Wks Ago	4/18/14
<u>Livestock and Products,</u>			
<u>Weekly Average</u>			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight.....	\$126.11	\$152.50	\$146.00
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb.....	162.72	221.82	220.06
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb.....	136.66	179.37	183.87
Choice Boxed Beef, 600-750 lb. Carcass.....	190.51	242.41	224.27
Western Corn Belt Base Hog Price Carcass, Negotiated.....	78.11	125.62	116.24
Pork Carcass Cutout, 185 lb. Carcass, 51-52% Lean.....	83.26	129.14	120.60
Slaughter Lambs, Ch. & Pr., Heavy, Wooled, South Dakota, Direct.....	115.00	155.00	134.00
National Carcass Lamb Cutout, FOB.....	288.29	371.16	369.64
<u>Crops,</u>			
<u>Daily Spot Prices</u>			
Wheat, No. 1, H.W. Imperial, bu.....	6.99	7.22	6.69
Corn, No. 2, Yellow Nebraska City, bu.....	6.66	4.39	4.64
Soybeans, No. 1, Yellow Nebraska City, bu.....	14.33	13.84	14.79
Grain Sorghum, No. 2, Yellow Dorchester, cwt.....	11.21	7.89	7.98
Oats, No. 2, Heavy Minneapolis, MN, bu.....	4.25	4.47	4.48
<u>Feed</u>			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton.....	245.00	182.50	200.00
Alfalfa, Large Rounds, Good Platte Valley, ton.....	227.50	127.50	115.00
Grass Hay, Large Rounds, Good Nebraska, ton.....	222.50	107.50	107.50
Dried Distillers Grains, 10% Moisture, Nebraska Average.....	239.50	235.00	235.00
Wet Distillers Grains, 65-70% Moisture, Nebraska Average.....	91.50	95.75	68.00
+ No Market			

In an effort to broaden the focus of sustainability research from work on sustainable production that aims to influence farmer decisions when producing food, to research about sustainable consumption that aims to influence consumer decisions when buying food, we embarked on a research project that looks at environmental and health impacts of dietary choices. In this article, results from some initial work on the environmental impact are reported. Specifically, the energy efficiencies and consequent carbon emissions of the average United States, Japanese, Mediterranean, French and Nordic diets are compared. To put the results in perspective, the carbon emissions were converted into equivalent driving miles.

Figure 1 (on next page) presents the composition of the average French, Japanese, Mediterranean, Nordic and U.S. diets in 2009, measured in kilocalories (kcal). The red and green areas represent the animal-based kcal and the plant-based kcal, respectively. The total amount of kcal consumed is at the top of each bar. The average U.S. diet contains the most calories (3,688/kcal/capita/day), though the Mediterranean and French diets represent similar consumption levels. With the exception of the average Japanese diet (2,723/kcal/capita/day), the rest of the diets are all above 3,000 kcal.

The energy efficiency, defined as the ratio of the amount of energy in a food to the amount of energy required to produce the food for each of the five diets, was calculated using data from Pimentel and Pimentel (2008) and the U.S. Department of Agriculture (2013). We found that the most energy efficient diet is the Mediterranean diet, followed by the Japanese, U.S., French and Nordic diets (see Table 1, first numeric column, on next page).

The second numeric column of Table 1 converts the energy efficiencies into CO₂ emissions. The ranking of diets in terms of CO₂ emissions are the same as those in terms of energy efficiencies. The Mediterranean diet had the lowest

annual emissions level at 0.388 tons of CO₂ per capita; yet the Mediterranean diet is characterized by 23 percent animal-based products, moderately higher than the Japanese diet's 21 percent. This reveals that a larger percentage of animal-based products in a country's diet does not necessarily translate into larger CO₂ emissions; one must also consider the mix of the animal products consumed.

The last column in Table 1 translates CO₂ emission levels into equivalent per capita annual driving miles, a more common measurement tool for emissions. Consuming an average U.S. diet is equivalent to driving 970 miles annually, farther than consumers of the Mediterranean and Japanese diets, but fewer than consumers of the Nordic and French diets.

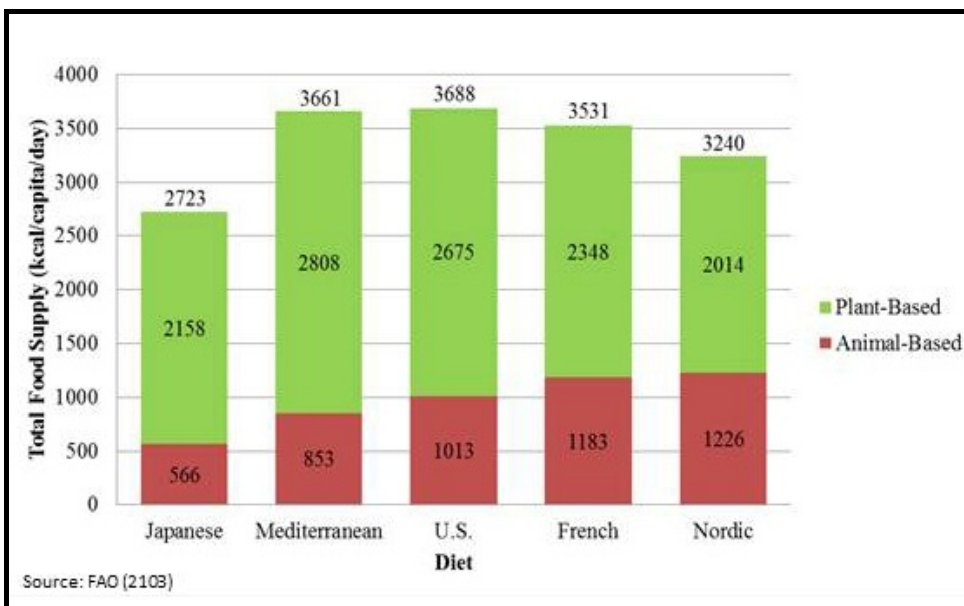


Figure 1. Diet Compositions

Table 1. Energy Efficiency and Per-Capita Emissions in Tons of CO₂ and Driving Miles

Diet	Energy Efficiency	Emissions in Tons of CO ₂ (per capita per year)	Emissions in Driving Miles (per capita per year)
Mediterranean	1.26	0.388	917
Japanese	1.28	0.394	931
U.S.	1.34	0.410	970
French	1.58	0.484	1,144
Nordic	1.69	0.518	1,225

SOURCE: Calculated by the authors using data from Pimentel and Pimentel (2008); U.S. Department of Agriculture (2013); U.S. Department of Energy; and U.S. Environmental Protection Agency (2011).

Two implications were drawn from the results. The first is that targeted changes in dietary composition could be a means to achieving sustainable consumption through mitigation of CO₂ emissions. The second is that a larger percentage of animal-based products in a country's diet does not automatically mean it is less environmentally friendly; the mix of the animal products consumed must be taken into account.

References:

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