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Saving Energy on the Stove

"Energy, Food, and the Consumer" by Mary Rawitscher and Jean Mayer, in *Technology Review* (Aug.-Sept. 1979), Massachusetts Institute of Technology, Cambridge, Mass. 02139.

Three to 5 percent of total U.S. energy output (e.g., equivalent to the energy produced by the nation's hydroelectric plants) is consumed preparing food at home. Much of that energy could be saved if Americans changed their cooking and eating habits, write nutritionists Rawitscher and Mayer.

Certain culinary techniques waste more energy than others—an hour's baking time in a conventional oven, the authors say, uses eight times more energy than simmering for an hour on top of the stove. If every American reduced his use of electric ovens by one hour of baking at 350 degrees only once a month, the energy conserved would equal 7.6 million barrels of oil per year (current daily U.S. energy consumption equals about 36 million barrels of oil).

Consumers can also make energy-conscious decisions at the market. Not surprisingly, frozen foods, which must be stored in a freezer, waste electrical energy. Packaging, too, plays a role in the energy cost of food; the authors claim that if consumers used one less disposable aluminum tray (for TV dinners and frozen pies) each month, the nation would annually conserve the equivalent of 2.8 million barrels of oil.

One food that consumes little energy in packaging and refrigeration is fresh meat. But beef is one of the most energy-intensive foods, say the authors, due to the fuel and petroleum-based fertilizers needed to produce feed grains for cattle. Substituting a pound of fish once a month for a pound of beef would save 100 million barrels of oil annually. Consumers, the authors conclude, should replace red meat on their menus with vegetable protein or fish (unfrozen) to save energy; their health would benefit as well.

Growing Oil

"Petroleum Plantations for Fuel and Materials" by Melvin Calvin, in *BioScience* (Sept. 1979), 1401 Wilson Blvd., Arlington, Va. 22209.

The United States can reduce its dependence on imported oil by cultivating plants that produce hydrocarbons, says Calvin, director of the Laboratory of Chemical Biodynamics at the University of California, Berkeley.

The genus *Euphorbia*, a relative of the *Hevea* rubber tree, grows wild in semi-arid regions throughout the world, including Africa, Japan, Israel, and the United States; it has been successfully cultivated in California, Texas, Arizona, and Florida. *Euphorbia* produces an oil that can be used to manufacture plastics and synthetic fibers. It can also be processed into fuel.

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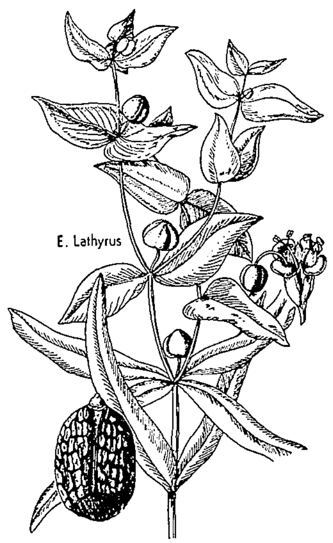
Experimental plantings of various species of *Euphorbia* have produced, on average, 10 barrels of oil a year per acre. (Genetic manipulation and selection of the most productive plants, Calvin predicts, could raise the annual per acre yield to as much as 50 barrels of oil.) The scheme demands "hundreds of millions of acres" to be effective, and, Calvin admits, cost is a problem. Oil flowing from a 1,000-barrels-a-day growing-and-processing facility would cost $60 per barrel. But if the processing plant's daily capacity were expanded to 100,000 barrels (the United States currently consumes about 19 million), and the trees' yield were boosted to even 20 to 30 barrels of oil per acre, the price of *Euphorbia* oil would drop to $15 per barrel, or about $10 below the average 1979 petroleum price on the world market.



The Euphorbia *tree contains an oil that can be processed into petrochemicals.*

Managing the Forests

"Implications of Economic Forest Management" by William F. Hyde, in *Policy Analysis* (Summer 1979), University of California Press, Berkeley, Calif. 94720.

Inefficient forest management has spurred government predictions of a "timber famine" by the year 2000 in the Pacific Northwest, source of one-fourth of the annual U.S. timber harvest.

No such famine need occur, argues Hyde, a research associate at Resources for the Future. Annual harvests in the Northwest range from 24 million to 26 million "cunits" (one cunit equals 100 cubic feet). According to Hyde, more sophisticated management would yield a potential harvest of 42 million cunits.

Efficient timber production depends on several variables, including the quality of soil, intensity of cultivation (e.g., using fertilizers and genetic breeding to boost tree growth), and access to the land (rough terrain and distance from the saw mill increase costs).

Current forest management techniques ignore such variables, says Hyde. Attuned to specific biological and geographical factors, he suggests, foresters could achieve a far larger yield from the most productive acreage. Marginal land now being used for timber could then be allotted to recreation, tripling wilderness and park areas. (Hyde esti-