U.S. Food System

Americans enjoy a diverse abundance of low-cost food, spending a mere 10% of disposable income on food. However, store prices do not reflect the external costs — economic, social, and environmental—that impact the sustainability of the food system. Considering the full life cycle of the U.S. food system illuminates the connection between consumption behaviors and production practices.

Patterns of Use

Agricultural Production
- Farmers account for 1% of the population. Almost 28% of these farmers are between the ages of 55 to 64.
- Large-scale family farms account for only 2.5% of all farms, but 39% of production. Small-scale family farms account for only 26% of production, but represent 89% of U.S. farms.
- Just 14.6¢ of every dollar spent on food in 2017 went back to the farm; in 1975, it was 40¢.
- In 2012-2014, 47% of the hired agricultural labor force lacked authorization to work in the United States.
- From 1992 to 2012, total cropland decreased from 460 million acres to 392 million acres.
- Many parts of the U.S., including agricultural regions, are experiencing increasing groundwater depletion (withdrawal exceeds recharge rate).
- In 2015, 132 million acre-feet of water were used for irrigation - 52% of this water came from surface-water sources.
- In 2017, the amount of irrigated farmland in the U.S. was over 58 million acres, more than 2 million more acres than 2012.
- Nutrient runoff from the upper agricultural regions of the Mississippi River creates a hypoxic “dead zone” in the Gulf of Mexico. 2017 hypoxic dead zone was the largest measured since 1985, at 8,776 sq mi.
- Although pesticide use declined 1.4% annually from 1996 to 2007, herbicide use increased significantly during the same period.
- Decreased pesticide use is due in part to widespread deployment of genetically engineered crops.
- In 2008, the U.S. agriculture sector used 516 million pounds of pesticides.
- The Food and Agriculture Organization of the UN estimates a loss of 75 billion tonnes of soil are eroded yearly on agriculturally fertile lands.
- Agriculture was responsible for 8.4% of total U.S. greenhouse gas emissions in 2017. CH4, N2O, and CO2 are the main greenhouse gasses emitted by agricultural activities. Livestock and soil management are major contributors.

Consumption Patterns
- In 2010, the U.S. food supply provided 4,000 calories per person per day. Accounting for waste, the average American consumed 2,507 calories per day in 2010, an increase of 22% from 1970.
- In 2016, 196 lbs of meat per person were available for consumption, up more than 25 lbs from 1965. Although red meat consumption declined almost 30% since 1970s, chicken consumption increased steadily.
- 32% of grains grown are used to feed animals.
- About 22.8 teaspoons of sweeteners are available per capita in the US daily; the American Heart Association recommends limiting added sugars to 6 and 9 teaspoons daily for average females and males, respectively.
- More than 70% of U.S. adults are overweight/obese (BMI > 25), and 20% of those age 12-19 are overweight/obese.
- Diet plays a significant role in health; diets lacking fruits and vegetables can increase risk of heart disease, certain cancers, and stroke—leading causes of U.S. deaths.
- The EPA estimated that in 2010, 31% of the food supply was lost, 50% more than in 1970. In 2015, more food reached landfills than any other material. This waste accounts for roughly 15% of the municipal solid waste stream and represents a loss of $450 per person each year. One estimate suggests that 2% of total annual energy use in the U.S. is used to produce food that is later wasted.
Life Cycle Impacts

The energy used by a system is often a useful indicator of its sustainability. Food-related energy use accounts for nearly 16% of the national energy budget. Agriculture and the food system as a whole have developed a dependence on fossil energy; 13 units of (primarily) fossil energy are input for every unit of food energy available. The production of US self-selected diets amount to 4.7 kgCO2 eq. and 25.2 MJ non-renewable energy demand per capita per day. Reliance on fossil fuel inputs makes the food system increasingly vulnerable to oil price fluctuations. Consolidation of farms, food processing operations, and distribution warehouses often increases distance between food sources and consumers. Consolidation in the food system is also concentrating management decisions into fewer hands. For example: Four firms control 8% of the beef packing market; 82% of soybean processing is controlled by 4 firms. The top four food retailers sold almost 45% of America’s food in 2016, compared to only 17% in 1993.

Solutions and Sustainable Alternatives

Eat Less Meat

Meat-based diets use more energy to produce than vegetarian diets, one study suggests twice as much. One serving of beef has more associated greenhouse gas emissions than 20 servings of vegetables. Meat production as it is widely practiced today also has significant environmental impacts on land use, water use and water pollution. 20% of Americans cause half of the food-related GHG emissions; a diet shift away from meat could reduce this, with some studies estimating reductions of up to 73%.

Reduce Waste

Much of household food waste is due to spoilage. Prevent food from going bad by buying smaller amounts; planning meals and sticking to shopping lists; and freezing, canning, or preserving extra produce. Direct-to-consumer meal kits are growing in popularity. By streamlining the supply chain, and reducing food waste and last-mile transportation, meal kits are responsible for 25% lower GHG emissions lower than a store bought meal. Many foods that are still safe are thrown out due to confusion about “sell-by” and “use-by” dates. For further information on food product dating, see the USDA’s Food Safety and Inspection Service.

Use Less Refrigeration

Home refrigeration accounts for 13% of all energy consumed by our food system. Today’s convenience foods rely heavily on refrigeration for preservation. Consider a smaller, more efficient refrigerator and buying smaller quantities of fresh produce more frequently. Refrigerator efficiency more than doubled from 1977 to 1997, but increases in size have largely offset this improvement.

Eat Organic

Organic farms don’t use chemicals that require large amounts of energy to produce, pollute soil and water, and present human health impacts.

Eat Local

Transportation accounts for approximately 14% of the total energy used in the US food system. There is significant room for improvement in how people acquire their food, and get it home. Eating local, and consolidating shopping trips can reduce this impact.

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3. USDA ERS (2017) "Food Dollar Series.”
5. USDA, ERS (2019) "Food Dollar Series.”
7. USDA, ERS (2013) "Food Product Dating”
12. USDA, ERS (2016) “Food Product Dating”
15. USDA (2013) "Intragenerational Water Use.”
19. USDA, ERS (2012) Adoption of Genetically Engineered Crops in the U.S.
24. Data Set: Nutrients Availability.
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