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**Food choices and environmental impact: Meat and plant based diets**

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People have many reasons for choosing what to eat. We may prefer the familiar foods we were raised with (“comfort food”). Some of us are drawn to foods that are highly advertised in the media and readily available. Or we may be drawn to trendy foods that are featured at restaurants and that mark us as sophisticated eaters. Many vegetarians choose their diets out of ethical concern for the lives of animals. Probably, most of us do not choose what we eat with an awareness of how our choices affect the environment and, in particular, the climate crisis. While food choices are a deeply individual matter, the collective impact of our decisions about what to eat is greater than many people realize.

All food is ultimately “solar powered” in that its availability can be traced back to living beings’ ability to make use of the sun’s energy. But whether a particular food is more closely or more distantly related to the sun’s energy can make an enormous difference in how the consumption of that food affects the environment. As a general rule, eating foods that are produced directly through photosynthesis (plants) will require less total energy than will eating foods that are produced by animals who eat plants (meat, milk, eggs). So, one common sense rule of thumb would be that eating a plant-based diet has less of an impact on the environment than eating a meat-based diet. While this rule of thumb is in general a good guide to lowering the environmental impact of our eating choices, the environmental consequences of food choices are actually more complicated than that. For both plant and animal foods it matters considerably where and how the food is produced. Plant foods that are raised with heavy use of fossil-fuel based fertilizers, cultivated with fossil-fuel run equipment, heavily processed, and transported long distances can have a significantly negative impact on the environment, whereas local pastured meat produced according to sustainable practices can enhance the environment through improvements to soil and water quality.

**Impact of Conventional Meat Production**

- Currently, 1/3 of the world’s grain harvest (including 50% of corn and 90% of soybeans) are not consumed directly by humans but are used for animal feed on factory farms.<sup>1</sup>
- These grain crops are primarily grown on large scale, mono-crop farms, highly dependent on fossil-fuel based fertilizers.<sup>2</sup>
- On average, it takes 6 kilograms of plant protein to produce 1 kilogram of animal protein. For beef the ratio is 40 to 1; for pork 14 to 1; for chicken 4 to 1.<sup>3</sup>
- To produce 1 kilogram of animal protein requires about 100 times more water than to produce 1 kilogram of grain protein.<sup>4</sup>
- The current system of livestock production accounts for 37% of methane and 65% of nitrous oxide emissions, two of the most potent greenhouse gases.<sup>5</sup>
- The manure holding pits (“lagoons”) of CAFOs (concentrated animal feedlot operations) break down organic matter without oxygen, a process that speeds the entry of methane and carbon dioxide into the atmosphere.<sup>6</sup>

For consumers who want to lower the environmental impact of their food choices, several strategies are possible:

- Reduce the amount of conventionally raised animal protein in your diet, substituting plant-based protein.
- Choose grass-fed or pastured meats. Grass-fed beef requires half the energy input as grain-fed beef and produces significantly less greenhouse gases.<sup>7</sup> Buying locally produced meats reduces the carbon emissions used in transportation.
- Choose meats that are more efficiently produced in terms of energy inputs (for instance, chicken rather than beef).
- For plant based diets, choose organic and sustainably grown foods, which are produced without petroleum-based fertilizers and pesticides.<sup>2</sup> Organic corn requires 1/3 less energy per acre to grow.<sup>8</sup>
- Choose local, organic, and sustainably grown fruits and vegetables to minimize emissions from transportation.

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<sup>1</sup>Rajendra Pachauri, "Global Warning: The Impact of Meat Production and Consumption on Climate Change" (paper, Compassion in World Farming, London, September 8, 2008).

<sup>2</sup>Anna Lappé, *Diet for a Hot Planet*, (New York: Bloomsbury USA, 2010), 14 and 208.

<sup>3</sup>David Pimentel and Marcia Pimentel, "Sustainability of Meat-based and Plant-based Diets and the Environment," *The American Journal of Clinical Nutrition* 2003; 78 (suppl): 661S-662S.

<sup>4</sup>Pimentel and Pimentel, 662S.

<sup>5</sup>Henning Steinfeld et al., *Livestock's Long Shadow*. (<http://www.fao.org/docrep/o10/a0710e/a0710e00.HTM>), 112, 114.

<sup>6</sup>P. Smith et al., "Agriculture," in O. R. Davidson et al., eds, *Climate Change: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge, UK: Cambridge University Press, 2007), 511.

<sup>7</sup>Meredith Niles, "Sustainable Soils: Reducing, Mitigating, and Adapting to Climate Change with Organic Agriculture," *Sustainable Development Law and Policy*, 2008: 20. H. A. DeRamus et al., "Methane Emissions of Beef Cattle on Forages: Efficiency of Grazing Management Systems," *Journal of Environmental Quality* 32 (2003).

<sup>8</sup>David Pimentel, *Impacts of Organic Farming on the Efficiency of Energy Use in Agriculture* (Ithaca, NY: Organic Center, 2006), 9.