
America's Food

What You Don't Know About What You Eat

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The MIT Press
Cambridge, Massachusetts
London, England

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This book was set in Sabon on 3B2 by Asco Typesetters, Hong Kong.
Printed on recycled paper and bound in the United States of America.

Library of Congress Cataloging-in-Publication Data

Blatt, Harvey.

America's food : what you don't know about what you eat / Harvey Blatt.

p. cm.

Includes bibliographical references and index.

ISBN: 978-0-262-02652-9 (hardcover : alk. paper)

1. Food industry and trade—Health aspects—United States. 2. Agriculture—Environmental aspects—United States. I. Title. II. Title: What you don't know about what you eat.

HD9005.B628 2008

363.19'20973—dc22

2008013826

10 9 8 7 6 5 4 3 2 1

Old MacDonald Has No Farm: He Dies, She Dies, Sold

There are two spiritual dangers in not owning a farm. One is the danger of supposing that breakfast comes from the grocery, and the other that heat comes from the furnace.

—Aldo Leopold, ecologist

Farmers are the only indispensable people on the face of the earth.

—Li Zhaoxing, Chinese Ambassador to the United States, 1998

What do Americans think of when the words *farm family* are heard? For most of us, raised in cities and on films starring John Wayne, a vision of a rutted dirt road, a farmhouse in need of paint and with a sloping front porch, hard-working pa, pious ma, the young ‘uns, a tired old plow horse, and the faithful family dog come to mind. Depending on the film, cattle barons, rustlers, foreclosures, and sympathetic but unyielding bankers may be in the picture. Does this farm family still exist? Did it ever? Well, maybe it did in 1807 or even 1907 but no longer.

Agrarianism and Nostalgia: Those Were the Good Old Days

To own a bit of ground, to scratch it with a hoe, to plant seeds, and watch the renewal of life—this is the commonest delight of the race, the most satisfactory thing a man can do.

—Charles Dudley Warner, *My Summer in a Garden*, 1870

A prevailing philosophy in colonial America was agrarianism, which sprang from the writings of Thomas Jefferson. He believed that country people were hard-working, self-sufficient, morally virtuous, and superior to city dwellers, a point of view no longer dominant in American culture but not extinct either. It survives in the near-worshipful attitude that many city dwellers and suburbanites still have toward the family farm as a romantic enterprise. Hollywood has had a large part in encouraging this notion in many cowboy movies over many decades. The image of the farmer as the salt of the earth, independent son of the soil, and child of nature is a sort of caricature covering over the image of the farmer as a rustic simpleton,

uneducated hick, or uncouth redneck. Both images serve to obliterate any concept of farming as an ancient, useful, honorable vocation, requiring intelligence, skill, great patience, and endurance, to say nothing of money. The colonial farmer needed little money to begin farming, only enough to buy a crude plow, a few hand tools, and some seed. A farmer wealthy enough to buy a draft animal might be the envy of the other settlers in the area. But times have changed. Expensive implements are now required for successful farming; modern tractors to cultivate the soil can cost \$200,000, and a planter \$70,000. Combines, machines that cut, thresh (separate grain from husk), and clean grain, cost \$250,000, as much as or more than a new home.

Successful crop farmers must be expert at selecting the varieties of plants that are adapted to their soils and climate. They must be skilled in preparing soil and in planting, growing, protecting, harvesting, and storing crops. They must be able to control weeds, insects, and diseases. In addition to these farming skills, today's farmer must know governmental farm policies, marketing strategies, and environmental laws and be a mechanic, electrician, and accountant, among many other roles. Few other occupations require such a diverse assortment of abilities. This is reflected in educational attainment: Since the early 1980s, farmers and farm managers have more formal education than the average American.¹

An additional variable, and one that is uncontrollable and unpredictable by the American farmer, is the federal government's foreign policy. If the government wants to punish a foreign nation, a convenient export item to restrict is food, a basic necessity that a hungry country cannot do without. Farmers rely on exports to help maintain food prices and therefore bear the brunt of this restriction. Agricultural exports were relatively unimportant to American farmers until 1955, when they began to increase rapidly, and today about 22 percent of farm production is exported.² Indexed for inflation, the value of farm exports increased by a factor of 8 between 1955 and 2001 (figure 1.1).

In 1776, 90 percent of the new Americans were farmers. Farms, like everything else, were located along the eastern seaboard. Of course, there were fewer in frigid Maine and New Hampshire than in the warmer southeastern states, but small farms were everywhere. The food everyone ate was grown and consumed locally. Today's domestically grown food travels thousands of miles and changes hands up to six times before reaching the table. In Iowa, the typical carrot has traveled 1,600 miles from California, a potato 1,200 miles from Idaho, and a chuck roast 600 miles from Colorado. Three-quarters of the apples sold in New York City come from the West Coast or overseas, even though the state produces far more apples than city residents consume.³ In 1776 there were no railroads or eighteen-wheelers, and long-distance transport by horse or mule was slow, difficult, and hazardous on rutted

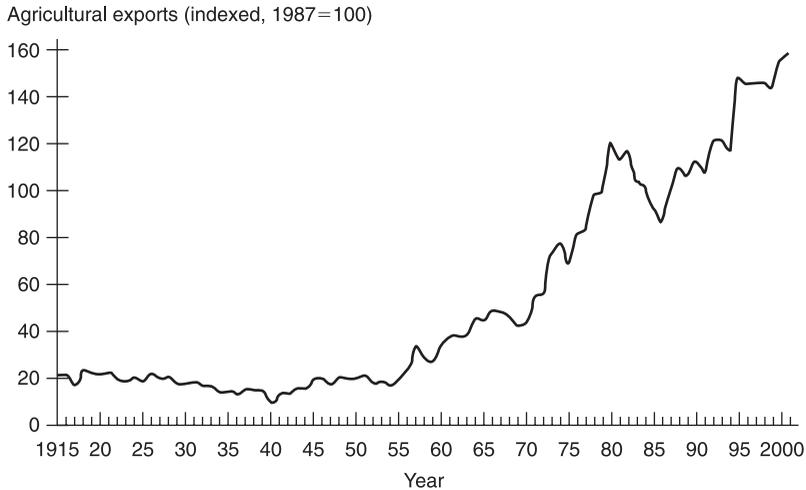


Figure 1.1

Growth of U.S. agricultural exports since 1915, indexed for inflation. *Source:* U.S. Department of Agriculture.

roads, ancient Indian paths, or animal trails. And the only food preservative available was salt. Calcium propionate, disodium EDTA, and BHA had yet to be invented. Flavor enhancers such as monosodium glutamate were unnecessary. Except in the northeastern United States during the winter months, food was fresh, and chances are that it was grown and harvested by a nearby family, probably the morning or the day before it was consumed.

As America expanded westward beyond the Appalachians during the 1800s, the view was unobstructed as far as the eye could see (no pollutant haze or smog). The ground was flat, the climate was mild for most of the year, and the abundant flowing Ohio, Mississippi, and Missouri rivers had sizable tributaries extending for a thousand miles west to the Rocky Mountains. The flatland covered almost half of the future forty-eight states, described by novelist Willa Cather as “nothing but land, not a country at all, but the material out of which countries are made.” There was more high-quality land available for agriculture in the United States than in any other country—more than 800 million acres.⁴ When this land was combined with the independent spirit, background knowledge, and the work ethic of the pioneers, agricultural abundance was ensured. Many of the potential farmers in this new nation had either been farmers in Europe or were the children of these immigrants and had learned crop farming working with their fathers. They had a fund of background knowledge and knew what they were doing. They were not totally divorced

from agriculture like most of today's Americans, who live in cities or nearby suburbs. Large factories were unknown, and most people were farmers. Operating a farm was a productive and profitable enterprise.

Machines Invade the Farm

The technology of mass production is inherently violent, ecologically damaging, self-defeating in terms of non-renewable resources, and stultifying for the human person.

—E. F. Schumacher, *Small Is Beautiful*, 1973

Most crop farmers in colonial times did their work with hand tools. Only a few had a draft animal, normally an ox or a horse, to pull a crude plow. In 1830 it took 250 to 300 hours of back-breaking labor to produce 100 bushels (the production from 5 acres) of wheat.⁵ During the early 1800s, hundreds of inventors, many of them farmers weary of the grinding toil of subsistence farming, built, experimented, and tinkered with machines they hoped would make their work easier. The wildly successful ones like Cyrus McCormick and John Deere founded manufacturing concerns that are still in business (McCormick's firm is now International Harvester). The reliability of their products is forcefully expressed by a sign posted in a John Deere sales office: "The only machine we don't stand behind is our manure spreader." A modern harvester, which costs about \$125,000, cuts a swath 16 feet wide with each pass, measuring the amount of grain and its moisture content as it moves, and it can harvest 900 bushels of corn per hour. In 1998 Japanese researchers developed a tractor that can till, seed, and fertilize fields by itself. It uses global positioning satellites to make its way around the field and can find its way with a margin of error of 2 inches.⁶

By the late 1800s, sophisticated farm machines became available that embodied the principles of many of today's modern implements, and fewer farmers were needed: only about half of the population were farmers. The amount of labor needed to produce 100 bushels of wheat in 1890 was 40 to 50 hours, less than one-fifth of the time needed sixty years earlier.⁷ Nearly all of the new machines were animal powered, as internal combustion engines were rare and the large and heavy steam engines were too expensive for most farmers. Even after the introduction of smaller gasoline-powered tractors during the first decade of the 1900s, the horse, donkey, and mule population in the United States continued to grow, reaching an all-time high of 26.4 million animals in 1918.⁸ These beasts of burden were gradually retired, and by the mid-1900s had all but disappeared as essentials in crop farming. Farmers now use 5 million tractors in place of the horses and mules of yesteryear.⁹ Current agricultural technology enables one person to be fed from the food grown on about 21,000 square feet, a plot 145 feet square.¹⁰ Two hundred years ago the area needed was ten times greater.

With farm mechanization, the time required to produce 100 bushels of wheat decreased from about a week in 1890 to 5 hours in 1965 to about 2 hours today; the time required to cultivate an acre of corn decreased from 35 to 40 hours in 1890 to 12 hours in 1945 to less than 3 hours today.¹¹ Farms were able to increase in size, and the more successful farmers gobbled their neighbors' land. The percentage of Americans who farmed dropped precipitously from about 40 percent in 1900 to 12 percent in 1950. Only 1.9 percent of America's employed labor force works in agriculture today. Like the white rhino and the mountain gorilla, farmers have become an endangered species. Contributing to the endangerment is increased mechanization. According to the U.S. Bureau of Labor Statistics, farmers are more than twice as likely to die on the job as police officers and nearly four times as likely to be killed at work than firefighters.

The typical American farm is sold, probably to become part of a larger farm, at least every generation. Today 2 percent of American farmers own 36 percent of the land, 10 percent own 62 percent of the land, and the bottom 70 percent of farmers own just 16 percent.¹² It is clear that agricultural land is being concentrated in fewer and fewer hands. The number of farms has decreased sharply from a high of 6.8 million in 1935 to only 2.1 million in 2005,¹³ although the total number of acres farmed (at a maximum in 1950) is about the same today as it was in 1925 and has been decreasing for decades.¹⁴ Average farm size in America has skyrocketed from about 146 acres in 1900 to 449 acres in 2007 (figure 1.2). (As a point of reference, 640 acres equals 1 square mile.)

Because of the large size and favorable topography of the United States, our capitalist economic system, favorable climate, mechanization, intensive fertilization, and genetic manipulations of crops, American farmers are the backbone of the world's agricultural productivity. Total U.S. agricultural output more than doubled between 1948 and 2004, increasing at an average annual rate of 1.74 percent. Gains in productivity account for all of the growth in output.¹⁵ The United States is the world's major food exporter, as dominant in the world's agriculture as the Organization of Petroleum Exporting Countries is in oil production. Two hundred years ago, typical American farmers would feed their family and perhaps a neighboring family when times were hard. In 1960, the farmer's largesse would feed 26 people; today one farmer feeds about 212 people.¹⁶ Although 98 percent of all farms are still family farms, they are not the mom-and-pop operations of yesteryear, and they may be organized as proprietorships, partnerships, or family corporations.¹⁷ In terms of productivity or profitability, very large operations with their many economies of scale have replaced the 40-acres-and-a-mule concept of cowboy movies. One percent of American farmers account for over 50 percent of farm income; 9 percent account for 73 percent.¹⁸ We are in the age of industrial agriculture with its destructive and dangerous reliance on a few high-yield crops with limited species variation,

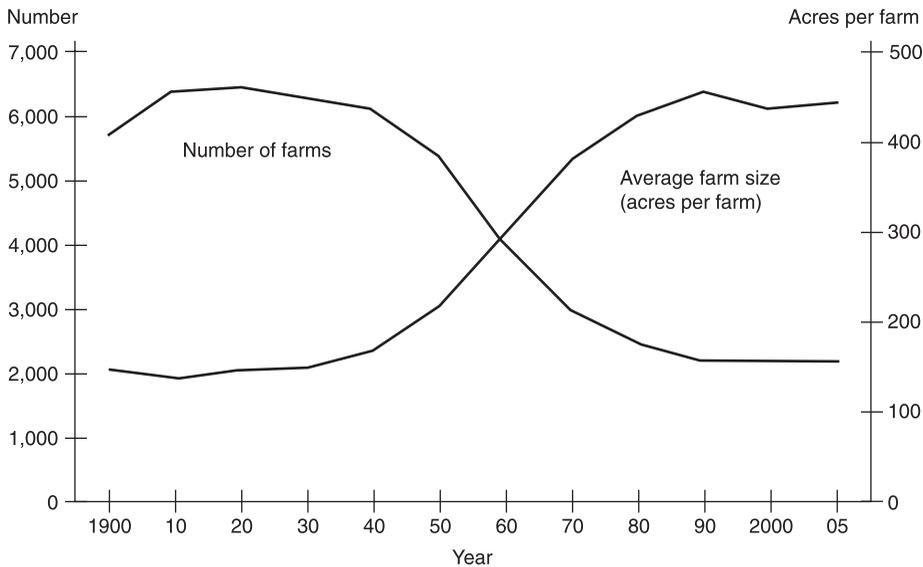


Figure 1.2

Change in number and average size of farms in the United States, 1900–2005. *Source:* U.S. Department of Agriculture.

enormous amounts of artificial fertilizers, and intensive use of ever more lethal pesticides. Traditionally the farmer relied on natural predators to control pests, animal manures for fertilizer, crop rotation (planting different crops in alternate years) to discourage pests and restore soil nutrients, and fallowing (allowing land to remain unplanted every so often to rejuvenate the soil). The degree of specialization in farming is revealed by the fact that in 1900, the average farm produced five commodities;¹⁹ today the average is only one, the mathematical lower limit.

A small number of farm operations produce the majority of agricultural products consumed in America today. This has occurred because since the 1950s, American agricultural policies have been grounded in the belief that farms should produce as much food as possible for the least cost. These policies have led to a landscape of fewer but bigger farms that specialize in a decreasing number of commodities destined for fewer processors and packers. Eighteen percent of all farms, those larger than 500 acres, produce 75 percent of America's harvest.²⁰ There are relatively few farmers and few farms, and the most successful ones are highly mechanized and enormous. The possible future of farming was all too vividly described by a farmer in Minnesota: "The way things are going now, I foresee the day when there's one farmer on the east side of the Mississippi and one on the west side. They'll be plowing and they'll meet at the river. There'll be a discussion, and shortly thereafter,

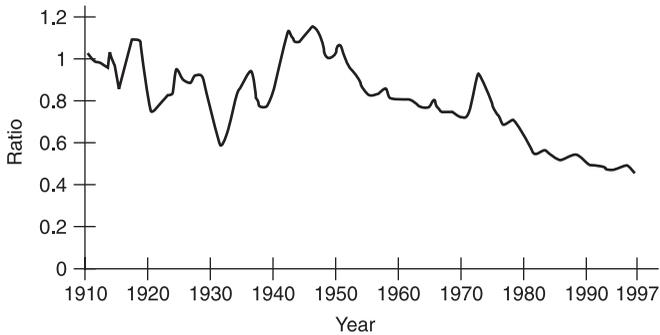


Figure 1.3

Index of average farm income: Ratio of prices received by farmers to prices paid, 1910–1997.
Source: U.S. Department of Agriculture, National Agricultural Statistical Service.

there'll be one hell of a tiling project [to drain the river] and then there'll be only one farmer.”²¹

The same observation was made about 3,000 years ago by the Israelite prophet Isaiah (5:8).

Woe to those who add house to house
 and join field to field
 until everywhere belongs to them
 and they are the sole inhabitants of the land.

Where Are the Profits?

How pleasant it is to have money, heigh ho!
 How pleasant it is to have money.

—Arthur Hugh Clough, *Dipsychus*, 1850

Despite mechanization and enormous farm sizes, farm incomes have plummeted more or less continuously since 1950 (figure 1.3). Real commodity prices have fallen by about two-thirds over the past fifty years. The share of the food dollar received by American farmers is only 25 cents and has been decreasing for the past thirty years.²² Adjusted for inflation, consumer food prices increased 3 percent from 1984 to 1998 while prices paid to farmers dropped 36 percent.²³ The vast majority of the money now goes to food processors, food marketers, and agricultural input (i.e., chemicals, seed, and fuel for agricultural machinery) suppliers.

As the prices paid to farmers decreased, the cost of running a farm increased. Between 2001 and 2005 the increase was 5.7 percent. In many areas of the United States, farm families depend on food donations from social service agencies, church

pantries, and soup kitchens.²⁴ The loss of income has been particularly disastrous for small farmers. Eighty percent of farmers on small acreages have farm incomes below the poverty line,²⁵ and 59 percent of farms have less than \$10,000 in sales annually. Most of the families on small farms survive only by supplementing their farm income with off-farm work.²⁶ In 2001 three out of every four farm households earned the majority of their income from off-farm sources. In 2004 nonfarm jobs accounted for 91 percent of the income of farm households.²⁷ Of the 956,000 farm operators who indicated that their primary job was off-farm work, 725,000 (76 percent) said that off-farm work was now their career choice.²⁸ They no longer find farming a rewarding occupation.

Where Are the Children?

The larger our great cities grow, the more irresistible becomes the attraction which they exert on the children of the country, who are fascinated by them, as the birds are fascinated by the lighthouse or the moths by the candle.

—Havelock Ellis, *The Task of Social Hygiene*, 1913

Young people today rarely consider farming as an occupation. The result is that farms are becoming homes for the chronologically challenged. The average age of full-time farmers in 2002 was 55.3; the average age of the nonfarm labor force was only 40.²⁹ In the ninety-nine U.S. counties with the highest percentage of residents older than 85, all but two are in the Great Plains agricultural belt.³⁰ Cemeteries in rural farming communities have so many fresh mounds that it looks as if badgers have dug there all winter. One North Dakota farmer in a town that recorded more deaths than births in 2000 joked that the few remaining residents may have to start importing pallbearers.

The children of farmers are leaving the family business and moving to the cities and suburbs. Only 17 percent of the U.S. population lived in rural areas in 2000.³¹ In nearly 70 percent of the counties on the agricultural Great Plains, there are fewer people now than there were in 1950, and population decrease has accelerated since 2000.³² Upon retirement or death, many veteran farmers pass the farm on to children who live elsewhere and have no interest in farming. Although membership in the National FFA Organization, known until 1988 as the Future Farmers of America, has swelled by 100,000 since 1990, very few of these new members plan to be farmers. Their career plans are to be food industry scientists, seed bioengineers, turf grass managers, food economists, nutritionists, florists, landscapers, and renewable fuels engineers.³³ Many of their farmer parents will sell the farmland to commercial developers, who are likely to use the extensive acres of flat land for more suburban housing.

In an era of unparalleled affluence and leisure, the American farmer on a small to moderately sized farm is harder pressed and harder worked than ever before. The farm's margin of profit is small to nonexistent, working hours are long, expenses for equipment and maintenance are increasing rapidly, the farm's labor force is being lost to higher-paying industrial jobs, and the farmer is being forced to spray noxious chemicals on the crops to compete with the megasized industrial farms. The average farmer is now nearing retirement, and the family's children have moved away. A farmer's work has low status in the societal pecking order and is considered marginal to the nation's economy, although farming accounts for about one-tenth of America's gross domestic product. The owner's place is being taken by absentee owners, large corporations, and machines.

For a long time, the news from everywhere in rural America has been almost unrelievedly bad: bankruptcy, foreclosure, depression, suicide, the departure of the young, the loneliness of the old. Between 1980 and 1997, the difference in suicide rates between men in the most rural and most urban counties grew from 21 percent to 54 percent. An astonishing 330 farm operators leave their land every week.³⁴ With the loss of hereditary farmers who felt an integral part of the land they served has come industrial farming and accelerated soil loss, soil degradation, chemical pollution, loss of genetic diversity, depletion of aquifers, and stream degradation.

Farm Subsidies: The Rich Get Richer

To those who have, more will be given;
from those who have not, what little they have will be taken away.

—Mark 4:25

We have all heard of federal government subsidies, cash given to certain groups to help them survive bad economic times. And there is no doubt that most American farmers are in bad economic times and have been for decades. In some ways, subsidies are analogous to the minimum wage guaranteed to industrial and service workers. In 1940 direct payments to farmers were \$3 billion; they have risen cyclically since then, reaching an all-time high of \$24 billion in 2005 before declining to \$18 billion in 2006 (figure 1.4). When other federal supports such as subsidized water for irrigation and subsidized crop insurance are included, total support for farmers is roughly three times as much as for direct cash subsidies alone.³⁵ As a percentage of farm profits, government subsidies have ranged from 2 percent in 1974 to 47 percent in 2000. In 2005 they accounted for about 30 percent.³⁶ The government plans to significantly reduce subsidy payments in the coming years.

Lest we feel farmers are particularly privileged in benefiting from government assistance, we should note that all Americans get federal largesse, although they do not call it a subsidy. Businesses get rapid depreciation allowances on new

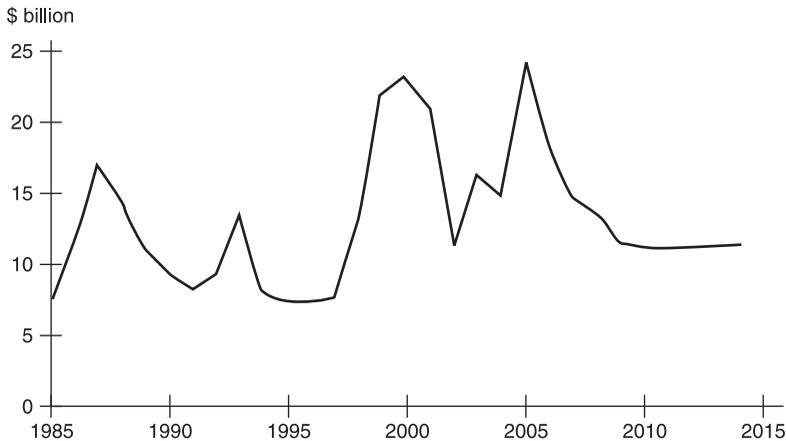


Figure 1.4

Size of direct payments to farmers by the federal government. *Source:* USDA Agricultural Baseline Projections to 2014, February 2005. Economic Research Service, USDA.

equipment; oil companies get depletion allowances as reserves decline; home owners get mortgage interest deductions from taxable income; parents get tax deductions for children; and poor families get federal and state assistance, commonly called welfare. But a subsidy by any other name is still a subsidy.

Agricultural subsidies were created during the Great Depression in the 1930s to promote a rural middle class when much of the population still worked in the farm sector. These subsidies are anachronistic now that agribusiness in developed countries employs only a tiny percentage of the population. But for the past seventy years, the government has paid farmers to grow food. The original system guaranteed price supports: grain would be sold for a minimum price no matter who grew it. But in the 1960s, Congress slowly switched to supporting farmers' incomes, not crop prices. For the purpose of determining who will receive subsidies, a farmer was defined as a person, partnership, or corporation that owns farmland, not as a person who actually farms.³⁷ Under this definition, farmers who have been receiving large amounts of federal money (which comes from taxes) include former professional basketball star Scottie Pippen, pornographer Larry Flynt, stock brokerage mogul Charles Schwab, more than a dozen senators and congressional representatives (some on agricultural committees), and billionaires David Rockefeller and Ted Turner. Other beneficiaries are well-known Fortune 500 farmers such as International Paper, Chevron, DuPont, and John Hancock Mutual Life Insurance.³⁸ Other beneficiaries include more than 1,200 universities, government farms (including state prisons), and real estate developers.³⁹ Between 1999 and 2005, the U.S. De-

Table 1.1

The 16 most costly direct agricultural crop subsidies in 2004 (* = program crops). There also are subsidies for the conservation reserve program (\$1.8 billion), disaster payments (\$548 million), environmental quality incentive program (\$224 million), and the wetlands reserve program (\$14 million). (Environmental Working Group, 2005)

Subsidy program	Subsidy	Percent
Corn*	\$4,501,951,045	45.40
Cotton*	\$1,649,366,720	16.63
Wheat*	\$1,215,411,553	12.26
Soybean*	\$913,345,172	9.21
Rice*	\$636,205,504	6.42
Sorghum*	\$313,220,331	3.16
Peanut	\$213,046,953	2.15
Dairy Program	\$206,530,250	2.08
Barley*	\$166,949,308	1.68
Dry Pea	\$30,461,699	0.31
Livestock	\$27,041,523	0.27
Sunflower	\$13,324,195	0.13
Fish	\$11,248,791	0.11
Wool	\$6,716,264	0.07
Oat*	\$5,838,919	0.06
Canola	\$5,238,135	0.05
TOTAL	\$9,915,896,362	99.99

partment of Agriculture (USDA) paid \$1.1 billion to the estates or companies of deceased farmers.⁴⁰ These farmers, alive or dead, have received payments based on the amount of land they owned and the acres of crops they plant that are covered by subsidies, called “program crops.”

There are eight program crops. In 2002, corn, wheat, soybeans, rice, and cotton growers received 90 percent of the subsidies. Growers of the other favored crops, barley, sorghum, and oats, received 5 percent.⁴¹ Other subsidized crops include apples, peanuts, peas, sunflower, and canola (table 1.1). Growers of most of the 400 other domestic food crops, the 66 percent of farmers who produce products such as such as eggs, poultry, cattle, nuts, tomatoes, strawberries, cantaloupes, and most vegetables, do not qualify for farm subsidies. Recently, however, competition from nations with low labor costs has caused American vegetable growers to call for government assistance.⁴² The effect of designating certain crops as program crops is shown by the effect in Iowa. In 1945, Iowa’s farmers grew seventeen commercial

crops, including potatoes, cherries, peaches, plums, pears, strawberries, raspberries, and wheat. Now the commercial crops are down to four: corn, soybeans, hay, and wheat. Three of these four are subsidized program crops, and the fourth is hay, which farmers need to feed livestock. In 2005, 82 percent of harvested acreage in the United States was in these four crops.⁴³

In an attempt to reduce farm welfare payments to the very rich, the farm bill passed in 2002 disqualified farm owners whose annual income exceeds \$2.5 million or who do not actually make a living from farming from receiving federal subsidies. The change was largely a public relations ploy, as very few farmers were affected. In the 2005 federal budget, the annual ceiling on subsidy payments was lowered by 30 percent, from \$360,000 to \$250,000.

Although agricultural subsidies are typically touted as an attempt to provide a safety net for small farmers, a politically useful claim (“we need to save family farms” has a who-can-argue-with-that ring to it), the fact is that the rich benefit most from the subsidy program. According to the Environmental Working Group, between 2003 and 2005, the top 10 percent of American “farmers” received 66 percent of federal subsidy money, with an average payment of \$148,077 over the three years.⁴⁴ The bottom 80 percent of recipients received 16 percent, with an average payment of \$4,508 over the period. Two-thirds of America’s farmers do not qualify for any assistance at all. The program is of little help to small farmers and functions mainly as a corporate welfare program. Small farmers say that the annual agricultural subsidies help big agribusinesses by lowering the prices of corn, soybeans, and other grains. These firms then make their profits by selling goods overseas in a system geared toward exports. According to the USDA, subsidy payments induce farmers to grow 25 million acres more corn and soybeans than the country needs. At the low subsidized prices, farmers have to grow larger quantities to make any profit, a cycle that eventually undermines small family farmers. In addition, large farms use their massive government subsidies to buy out smaller farms and increase consolidation in the agriculture industry. This process feeds on itself to eliminate small farmers. Fewer and fewer monster corporations control agricultural production in the United States. John Ikerd of the University of Missouri observed, “Every farm bill since the 1930s has had as its stated objective the preservation of family farms. But the reality has been greater support of specialized agriculture as a means of increasing efficiency and reducing the cost of food to the consumer.”⁴⁵

The problem with the American subsidy system is that it emphasizes output. The subsidy system encourages high-output industrial farming that will yield lots of product in the short term instead of sustainable agriculture that has high long-term productivity with very low input. Because subsidies are distributed based around particular crops, they also promote monoculture (growing of a single crop rather than several complementary crops). The externalized costs of environmental degra-

dation also add to the hidden profit of industrial agribusiness. When corporations move in with conventional agriculture, they deplete the nutrients from the soil, trailing runoff pollution from fertilizers (see chapter 2). They do not have to pay for any of the damage they have done or the resources they have stolen; all of it converts into profit. Studies in Great Britain have revealed that a “conservative estimate” of the costs of cleaning up pollution, repairing habitats, and coping with sickness caused by conventional farming almost equals the industry’s income.⁴⁶

A large number of economists and groups interested in the welfare of the American farmer continually clamor for major revisions in federal farm policy or for the total elimination of farm subsidies. So far their voices have fallen on deaf congressional ears. There are at least two politically important reasons for congressional inaction. First, the subsidies (paid from tax dollars) allow America’s major exported farm products to be sold overseas at low prices, enabling them to flood the world market with inexpensive program food crops. In effect, American tax dollars are paying part of the cost of farm products bought by overseas customers. Robert Zoellick, U.S. trade representative, boasted in 2002 that 1 out of every 3 acres in the United States is planted for export.⁴⁷ The United States has a 55 percent share of world corn exports, sold at prices 20 to 30 percent below the cost of production. It exports 60 percent of the wheat crop, selling it at 40 to 46 percent below cost, and exports 30 percent of soybean production, selling it at 30 percent below cost; rice goes at 20 percent below cost.⁴⁸ As a result, through 2004, agriculture was one of the few sectors of the American economy where the United States consistently had a trade surplus.⁴⁹ But in 2005, reports the USDA, the nation had an agricultural trade deficit for the first time since 1959. After averaging over 40 percent in the 1990s, the surplus dropped to 25 percent in 2000 and 0 percent in 2005. Despite subsidies, U.S. agricultural trade surplus has fallen victim to dramatically increased agricultural output elsewhere, particularly in Brazil.⁵⁰

American businesses that thrive on subsidized global trade want to keep the subsidy system in place. But the subsidy system practiced by wealthy nations is a disaster for poor countries, whose economies depend heavily on agriculture. They are unable to sell their agricultural products. In many poor countries, it is cheaper to buy imported European or American farm products than to grow their own.

Second, the United States is not the major offender in the subsidy scandal. Its major overseas trading partners have even greater farm subsidies, and they refuse to anger their farmers and agribusiness constituents by dropping them. The European Union’s support for its producers in 2004 was 33 percent of the value of production; Japan’s totaled 56 percent. America’s was only 18 percent.⁵¹ Governments in the developed world hand out more than \$300 billion in agricultural subsidies each year to their “farmers.”⁵² Given the enormous political clout of farm and agribusiness lobbies, change will be slow in coming.

Cotton is one of the world's most heavily subsidized crops, and in January 2004, Brazil formally challenged the legality of this most egregious American subsidy in a case submitted to the World Trade Organization (WTO). American subsidies permit exporters to sell cotton at an astonishing 57 percent below the cost of production.⁵³ The cotton was exported at 37 cents a pound in 2002 but cost agricultural companies 86 cents to produce. In April 2004, the WTO ruled that the U.S. cotton subsidy was indeed violating global trade rules. The U.S. scrapped the cotton subsidy early in 2006.

North American Free Trade Agreement

Governments never learn. Only people learn.

—Milton Friedman, economist, 1980

The North American Free Trade Agreement (NAFTA), which took effect on January 1, 1994, calls for the gradual removal of tariffs and other trade barriers on most goods produced and sold in North America: the United States, Canada, and Mexico. It was designed to increase trade among the three nations involved, benefiting all.⁵⁴ Agriculture is one of the areas covered by the pact, and Canada and Mexico are the second and third largest export markets for U.S. agricultural products. In 2000, slightly more than one out of every four dollars earned through U.S. agricultural exports was earned in North America.⁵⁵ How has the American farmer fared under NAFTA?

When NAFTA was enacted, it was predicted that exports of agricultural products, such as grain, oilseeds, corn, and livestock, from the United States would increase. Decreases in exports were predicted for products such as melons, cucumbers, tomatoes, orange juice, and green peppers because of cheaper labor in Mexico and ideal growing conditions for these products south of the border. The United States would do better with grains and cattle, Mexico with produce. Some of these expectations were correct. U.S. soybean exports to Mexico have doubled since NAFTA was enacted, but many of the predicted benefits of NAFTA for the American farmer have not materialized. Farm incomes for small- and middle-income farmers have continued to decline and consumer prices have risen, while agribusinesses on both sides of the Rio Grande have prospered. The U.S. trade surplus in agricultural products with partners Canada and Mexico has declined significantly since NAFTA.⁵⁶ Imports of agricultural products from these neighbors have increased much faster than exports to them. Tomato farmers in Florida have been particularly hard hit, as imports from Mexico rose by 67 percent between 1994 and 2001 and drove two-thirds of the state's tomato growers out of business. Under NAFTA, the U.S. balance of agricultural trade with Canada went from a \$300 million surplus in

1994 to a \$1.7 billion deficit in 2002. The trade surplus with Mexico contracted by over \$1 billion under NAFTA, to \$1.7 billion in 2002. Canada and Mexico are America's largest trading partners, accounting for one-third of the total of \$71 billion worth of exports.⁵⁷

In addition to NAFTA's effects on the U.S. trade balance with Mexico, U.S. consumers have been placed at greater risk from contaminated produce. In 2004, the Food and Drug Administration inspected about 100,000 of the nearly 5 million shipments of food crossing our borders, 2 percent of the imports.⁵⁸ Imported Mexican strawberries caused a massive hepatitis outbreak among Michigan school-children in 1998, and in 2001 two people died from salmonella poisoning from cantaloupes imported from Mexico. Most recently imports of green onions from Mexico have been suspected in hepatitis A outbreaks that have killed three and sickened more than nine hundred in four states.⁵⁹

In May 2004, Congress passed an extension of NAFTA-CAFTA, the Central American Free Trade Agreement—and President Bush wants to extend the agreement to South America as well to create a Free Trade Area of the Americas (FTAA). Based on their experience with NAFTA, American farmers with small holdings have reason to be concerned.

In free market nonsubsidized competition with less developed countries, the United States is often at a disadvantage. One prominent example is Brazil, the world's biggest exporter of chickens, orange juice, sugar, coffee, and tobacco.⁶⁰ It hopes to add soybeans to this list soon. With low labor costs and a climate that varies little the year round, it is not unusual to have two or even three harvests a year and to see combines clearing fields as planters sow another crop in their wake. Brazil in 2003 passed the United States as the world's largest exporter of beef and has 175 million cattle (as compared to 105 million in the United States).⁶¹ In 2005 the United States had an agricultural trade deficit for the first time in nearly fifty years, demonstrating rising dependence on foreign agricultural production and distribution systems whose safety is questionable.

Shrinking Farmland

If people destroy something replaceable made by mankind, they are called vandals; if they destroy something irreplaceable made by God, they are called developers.

—Joseph Wood Krutch, quoted in *Mother Earth News*, 1990

The U.S. population, in 2007 just over 300 million, continues to increase at a rate of about 3 million each year, with most of the growth occurring in and around urban centers. One result of this growth is loss of arable land to development. A study in 2002 found that the United States is losing 2 acres of mostly prime farmland every minute to development—more than 1 million acres per year or 1 percent of our

cropland every four years, the fastest such decline in the country's history.⁶² The loss of farmland caused by urban sprawl reflects our growing affluence at least as much as the need for new housing. Over the past two decades, the U.S. population increased by 17 percent, while the amount of farmland and green space wrapped into urban areas increased by 50 percent.⁶³

Urban sprawl has been occurring for centuries.⁶⁴ It is a sign of economic health and a democratizing process that gives people more choice over where they live. Sprawl is now the preferred settlement pattern anywhere there is any measure of affluence and where citizens can choose how they live. The difficulty of stopping urban sprawl was clearly illustrated by Measure 37, passed in 2004 by Oregon voters. Since the early 1970s Oregon has had "smart growth laws" that define living patterns, set land prices, and protect open space. These laws attempt to direct development to areas served by existing roads and utilities and curtail new housing and business construction that will sprawl out to rural areas that lack infrastructure development. Oregon has had the best record in the nation of reining in sprawl, according to state officials and national planning experts,⁶⁵ but its record is now crumbling.

Measure 37 compels the government to pay cash to long-time property owners when land use restrictions reduce the value of their property. If the government cannot pay, owners must be allowed to develop their land as they see fit. Because Oregon's local and state governments have almost no money to pay landowners, Measure 37 has unraveled smart-growth laws. Although voters tend to favor protection of farmland and open space, they vote down these protections if they perceive them as restrictions on their own property rights. Preserving farmland often draws a fine line between private property rights and the obligation of a community to protect and preserve land resources for future generations. Who has the right to decide what land will be developed, preserved, or utilized?⁶⁶ Should irreplaceable farmland be taxed differently and treated differently from other property? How should the environmental benefits of farmland, such as floodplain protection, groundwater recharge, and wildlife habitat, be factored into evaluating the determination of "value"? These are contentious and highly charged political issues. In November 2006, voters in at least twelve states considered ballot measures to extend protections on property rights.

Suburban housing developments are typically termed "estates" by land developers, and not only for advertising reasons. Residential lots and house sizes are increasing in size, in the extreme tending toward the vastness of estates owned by British nobility. In 1950 the average single-family home was 983 square feet. By 1970 it was 1,500. Today it is more than 2,300. This has occurred even as the average family size has decreased by 20 percent. Houses on 10-acre or larger lots are re-

sponsible for 55 percent of the sprawl onto farmlands since 1994.⁶⁷ The amount of impervious land surface (an area where water cannot penetrate the soil) owing to human construction is now 43,479 square miles, an area slightly smaller than Ohio (44,994 square miles).⁶⁸ Clearly, rates of farmland loss are high. There is 20 percent less farmland in the United States today than in the 1950 because of commercial development.⁶⁹

It would make more sense for the government to use federal money to protect valuable and irreplaceable farmland than to subsidize preferred crops and large landholders. A federal program does exist for this purpose, the Farmland and Ranch Lands Protection Program, which helps purchase development rights to halt sprawl. The program provides matching funds to state, tribal, or local governments and nongovernmental organizations to purchase conservation easements, in which landowners agree not to convert their land to nonagricultural uses and to develop and implement a conservation program for any highly erodible land. In 2006 \$73.5 million was distributed to applicants under this program.⁷⁰ Requests far exceed available funds.

Most of the population growth is still in cities and surrounding suburbs, and there has been substantial commercial development in suburban areas since World War II. Cities and suburbs are growing at the expense of rural areas. According to the USDA, 3 million acres of American croplands, wetlands, and forests were gobbled up by suburban development in 1997, two-thirds of which were cropland.⁷¹ And the rate is increasing. Conversion of agricultural land to other purposes such as subdivisions and industrial areas is traditionally thought of as happening only around major metropolitan areas, but growing numbers of small and mid-sized cities are also contributing to farmland loss.⁷²

Cities in the United States are compact, dense environments that maximize the use of land per capita and hence minimize the threat to agricultural areas. Suburban development is more damaging to farmland because it tends to be low density, using more land to serve fewer people, and leapfrogs over patches of agricultural areas, making it harder to have a critical mass of farms. Managing a farm surrounded by residential development is fraught with day-to-day operational perils, including nuisance lawsuits by neighbors who build homes in bucolic surroundings but eventually resent the farm sounds and smells.

Land is classified by the USDA in categories of excellence according to its suitability for agriculture. In the best category is land that is nearly level, has ground that is easily worked and favors root penetration, is well drained, is rich in nutrients, retains moisture, and is not easily eroded. Less than one-fifth of existing agricultural land in the United States is rated in this category. Such land, often located in low-lying, fertile valleys, is a farmer's dream. Unfortunately it is also a land developer's

dream, so that as cities and suburbs expand, they swallow up the most productive farmland first. Satellite surveys indicate that land with the most productive soils is being paved over 30 percent faster than less productive land.⁷³ In California, where half the nation's fruits and vegetables are grown, 16 percent of the best soils now underlie urban areas, as do 9 percent of the next best soils.⁷⁴ This trend is national. The area in the United States devoted to roads alone is 8.2 million lane miles, and 10,000 miles of new roads are added each year.⁷⁵ The area being blacktopped each year is 1.3 million acres, an area equal to the size of Delaware. As environmentalist Rupert Cutler once noted, "Asphalt is the land's last crop."

To provide governmental policymakers with information useful for projecting future changes in land use, the Economic Research Service of the USDA created a system to classify remaining farmland into population interaction zones for agriculture (PIZA).⁷⁶ These zones represent areas of agricultural land use in which urban-related activities affect the economic and social environment of agriculture. In these zones, population interaction with farm production activities increases farmland value, changes farm enterprises, and elevates the probability of conversion to urban-related uses.

The growth of cities at the expense of productive farmland not only reduces crop-growing area but also increases air pollution, which decreases crop yields for many miles around.⁷⁷ Prior to the advent of the automobile about a hundred years ago, smog was unheard of. In addition, the smoggy haze that now blankets cities decreases the amount of sunlight available for photosynthesis. And the noxious chemicals in the haze reduce plant growth and crop yield and increase plants' susceptibility to disease and insect attack. For many reasons, urbanization can be regarded as a growing and metastasizing cancer in the agricultural community.

The Price of Land: Location, Location, Location

Buy land. They ain't makin' any more of the stuff.

—Humorist Will Rogers, 1930s

Despite the repeated losses from farming operations, the net worth of small to moderately sized family farm operations has risen more or less continuously since the end of World War II, probably mostly because of land speculation but also because of federal crop subsidies. Subsidies are estimated to inflate the price of land by 25 percent.⁷⁸ Landowners calculate their land's value based on projected income, so because subsidies make the land more profitable, the owner can charge more money, making the land more expensive for future farmers who want to get started. From this perspective, subsidies are essentially a redistribution of wealth, with the money going mainly to already wealthy landowners.

Farm real estate values increased from about \$50 an acre in 1945 to \$1,900 in 2006, more than triple the increase because of inflation alone. Land constituted 79 percent of farm business assets in 2000⁷⁹ and is likely even greater today because of the increasingly rapid increase in land values, which leaped 21 percent from 2004 to 2005 and another 15 percent from 2005 to 2006 (figure 1.5A). Cropland is even more valuable than farmland in general (figure 1.5B).

What Is the Real Value of Land?

I think it inappropriate to call land a “resource” because that term is tied so closely to economics. We can call gold or chrome or coal a resource, but land and people transcend a one-dimensional economic consideration.

—Wes Jackson, *American Land Forum*, 1986

In twenty-first-century capitalism, the worth of things is valued by its cost. Is a new house worth \$290,000 or only \$260,000? Is a used car worth \$8,000 or \$6,000? How about a new suit: \$250 or \$200? A sirloin steak in a restaurant: \$17 or only \$8.95? We all tend to evaluate worth in terms of price. But is there another valid way of evaluating things? And if there is, how and when should it be used?

Land suitable for raising food has a value beyond calculation. We may treasure mountains, deserts, glaciers, and wetlands, but their value can hardly be compared with that of cropland. Yet we preserve wetlands, are saddened by shrinking glaciers, worry about desert ecology, and wax ecstatic about mountain beauty while we ignore the welfare of that part of the earth’s surface on which our food is grown. The explanation for this lack of public concern results in part from the surpluses of food Americans have come to accept as normal. But as we will see later in this book, our apparently ever-increasing bounty may be reaching its limit. We may need to develop a new land ethic. As author E. F. Schumacher noted thirty-five years ago, “Economics, as currently constituted and practiced, acts as a most effective barrier against the understanding of these natural resource problems, owing to its addiction to purely quantitative analysis and its timorous refusal to look into the real nature of things.”⁸⁰

The economic dimensions of farmland protection are important, but farmland protection is not an economic issue. It is a conservation issue with an economic dimension. This difference is real and important. Natural resources are not man-made resources that have value only insofar as they can be converted into dollars. In practical terms, such thinking has too often led economists to conclude that land is best used by being destroyed, that foreclosing forever the possibility for people in the future to harvest food from the land is of no consequence so long as the current owner nets the maximum profit today. Is \$10,000 worth of prime farmland, which humans

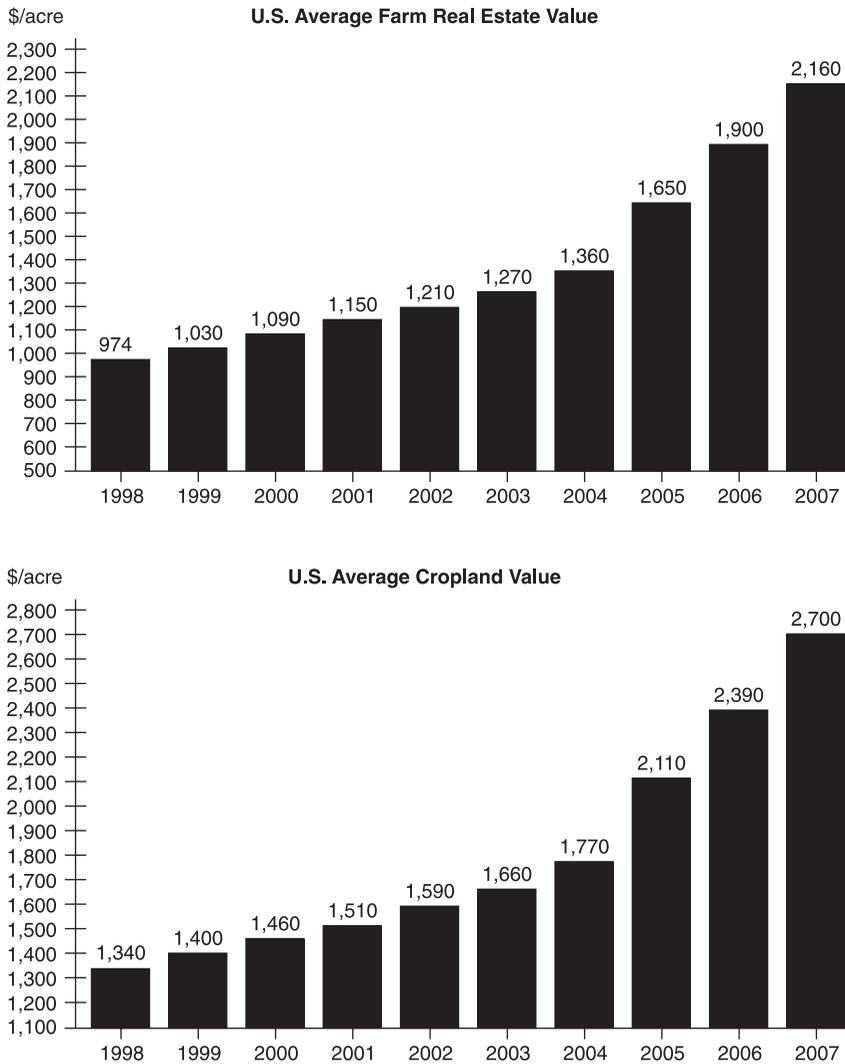


Figure 1.5 Average land values, 1998–2007 (dollars per acre). *Source:* U.S. Department of Agriculture, National Agricultural Statistical Service.

did not make and cannot replace once it is lost, to be given the same value as a \$10,000 car? Surely there is something fundamentally wrong with treating the earth as if it were a business in liquidation. Land is the living, dynamic bridge where crops convert solar energy and atmospheric gases to human food. What is more important than that?

America needs a new land ethic, one that treasures the prime farmlands that have made the United States the breadbasket of the world. We must keep this land for agricultural use only, help farmers survive economically and environmentally so that they can profitably produce from them, and insist that farmlands be used in a way that maximizes their long-term health and preservation. As a recent environmental television ad says, “We only have one planet. We only get one chance.”

The Reliability of Forecasting

Government-to-government assistance is only as good as the recipient government... Hunger is not caused by scarcity of land, nor scarcity of food; it's caused by a scarcity of democracy.

—Frances Moore Lappé, *Rain*, 1985

In the terrible history of famines in the world, there is hardly any case in which a famine has occurred in a country that is independent and democratic with an uncensored press.

—Amartya Sen, Nobel laureate in economics, 1998

Will the United States always be the world's major breadbasket? Will federal crop subsidies ever end? Will the fortunes of the small farmer continue to deteriorate? Forecasting the future is almost impossible because of the unpredictability of new discoveries and inventions. In the agricultural realm, I need only cite the famous forecast of Thomas Malthus in his 1798 publication, *An Essay on the Principle of Population*, in which he “proved” mathematically the inevitability of mass starvation because population would inevitably outrun the food supply. Malthus noted that population increases geometrically (2, 4, 8, 16, 32, ...) but the food supply can increase only arithmetically (5, 10, 15, 20, 25, ...) so that starvation is inevitable. His logic seemed irrefutable. Who can argue with mathematics? As Sally Brown expressed in a *Peanuts* comic strip, “People are everywhere. Some people say there are too many of us, but no one wants to leave.”

In 1900, Sir William Crookes of Great Britain predicted, “It is almost certain that within a generation the ever-increasing population of the United States will consume all the wheat grown within its borders, and will be driven to import, and like ourselves, will scramble for the lion's share of the wheat crop of the world.”⁷⁹

More recently, in 1968, latter-day Malthusian Paul Ehrlich of Stanford University said in his book *The Population Bomb* that “the battle to feed humanity is over. In

the 1970s the world will undergo famines . . . hundreds of millions of people (including Americans) are going to starve to death.” In 1969 Ehrlich was more specific: “By 1985 enough millions will have died to reduce the earth’s population to some acceptable level, like 1.5 billion people” Since 1969 the earth’s population has continued to rise, from 3.6 billion to 6.7 billion today. Ehrlich also predicted that “by 1980 the United States would see its life expectancy drop to 42 because of pesticides, and by 1999 its population would drop to 22.6 million.” Life expectancy in America has continued to rise since Ehrlich’s 1969 prediction, from 70.5 years to 77.6 years in 2003, with the population increasing 50 percent, from 200 million to 300 million. In his 1975 book, *The End of Affluence*, he envisioned the president dissolving Congress “during the food riots of the 1980s,” followed by the United States suffering a nuclear attack for its mass use of insecticides. Insecticides are now widely used throughout the world.⁸¹

Lester Brown of the Worldwatch Institute is another modern Malthusian who has echoed the concerns of Thomas Malthus and Sir William Crookes in two books, *Who Will Feed China?* and *Tough Choices: Facing the Challenge of Food Scarcity*. Brown envisioned China’s population growth rising to 1.7 billion and commandeering all of the world’s grain. This population estimate has turned out to be much too high. The latest forecasts indicate that because of its one-child policy, China’s population in 2050 will plateau at 1.5 billion, only 200 million more than its population of 1.3 billion today.⁸²

The prognostications of Malthus, Crookes, and Ehrlich were well meaning and based on reasonable assumptions, but they were wrong. Forecasts of world population in the 1990s envisioned stabilization at 12 billion, but the latest predictions of world population growth foresee stabilization at a number only about one-third larger than today: 8.9 billion.⁸³ Experts agree that food production now is more than adequate to feed today’s 6.7 billion people and believe that there will not be a food shortage with 9 billion either.⁸⁴ Food shortages in Third World nations now are not due to a worldwide inability to produce food but rather to political instabilities such as wars, inadequacies of transportation, dictatorships, government subsidies to food producers in wealthy countries, poverty in developing countries, and other factors unrelated to photosynthesis and soil fertility. As the quotations at the start of this section say, the problem is a shortage of democratic, representative governments, not a shortage of food.

Who could have predicted the explosive development of pesticides in the post-World War II era, or the development of genetically modified crops in the 1990s? One does not have to be a wild-eyed optimist to feel comfortable with mankind’s ability to feed itself if political factors do not intervene. Like current oil shortages, food shortages are political problems and do not originate in chemistry, biology, or

a lack of solar radiation for photosynthesis. As a governmental group of agricultural experts noted in 2002.

Over the next few decades, there are no obvious biological limits on yields that would prevent continued increase. In the longer term, far greater changes are possible. Industrialization of agriculture could mean that raw biomass [crops] is processed into livestock feed and processed food products, using biotechnology-generated microbial organisms—greatly reducing the need for conventional crop production as we now recognize it. As we try to look forward 50 and 100 years, it is not clear whether the crops that will be grown then will resemble the crops grown today. . . .

Biotechnology and precision agriculture are likely to revolutionize agriculture over the next few decades—much as mechanization, chemicals, and plant breeding revolutionized agriculture over the past century. . . . Biotechnology has the potential to improve adaptability, increase resistance to heat and drought, and change crop maturation schedules.”⁸⁵

Today’s apparent barriers are tomorrow’s accomplishments.

