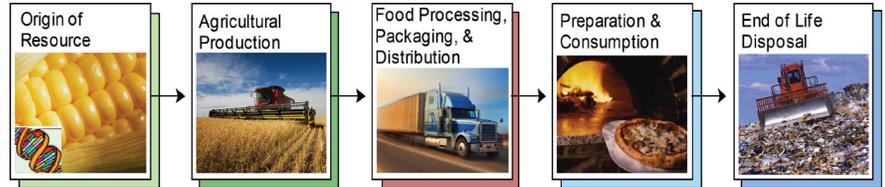


U.S. Food System

Americans enjoy a diverse abundance of low-cost food, spending a mere 10% of disposable income on food.¹ 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.

The Food System Life Cycle



Patterns of Use

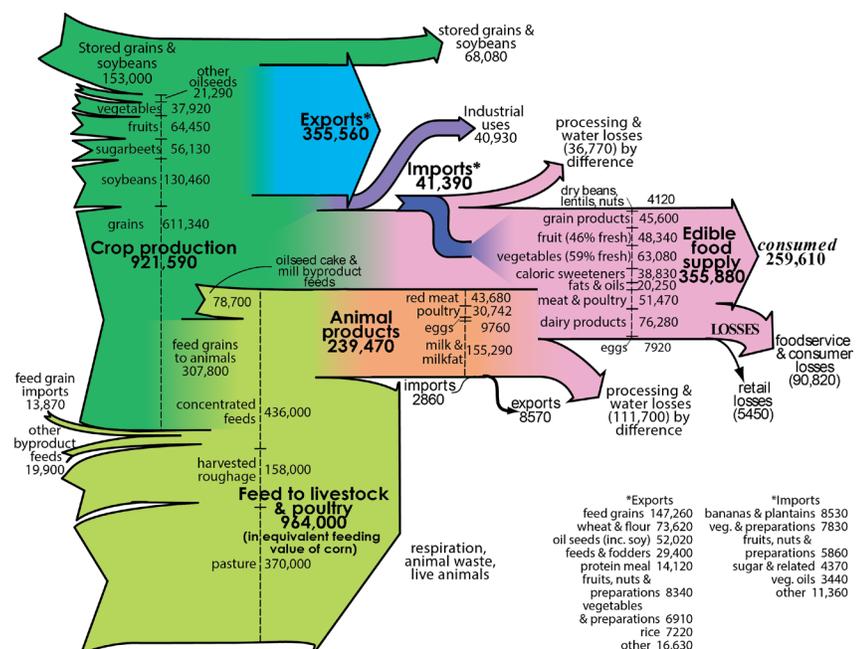
Agricultural Production

- Farmers account for 1% of the population, and the average age of farmers is leveling off in the mid-50s after a rapid increase.^{2,3}
- Large-scale family farms account for only 2% of all farms, but 35% of production. Small-scale family farms account for only 26% of production, but represent 90% of U.S. farms.⁴
- Just 16¢ of every dollar spent on food in 2015 went back to the farm; in 1975, it was 40¢.^{5,6}
- In 2012, farmers were reliant on income sources outside the farm to make up 80% of their household income, on average.²
- In 2011-2012, 48% of the hired agricultural labor force lacked authorization to work in the United States.⁷
- From 1997 to 2007, total cropland decreased from 455 million acres to 408 million acres.⁸
- Many parts of the U.S., including agricultural regions, are experiencing increasing groundwater depletion (withdrawal exceeds recharge rate).⁹ In 2013, 88.5 million acre-feet of water were used for irrigation—more than 520,000 gallons per acre; groundwater sources supplied more than half this amount.¹⁰
- Nutrient runoff from the upper agricultural regions of the Mississippi River creates a hypoxic “dead zone” in the Gulf of Mexico that averaged over 5,742 sq mi in size between 2007 to 2013.^{11,12}
- Although pesticide use declined 1.4% annually from 1996 to 2007, herbicide use increased significantly during the same period.¹³ In 2008, the U.S. agriculture sector used 516 million pounds of pesticides.¹⁴
- Decreased pesticide use is due in part to widespread deployment of genetically engineered crops.¹⁴ Less than 20% of corn and soy plants were genetically engineered in 1996; by 2016, 92% of corn and 94% of soybeans were genetically modified.^{15,16}
- In 2012, 1.67 billion tons of topsoil were lost to erosion, equal to about 190,000 tons each hour.¹⁷
- Agriculture was responsible for 7.9% of total U.S. greenhouse gas emissions in 2015. Livestock and soil management are major contributors.¹⁸

Consumption Patterns

- In 2010, the U.S. food supply provided 4,000 calories per person per day.²⁰ Accounting for waste, the average American consumed 2,476 calories per day in 2010, an increase of 22% from 1970.²¹
- In 2014, 185 lbs of meat per person were available for consumption, up 7 lbs from 1964.²² 32% of grains grown are used to feed animals, down from 50%+ in past years.²³
- The average American consumes about 23 teaspoons of added sugars and sweeteners per day; the American Heart Association recommends between 6 and 9 teaspoons daily for an average adult.^{24,25}
- More than 70% of U.S. adults are overweight or obese (body mass index 25+), and 17% of children age 2-19 are obese.^{26,27}
- Diet contributes to heart disease, certain cancers, and stroke—leading causes of U.S. deaths.^{26,28}
- An estimated 21% of the edible food available is wasted at the consumer level, 50% more than in 1970.^{29,30} This waste accounts for roughly 15% of the municipal solid waste stream and represents a loss of \$455 per person each year.^{30,31} One estimate suggests that 2% of total annual energy use in the U.S. is used to produce food that is later wasted.³²

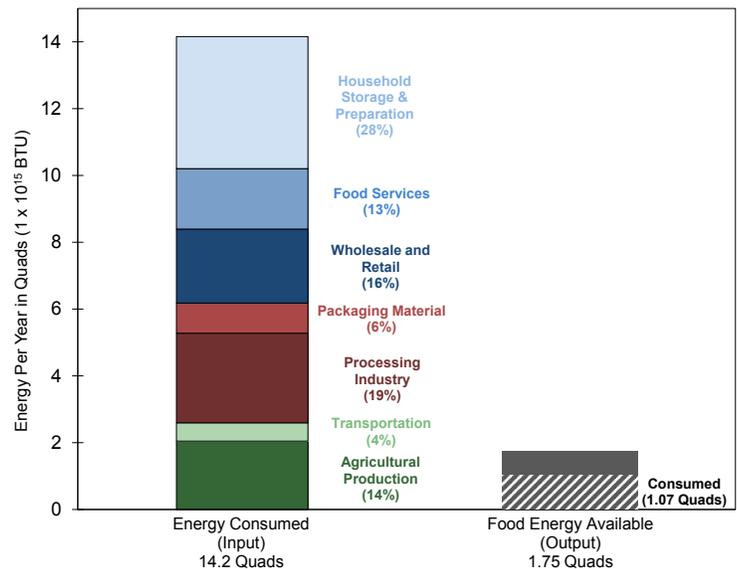
Material Flow in the U.S. Food System¹⁹
(1995, flows in million pounds)



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.³³ Modern agriculture and the food system as a whole have developed a strong dependence on fossil energy; 13 units of (primarily) fossil energy are consumed for every unit of food energy produced.^{19,20,21,33,34}

- On-farm production amounts to approximately 20% of the total system energy. 40% of agriculture production energy goes into making chemical fertilizers and pesticides.¹⁹
- Food processing, wholesale and retail services, and household energy consumption made up 60% of food-related energy flows in 2002.³³
- Reliance on fossil fuel inputs makes the food system increasingly vulnerable to oil price fluctuations.¹⁹
- Consolidation of farms, food processing operations, and distribution warehouses often increases distance between food sources and consumers.¹⁹
- Consolidation in the food system is also concentrating management decisions into fewer hands. For example:
 - Four firms control 85% of the beef packing market; 82% of soybean processing is controlled by 4 firms.^{35,36}
 - The top four food retailers sold 36% of America's food in 2013, compared to only 17% in 1993.³⁷



Solutions and Sustainable Alternatives

Eat Local

Fresh produce eaten in the Midwest travels an average of more than 1,500 miles. A study by the Leopold Center showed that increasing Iowa's consumption of regionally grown fresh produce by only 10% would save more than 300,000 gallons of transportation fuel per year.³⁸ Community Supported Agriculture (CSAs) and Farmers Markets are both great ways to support a local food system.

Eat Less Meat

A meat-based diet (28% calories from animal products) uses twice as much energy to produce as a vegetarian diet.¹⁹ Meat production as it is widely practiced today also has significant environmental impacts on land use, water use and water pollution, and air emissions.³⁹

Eat Organic

Organic farms don't use chemicals that require large amounts of energy to produce, pollute the soil and water, and present human health impacts. Sales of organic food in 2015 were 11% higher than in 2014; organic food now accounts for nearly 5% of all food sold in the U.S.⁴⁰

Use Less Refrigeration

Home refrigeration accounts for 13% of all energy consumed by our food system.¹⁹ 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.¹⁹

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.⁴¹ Many foods that are still safe are thrown out due to confusion about "sell-by" and "use-by" dates.⁴² For further information on food product dating, see the USDA's Food Safety and Inspection Service.

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