

Oil and Food: A Rising Security Challenge

By Danielle Murray | Friday, June 10, 2005

Little though you may not realize it, threats to our oil supply are also threats to our food supply. As food undergoes more processing and travels farther, the food system consumes ever more energy each year. Using the example of the United States, Danielle Murray explains the modern food system's dependence on cheap oil — and the escalating costs of a globalized food industry.

The U.S. food system uses over 10 quadrillion Btu (10,551 quadrillion Joules) of energy each year, as much as France's total annual energy consumption. Growing food accounts for only one fifth of this.

Fossil fuel reliance may prove to be the Achilles' heel of the modern food system.

While 21% of overall food system energy is used in agricultural production, another 14% goes to food transport, 16% to processing, 7% to packaging, 4% to food retailing, 7% to restaurants and caterers and 32% to home refrigeration and preparation.

Food today travels farther than ever, with fruits and vegetables in western industrial countries often logging 2,500–4,000 kilometers from farm to store.

Increasingly open world markets combined with low fuel prices allow the import of fresh produce year-round, regardless of season or location. But as food travels farther, energy use soars.

Energy-intensive transportation

Trucking, which accounts for the majority of food transport, is nearly 10 times more energy-intensive than moving goods by rail or barge.

Refrigerated jumbo jets — 60 times more energy-intensive than sea transport — constitute a small but growing sector of food transport, helping supply northern hemisphere markets with fresh produce from places like Chile, South Africa and New Zealand.

High price of processing

Processed foods now make up three-fourths of total world food sales. One pound (0.45 kilograms) of frozen fruits or vegetables requires 825 kilocalories of energy for processing and 559 kilocalories for packaging, plus energy for refrigeration during transport, at the store and in homes.

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Processing a one-pound can of fruits or vegetables takes an average 261 kilocalories, and packaging adds 1,006 kilocalories, thanks to the high-energy intensity of mining and manufacturing steel.

Processing breakfast cereals requires 7,125 kilocalories per pound—easily five times as much energy as is contained in the cereal itself.

Most fresh produce and minimally processed grains, legumes, and sugars require very little packaging, particularly if bought in bulk.

Processed foods, on the other hand, are often individually wrapped, bagged and boxed, or similarly over packaged. This flashy packaging requires large amounts of energy and raw materials to produce; yet almost all of it ends up in our landfills.

Large retail drives consumption

Food retail operations, such as supermarkets and restaurants, require massive amounts of energy for refrigeration and food preparation.

The replacement of neighborhood shops by "superstores" means consumers must drive farther to buy their food and rely more heavily on refrigeration to store food between shopping trips. Instead, food is shipped from distant large-scale farms and distributors — adding again to transport, packaging and refrigeration energy needs.

Energy-saving tactics

Rather than propping up fossil fuel-intensive, long-distance food systems through oil, irrigation and transport subsidies, governments

could promote sustainable agriculture, locally grown foods, and energy-efficient transportation.

Open world markets and low fuel prices allow the import of fresh produce regardless of season or location. But as food travels farther, energy use soars.

Incentives to use environmentally friendly farming methods such as conservation tillage, organic fertilizer application, and integrated pest management could reduce farm energy use significantly.

Rebate programs for energy-efficient appliances and machinery for homes, retail establishments, processors, and farms would cut energy use throughout the food system.

Legislation to minimize unnecessary packaging and promote recycling would decrease energy use and waste going to landfills.