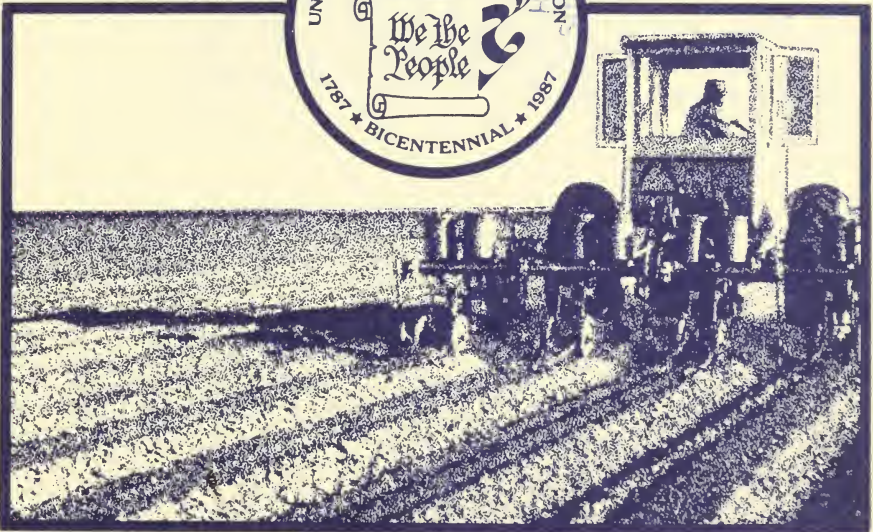
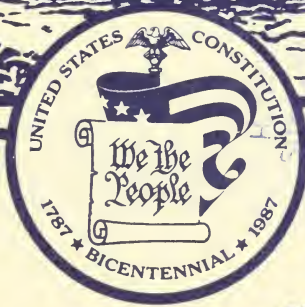


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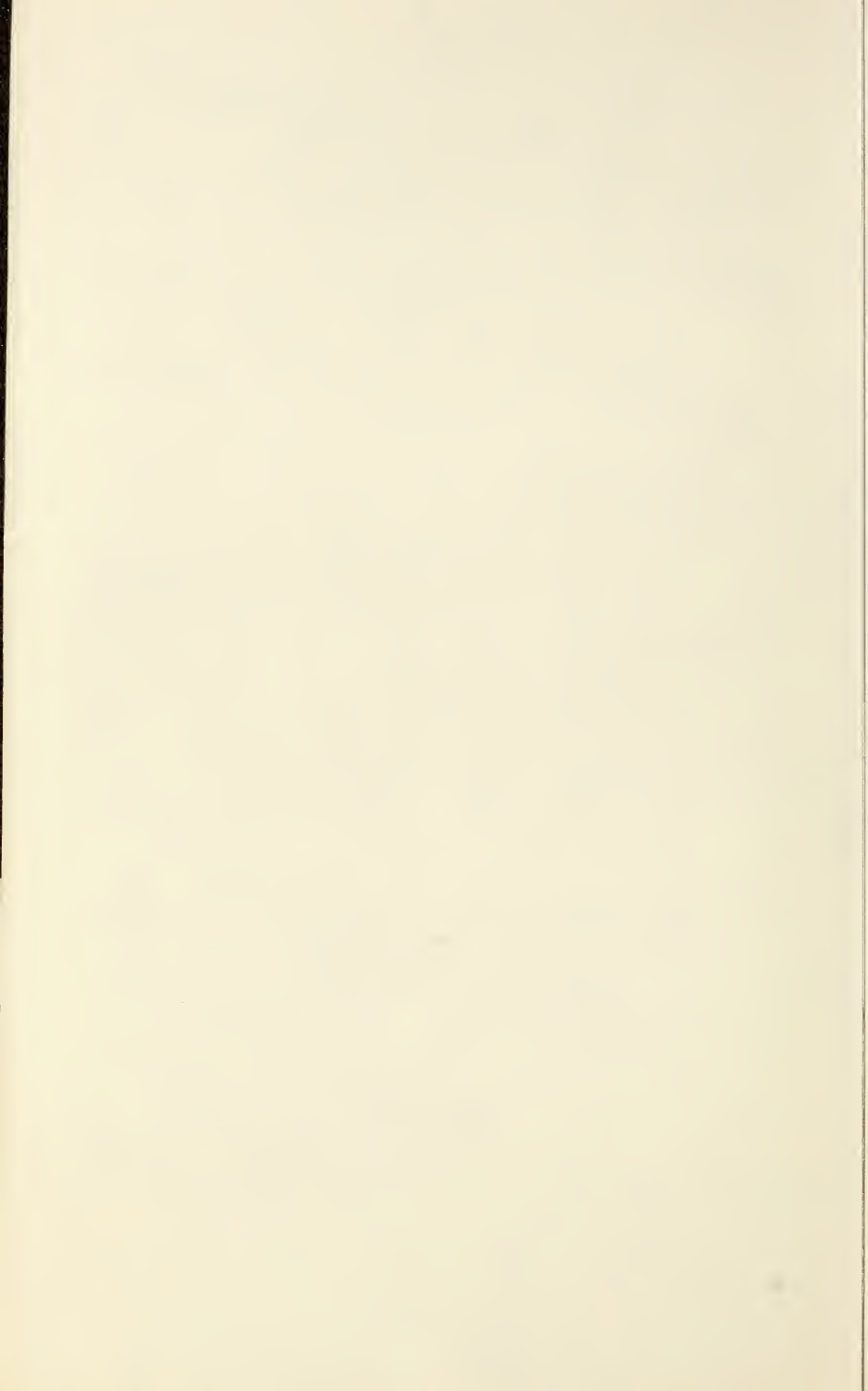
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FOREWORD

AGRICULTURE AND THE U.S. CONSTITUTION

In 1987, the United States is celebrating the 200th anniversary of the U.S. Constitution, which was signed in Philadelphia September 17, 1787. A central part of this celebration is a recognition of the important connections between agriculture and the Constitution.

The country in 1787 was a loosely knit nation of farmers, an agrarian society. Parts of the Constitution were written to help solve farmers' problems. And the system of government it created allowed a strong agriculture to develop in this country.

Democracy Took Root in a Nation of Farmers

About 90 percent of the people lived and worked on farms, and most owned their land. As George Washington told Congress in 1796, "...with reference either to individual or national welfare, agriculture is of primary importance."

The presence of so many farmers in North America had an inevitable impact on the form of government produced by the Constitution.

The agricultural system in North America was virtually unique. In Europe, where most land was owned by aristocrats, only a few people were in the middle class, and the masses were poor and illiterate. But in North America, land was cheap and readily available, so this became a land of small farmers, even in the plantation South. Some historians argue that our very form of government would not have evolved had this not been a land of "small" farmers.

With wealth widely distributed, U.S. residents enjoyed a higher standard of living, as well as more individual political and economic responsibility. Participation in elections was widespread, even though only property owners could vote and hold office in many States.

Whether in isolated frontier settlements or in New England towns, U.S. residents soon became accustomed to governing themselves. They developed the experience and the ability to make the world's first modern republic a success.

Some founding fathers made a direct connection between agriculture and democratic institutions. The country's great strength, they believed, was its independent yeoman farmers, who could not be swayed like the mobs of Europe.

To Madison and Jefferson the real danger for the future lay in the growth of cities. (Although Jefferson was not at the constitutional convention in Philadelphia, his ideas had a great impact there.)

As Jefferson said at the time the Constitution was drafted, "I think our governments will remain virtuous for many centuries; as long as they are chiefly agricultural... When they get piled upon one another in large cities, as in Europe, they will become as corrupt as in Europe." Or, as he put it more bluntly, "Those who labor in the earth are the chosen people of God."

Farmer Framers

Of the 55 delegates to the constitutional convention, 22 derived at least half their income from agriculture, and they had an interest in issues that affected farmers.

The farmer-delegates were not typical American farmers. Most were slave-owning southern planters, a few were aristocratic northern farmers, and several owned country estates or had other agricultural interests.

In addition to these 22, several other delegates grew up on farms before they became lawyers or merchants. A few were land speculators who sold land to western farmers.

The strong central government that was formed under the Constitution brought farmers an important benefit: increased agricultural trade, both with other countries and among the States. This resulted from being dealt with on an equal basis by other nations, whereas under the Articles of Confederation—the form of government in effect from 1781 to 1788—the weak national government was treated with little respect overseas.

As long ago as the eighteenth century, farmers produced for the market as well as for their own families. Even then, America was heavily dependent on exports for much of its national wealth. The new nation exported mainly raw agricultural materials and had to import most of its manufactured goods.

Its chief exports were tobacco, rice, naval stores, indigo, wheat, and flour that went principally to Europe and the Caribbean. In 1787, this trade was in a precarious position.

After the Revolution, the British had cut back on importing U.S. goods and severely restricted trade with the lucrative markets of the Caribbean. The U.S. government under the Articles of Confederation could not control commerce or even levy an effective tariff or internal tax.

The States had their own individual trade policies, and passed a confusing array of tariffs and other trade restrictions.

The Constitution changed all that. It strengthened the Govern-

ment's hand in trade negotiations, permitted a national tariff on imports, and took away State jurisdiction over interstate trade. To ensure that exports would not be hindered, the Constitution explicitly forbade export tariffs.

Land to Grow On and to Grow Into

The need for more land was another factor that linked farmers with the Constitution.

Many U.S. citizens hoped a strong government could protect Western States, allow farmers to settle the western lands, and eliminate foreign meddling in U.S. affairs.

Farmers had long been in the vanguard of western settlement; the West offered cheap land to anyone willing to settle there, which was especially attractive to poor farmers, to those who had worn out their eastern lands, and to the surplus children of farmers in settled areas.

Ordinances by Congress in 1785 and 1787 guaranteed that the western lands ceded by coastal States would be available for purchase from the National Government and that the new States formed there would enter the Union on the same basis as older States.

But the future of farmers who had settled over the Appalachians was jeopardized by the inability of the Government under the Articles of Confederation to prevent encroachments by Britain and Spain.

Spain's threat was the worst, for its government often denied American farmers access to the port of New Orleans (essential for western shipping) and attempted to get western settlers to secede from the United States.

The Constitution created a strong central government which could field an army and navy to protect settlers and traders in the western lands, and later negotiate with other countries and buy land, such as the Louisiana Territory in 1803.

Farm Credit and a Stable Currency

Farm credit was another agricultural issue which led to the Constitution.

Farmers had always had difficulty obtaining credit to buy land, and many colonies loaned money on real estate directly to farmers by issuing paper money.

With the advent of hard times after the Revolution (due in part to the loss of British trade), several of the new States issued so much paper money that it became seriously depreciated.

This led to a general price inflation, which benefited farmers but hurt creditors. States that refused to respond to farmers'

demands for easy credit faced political upheaval.

This was the situation which led to Shays' Rebellion in Massachusetts, during which angry farmers and former soldiers prevented local courts from foreclosing on farmers and released debtors from prison.

Thus, many people, particularly merchants and creditors, wanted a new National Government that would restrict the right of States to issue money, establish a standard coinage, and better protect property rights.

Farmers' Responses to the Constitution

The Constitution was written by people who held distinctly different visions of the country's future. The remarkable group of men who produced it were able to negotiate among these different visions. The Constitution and the government it created have themselves been a system to handle conflict for the past 200 years.

In the Madison camp, rural delegates feared the growth of industry and wanted to preserve the agrarian character of American society. Delegates from cities, especially those who agreed with Hamilton, saw a nation with a strong central government and a diversified economy which balanced manufacturing, commerce, and agriculture.

Both sides saw advantages for themselves in the new Constitution. Madison believed the Constitution would significantly aid agriculture by allowing the new government to open new markets overseas, secure western lands, improve internal transportation, and protect the rights of States and individuals.

Hamilton believed the new government would be strong enough to preserve order and encourage industry through a tariff on imported goods, a central banking system, and sound credit policies. He argued that the growth of industry, far from hurting agriculture, would provide markets for farm products.

Both sides agreed that the new Constitution was necessary to prevent the republican experiment from falling apart.

Farmers as a whole were ambivalent about the Constitution and it was largely opposition from farmers that made it so difficult to get the Constitution ratified by the States.

There were close votes in several States, such as Massachusetts, Virginia, and New York, and the last State (Rhode Island) did not join until 1790. Antifederalists, as they were called, had experienced strong control by their Colonial rulers and objected to the very idea of a strong government that might trample on individual rights.

They also believed the Constitution would benefit mainly cities

and encourage speculation and corruption.

On the other hand, the arguments of men like Madison and the presence of so many rural delegates to the constitutional convention no doubt helped convince many farmers to support the new government.

The debate over the meaning of the Constitution did not die with its ratification, but dominated politics for the next two decades.

By 1815, supporters of Jefferson and Madison had become the majority party and they came to accept much of Hamilton's program without losing faith in agrarian values. Those values have been a part of American politics ever since.

—Douglas E. Bowers, *Historian, Economic Research Service, USDA.*

PREFACE

The contents of the Fact Book of U.S. Agriculture are organized to reflect the structure of modern agriculture and provide pertinent information on its history, especially as that history pertains to the U.S. Constitution, produced 200 years ago. The major subdivisions are the following:

I. *Farm Production, Income, and Values* deals with farm production goods, the industries and service organizations that produce the goods and services that farmers buy to produce food and fiber, farmers' credit arrangements, farm income and financial values.

II. *The Farming Operation* covers the farm business itself with its combinations of land, labor, management, and capital to produce farm products.

III. *International Agricultural Trade and Aid* gives a brief picture of trade as it involves U.S. farmers and the balance of international payments, and also touches on the international distribution of U.S. food through commercial and charity channels with which USDA personnel work.

IV. *Food Marketing, Protection, and Distribution* describes the competitive system that converts farm products into safe consumer products ready for use commercially and for use as charity in homes, restaurants, and institutions, including local social welfare organizations and groups of Indians and Alaska Natives. The system handles the products from farmer to consumer, as well as consumer education, advertising, and other elements of marketing.

V. *Farm Production and Marketing Programs* deals with activities of the U.S. Department of Agriculture and other Government and private agencies that support and regulate modern agriculture so as to maintain the strong family farm system insofar as possible.

VI. *Conservation: Soil, Water, Trees* tells of some of the conservation problems facing U.S. agriculture and how Government agencies try to help farmers resolve those problems.

VII. *Agricultural Planning, Productivity, and Protection Services* describes activities of various USDA agencies that support modern agriculture—research, inspection, crop and livestock protection, Cooperative Extension, statistics, regulatory activities, grading services, and economic studies.

VIII. *The Rural Social Environment* pertains to the population, environment, and social problems of smaller towns and the open country and how it was 200 years ago.

The Fact Book of U.S. Agriculture is intended as a handy source of information for reporters; editorial writers; farm organi-

zation leaders; agribusiness managers; students; and others who study, speak, and write about agriculture.

More detailed tabulations and charts will be found in *Agricultural Statistics* and the *Handbook of Agricultural Charts*, both revised yearly. *Agricultural Statistics* is for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Single copies of the *Handbook of Agricultural Charts* are free on request. Other selected references are listed in Appendix IV.

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INTRODUCTION

THE NATION'S AGRICULTURAL INDUSTRY

Agriculture is the Nation's biggest industry. Farm assets totaled \$771 billion on December 31, 1985. And the Nation's food and fiber system accounted for 17.5 percent of total gross national product in 1985.

Agriculture is also the Nation's largest employer. About 21 million people work in some phase of agriculture—from growing food and fiber to selling it at the supermarket. Farming itself employs roughly 2.7 million workers, as many as the combined work forces of transportation, the steel industry, and the automobile industry.

The Nation's agricultural production is conducted by 2.18 million farms. Recent tabulations show that in 1984:

- 1,391,000 farms (59.8 percent of all farms) sold less than \$20,000 worth of farm products per farm.
- 247,000 (10.6 percent) sold farm products worth \$20,000 to \$40,000.
- 353,000 (15.2 percent) sold farm products worth \$40,000 to \$100,000.
- 337,000 (9.8 percent) sold farm products worth more than \$100,000. Of these farms, 229,000 had sales totaling \$100,000 to \$249,000; 77,000 had sales of \$249,000 to \$499,999; and 31,000 had sales of \$500,000 and over.

Agriculture requires the services of about 18.3 million people to store, transport, process, and merchandise the output of the Nation's farms.

Here are a few examples of where these people work:

- Meat and poultry industry, including meatpacking, prepared meats, and poultry dressing plants, employs about 370,000 people, and has a payroll of \$4.5 billion.
- Dairy industry, including manufacturers of such products as fluid milk, concentrated and dried milk, cheese, butter, and ice cream, employs nearly 162,000 people, and has a payroll of \$1.6 billion.
- Baking industry, including plants for making bread, biscuits, and crackers, employs over 215,000 people and has a payroll of \$2.1 billion.
- Canned, cured, and frozen food plants employ nearly 280,000 people and have payrolls of \$2.8 billion.
- Cotton mills and finishing plants employ nearly 145,000 people and have payrolls of \$1.6 billion.

That adds up to approximately 18 percent of all jobs in private enterprise.

AGRICULTURE GETS FOOD TO PEOPLE WHERE THEY WANT IT

The U.S. farmer is linked to the people by a complex food marketing system. In 1985, consumers spent \$344 billion for U.S. farm-produced foods. About \$257 billion of that was to get the food from the farm to tables of U.S. residents. The food—more than 300 million tons of it—was assembled, inspected, graded, stored, processed, packaged, wholesaled, and retailed. To reach people, this food traveled across 173,800 miles of railroads, 3.4 million miles of highways, and 26,000 miles of improved waterways.

The foods that poured into supermarkets came in 10,000 to 15,000 different products, many of which did not even exist 5 years ago and may very well not exist 5 years from now. That's because Americans are attracted to newer foods with more built-in conveniences, as well as to food in attractive packages that preserve the quality.

Packaging and transportation cost \$43 billion last year, and might well have cost considerably more except for vigorous competition among truckers and railroads, and recent innovations in packaging and handling methods. The food marketing system has developed a computerized checkout, and is working on an inventory and ordering system that might further streamline food retailing and help to simplify shopping.

FARMERS ARE EFFICIENT PRODUCERS

U.S. farmers today produce over 80 percent more crop output on an acre of land than did their fathers. Today, 1 hour of farm labor produces 16 times as much food and other crops as it did in the 1919-21 period.

One farmworker now supplies enough food and fiber for 75 people. Only 10 years ago, the farmworker was producing enough for 58. Because of the farmer's efficient output, U.S. residents can enjoy a satisfying quantity and variety of food.

In 1985, for example, U.S. residents consumed an average of 144 pounds of beef, veal, pork, lamb, and mutton; 70 pounds of chicken and turkey; 88 pounds of fresh fruits; 75 pounds of fresh vegetables; 309 pounds of dairy products; and 97 pounds of potatoes.

Farmers produce not only enough for everyone, but also enough to make large quantities of farm products available for international trade.

The United States exports more farm products than any other country in the world.

In 1985, production from one-quarter (87 million acres) of America's cropland went overseas.

From 1971 through 1981, farm exports set successive records, reaching a peak of \$43.8 billion in fiscal year 1981. Because of the higher exchange rate, greater competition, and reduced foreign demand, however, exports in fiscal year 1985 totaled \$31.2 billion and would decline further in 1986.

Even so, farm exports contributed a net of \$11.5 billion to the U.S. balance of trade in 1985.

RISING AGRICULTURAL PRODUCTIVITY

Total agricultural production is more than 2-1/2 times the levels of that in 1930, even though the agricultural resource base has not substantially changed. The growth in farm output has come from the higher productivity of agricultural resources rather than from greater input use. (Also see productivity data in Chapter 75.)

The aggregate number of breeding animals and the total inputs to agriculture in 1930 differ by less than 5 percent from the amounts used in 1985. Yet crop production then was 2.5 times the 1930 level, livestock production 2.7 times the 1930 level, and total farm output about 2.8 times the 1930 level. This implies that the productivity of land is more than 2-1/2 times the productivity in 1930, that breeding animals are 2-1/4 as productive as in 1930, and that overall the farm sector is 2-3/4 times as productive as in 1930.

The new technology which made these gains possible changed the mix of other inputs used. Fertilizer consumption in 1985 was 14 times 1930 levels, feed concentrates 2.3 times 1930 levels, tractor horsepower 12 times 1930 levels, and tractor numbers 5 times the 1930 number.

On balance, purchased inputs in 1985 were 2.6 times those of 1930, while the farm labor input was only 18 percent of farm employment in 1930. As a result, farms have expanded in size and become more dependent on capital and purchases from the nonfarm economy.

If the trends of the last 15 or so years continue, total farm output per unit of input should grow at about 2 percent per year, crop production per acre should increase about 2 percent per year, and the production per breeding unit should increase about 1 percent per year. Significant changes in the prices of farm inputs relative to farm commodity prices, or changes in the mix of commodities produced, will affect the actual trends that occur.

FARMERS ARE CONSUMERS AS WELL AS PRODUCERS

Like everyone else, the U.S. farmer is a consumer and a taxpayer, as well as a producer.

Farmers pay about \$4.4 billion in farm real estate taxes annually, and \$500 million in personal property taxes.

In 1985, farm operators spent about \$136 billion for goods and services to produce crops and livestock. They had available \$30.5 billion in personal income from farm sources and \$40.8 billion from nonfarm sources to spend for personal taxes, investments, and for the same things that city people buy.

Farmers' 1985 purchases included the following:

- \$7.7 billion for farm tractors and other motor vehicles, machinery, and equipment. About 80,000 employees are required to produce this farm equipment.
- \$13.7 billion for fuel, lubricants, and maintenance for machinery and motor vehicles used in the farm business. Farming uses more petroleum than any other single industry.
- \$23 billion for feed and seed.
- \$7.3 billion for fertilizer and lime.
- 29 billion kilowatt-hours of electricity, or about 2 percent of the Nation's total. That's more than the annual residential use in all New England States plus Maryland, Kentucky, and Washington, D.C.

Like everyone else, farmers feel the pinch of inflation. In the last 10 years, wage rates for farmworkers have gone up 65 percent, tractors and self-propelled machinery cost 94 percent more, taxes are up 62 percent, and feeder livestock prices are up 58 percent.

Overall, the average cost of commodities, interest, taxes, and farm wage rates has climbed 72 percent in the last 10 years. These increases in the average include the much lower rates of inflation experienced in the past few years.

PEOPLE GET MORE FOOD FOR THEIR MONEY

Not only have food prices risen comparatively little in the past few years, family income buys considerably more food today, partly because agriculture has become much more efficient and partly because consumer incomes have risen faster than food prices. For example, here's what the average U.S. factory worker could buy with an hour's pay in 1950 and in 1985.

Table 1. The amount of food the average factory worker's hourly pay would buy

Food item	1950	1985
White bread	10.1 lbs.	15.5 lbs.
Frying chickens	2.5 lbs.	11.2 lbs.
Milk	8.0 qts.	15.1 qts.
Fresh potatoes	32.7 lbs.	41.2 lbs.
Eggs	2.4 doz.	10.7 doz.
Pork	2.7 lbs.	5.3 lbs.

People's diets are more varied. They are eating 35 percent more poultry but 8 percent less beef per person than they did 10 years ago. They eat more fresh vegetables (18 percent) and more fresh fruits (13 percent).

WHAT THE FARMER RECEIVED (1985 ANNUAL AVERAGE)

As gross payment from retail food prices, U.S. farmers in 1985 receive:

- 31 cents per \$1 spent in grocery stores for U.S. farm-grown food.
- 55 cents per \$1 spent for Choice beef.
- 52 cents for eggs selling for 88 cents per dozen at retail.
- 4.1 cents for the wheat in a 53-cent loaf of white bread.
- About 56 cents for a \$1.13 half-gallon of milk.

For their labor, capital, and management of the farms, farmers received:

- \$142.1 billion in gross sales of crops and livestock, about \$60,250 per farm. Their net return for farm resources was \$30.5 billion.

I. FARM PRODUCTION, INCOME, AND VALUES

1. INPUTS FOR AGRICULTURE

The three basic "inputs" for agricultural production are land, labor, and capital.

Land is no longer the major production tool. The productivity of the land now depends upon the skill and knowledge with which capital is applied: The use of mechanical power and machinery, fertilizer, lime, better seed, pest control chemicals, and the technology applied to conserve and enhance the land while in productive use.

The total volume of all resources in agriculture—land, labor, machinery, and supplies—has changed little since 1955.

The composition of inputs, however, has changed drastically as farmers have struggled to be more productive and more efficient. Farm labor inputs have declined rapidly; farm real estate has remained relatively constant. All other inputs, chiefly purchased, have increased rapidly. Purchased inputs are about two-thirds greater than in 1955; nonpurchased inputs have declined more than one-third.

2. LAND

More than half of the 2.3-billion-acre land area of the United States is used to produce crops and livestock. The rest is distributed among forest land (25 percent); urban, transportation, and other uses (12 percent); and unused lands.

Our cropland resources in 1977, according to the Soil Conservation Service (SCS) National Resources Inventory, consisted of 413 million acres, of which 368 million acres are cultivated for crops, 33 million acres are used for hay, and 12 million acres are in other cropland uses. About 56 percent of these areas is prime farmland, which is the best land for producing food and fiber.

The Nation has nearly 1 billion acres of non-Federal rural land currently being used for pasture, range, forest, and other purposes. About 127 million acres are suitable for conversion to cropland if needed. Of this, 36 million acres have a high potential for conversion to cropland, and 91 million acres have a medium potential. The remaining rural land has little or no potential for conversion to cropland.

This means that the cropland reserve is limited to about 13 percent of the remaining non-Federal land. Most of this land would require careful soil and water management if brought into

intensive agricultural use, and doing so would further diminish our supply of pasture, range, or forest land.

During the 1967-77 period, about 3 million acres of rural land were converted annually to urban development, large water impoundments, transportation, and other built-up uses. There are 90 million acres in these uses. Another 4 million acres of small built-up areas, less than 10 acres in size, are included as "other land." About one-third of the converted area was land formerly cropped. Another 200,000 acres per year are developed as small water impoundments.

Table 2.—U.S. land ownership and use in 1982

Data provided by Soil Conservation Service, U.S. Department of Agriculture

Type of land	Hectares (millions)	Acres (millions)	Percentage of total
Federal land	163	404	21
Non-Federal land	606	1,498	79
Total land area	769	1,902	100

Table 3.—Non-Federal use of land in the United States, excluding Alaska, in 1982

Data provided by Soil Conservation Service, U.S. Department of Agriculture

Type of land	Hectares (millions)	Acres (millions)	Percentage of total
Cropland	170	421	28
Pastured land	54	133	9
Rangeland	164	406	27
Forest land	159	394	26
Small water areas	4	10	1
Urban, built-up, and transportation areas less than 10 acres in size	30	74	5
Other land	24	60	4
Total land area	605	1,498	100

¹Does not include 14 million acres of non-Federal land in Alaska.

3. WATER

U.S. precipitation varies from nearly none in Death Valley desert in California to more than 100 inches per year in some areas—for example, the Olympic Mountains in Washington. The average for the 48 mainland States is 30 inches per year—a total of 1,570 trillion gallons. This total does not change much from year to year, but precipitation at any location may vary greatly.

Two-thirds of this water evaporates from wet surfaces or soaks into the soil to sustain crops, pastures, rangeland, and forests. The other third percolates deep into the ground or finds its way into streams. Water in the streams can be used for navigation, recreation, or power generation. Or it can be diverted from streams and (with water pumped from underground) used for irrigation, industry, and other purposes.

In 1978, 52.4 million acres of land were irrigated in the 50 States, an increase of 17.5 million acres since 1964. Most of the acreage increase in irrigated land occurred in the 17 Western States and Louisiana. The greatest percentage increase since 1964 (99 percent) occurred in the 31 Eastern States, Alaska, and Hawaii.

Table 4.—Specified U.S. crops harvested by acres irrigated in 1982

Crop	Irrigated acreage ¹ (1,000 acres)
Corn	9,337
Hay	8,496
Cotton	3,423
Land in orchards	3,342
Wheat	4,518
Rice	3,232
All vegetables harvested for sale	2,024
Sorghums for grain or seed	2,388
Barley	1,949
Soybeans	2,319
Irish potatoes	794
Sugar beets for sugar	545

¹All farms

Source: 1982 Census of Agriculture, Bureau of the Census, U.S. Department of Commerce. These data will not change until the 1987 Census Bureau figures are available.

Water withdrawn and then returned to streams may be used again as long as acceptable quality is maintained. Only water that is used up (mainly by evaporation), so that it does not return to streams, reduces the total usable water supply. Agricul-

ture uses 83 out of every 100 gallons that are lost.

Management of water is becoming increasingly important as use approaches available supply. Shortages can occur in any region in any year. In some Western States, current use is already pressing heavily on available supplies. Cities and industries are using increasing amounts and thus intensifying supply and treatment problems. Water pollution is today a major conservation problem in most regions.

The total supply of water will not increase. But more water may be made available for use by demineralization, storage in surface reservoirs, recharging underground aquifers of water-bearing rocks, converting brushland to grass in lower rainfall areas, and managing vegetative cover, including forests, so as to capture and retain more snowfall.

Water quality and quantity can be improved and energy use reduced by improving irrigation systems. Some present systems use less than half of the water they receive. An average water-use efficiency of 70 to 75 percent is an achievable goal.

4. FARM LABOR

Since the turn of the century, farm employment has decreased considerably, falling from 13.6 million in 1910 to 3.1 million in 1985. During the last decade, the number of family operators and unpaid family members continued to decline, while hired farm employment appears to have stabilized after the long-term downward trend of previous years.

Family workers were still the dominant labor source, but accounted for a smaller proportion of total farm employment. In 1985, family farm labor comprised about two-thirds of farm employment, compared to three-quarters during the 1960's. Growth in size of farms and in the amount of farm labor required per farm contributed to substitution of hired farmworkers for family labor on individual farms.

In 1983, there were 2.6 million persons who did some hired farmwork during the year. Hired farmworkers in 1983 were predominantly young (50 percent under 25 years), male (78 percent), and lived in nonfarm residences (84 percent).

About 73 percent were white, 13 percent were Hispanic, and 14 percent were black and others. Five out of 10 farmworkers were heads of household; the remainder were spouses and other family members. The largest proportion (38 percent) lived in the South.

In 1983, there were 226,000 migrant workers who crossed county lines and stayed overnight to do hired farmwork. About 54 percent traveled distances of 500 miles or more to reach

their farm jobs.

Migrants in 1983 tended to be male (85 percent) and had a median age of 32 years. About 46 percent of the migrants were white, 15 percent were Hispanic, and 39 percent were black and other groups.

Most of the hired farm work force were seasonal workers who worked for a few days or months during peak planting and harvesting periods. In 1983, only 13 percent worked full time for 250 days or more; almost three-fourths worked on a casual or seasonal basis for less than 150 days.

The majority of the hired farmworkers had a weak labor force attachment. In 1983, only 57 percent were in the labor force most of the year, while the remainder cited attending school or doing housework as their primary activity. About 29 percent of all farmworkers cited hired farmwork as their chief activity during the year, and another 19 percent cited nonfarm work as their primary employment status.

Farmwork continues to be a relatively low-paying occupation. In 1983, all hired farmworkers averaged \$4,815 in annual earnings from all sources, with \$3,138 (65 percent) from farmwork.

The average earnings for all U.S. private sector nonagricultural production workers was \$14,596.

Earnings varied considerably among different groups of farmworkers. For example, workers citing hired farmwork as their primary activity received an average of \$8,017 in total earnings; almost all (96 percent) of this came from farmwork.

Persons citing nonfarmwork as their major activity averaged \$8,609 in annual earnings, with only 15 percent received from farmwork.

Persons not in the labor force most of the year received an average of \$1,409, with 73 percent from farm earnings. Migrant farmworkers received about \$6,000 in annual earnings, with 78 percent coming from farmwork.

These data suggest that hired farmworkers are not a homogeneous group of workers. They vary by demographic characteristics, employment experiences, and earnings.

Table 5.—Indexes of total farm input and major input subgroups, United States, 1920-84

(1977 = 100)

Year	Total inputs			Farm Labor ³	Farm real estate ⁴	Mechanical power and machinery ⁵	Agricultural chemicals ⁶	Feed, seed, and livestock purchases ⁷	Taxes and interest ⁸	Miscellaneous ⁹
	All	Non-purchased ¹	Purchased ²							
1920	95	198	37	485	105	27	5	23	62	65
1921	92	188	37	447	103	27	3	26	74	59
1922	93	191	38	463	104	26	4	25	72	60
1923	94	192	38	466	104	27	4	25	72	60
1924	96	194	40	471	104	27	5	31	71	62
1925	97	196	40	481	103	28	5	28	69	63
1926	98	196	42	482	103	29	5	29	71	65
1927	97	192	42	464	104	31	5	29	72	61
1928	99	195	43	472	105	32	6	29	73	62
1929	99	195	44	468	107	33	6	28	75	62
1930	99	195	43	463	104	34	6	27	76	60
1931	98	196	42	473	102	32	5	24	77	63
1932	95	191	39	457	100	30	4	25	80	61
1933	93	188	39	456	100	27	4	26	77	60
1934	87	172	38	409	100	27	5	25	70	55
1935	89	174	40	425	102	28	5	23	64	55
1936	91	172	43	413	102	29	6	31	69	54
1937	95	182	45	446	104	32	7	30	64	59
1938	93	175	45	416	104	33	7	31	70	55
1939	96	175	48	418	105	34	7	37	73	56
1940	97	175	50	417	107	36	9	39	74	57

Table 5.—Indexes of total farm input and major input subgroups, United States, 1920-84—Continued

(1977 = 100)

Year	Total inputs			Farm Labor ³	Farm real estate ⁴	Mechanical power and machinery ⁵	Agricultural chemicals ⁶	Feed, seed, and livestock purchases ⁷	Taxes and interest ⁸	Miscellaneous ⁹
	Non-purchased ¹		Purchased ²							
	All									
1941	97	174	51	410	105	37	9	42	74	57
1942	100	183	51	420	103	44	10	44	75	55
1943	102	184	52	414	102	47	11	48	78	57
1944	103	185	53	411	101	49	13	48	80	59
1945	100	178	53	385	102	50	13	50	82	58
1946	99	171	54	369	106	49	14	49	82	59
1947	99	167	56	350	106	54	15	51	82	60
1948	100	168	57	340	107	62	16	52	80	63
1949	102	168	60	328	108	68	18	56	83	66
1950	101	166	60	309	109	72	19	58	83	63
1951	104	169	63	309	109	77	21	62	84	68
1952	104	166	64	295	108	81	23	63	86	67
1953	103	164	64	284	108	82	24	63	87	67
1954	102	161	64	273	108	82	24	65	87	65
1955	102	158	65	263	108	83	26	66	89	68
1956	101	152	66	248	106	84	27	69	89	65
1957	98	145	66	231	105	83	27	68	88	68
1958	98	140	69	221	104	83	28	73	89	71
1959	99	138	72	215	105	84	32	77	94	75

1960	98	131	74	206	103	83	32	77	95	77
1961	97	128	74	198	103	80	35	81	96	78
1962	97	125	76	189	104	80	38	83	98	81
1963	97	121	78	183	104	79	43	83	99	83
1964	97	119	80	173	104	80	46	85	101	87
1965	96	113	80	156	103	80	49	86	101	85
1966	96	111	83	146	102	82	56	89	102	82
1967	98	110	86	142	104	85	66	92	102	80
1968	97	109	86	137	102	86	69	89	102	85
1969	97	108	87	132	102	86	73	93	101	85
1970	97	107	88	126	105	85	75	96	102	89
1971	98	105	91	123	103	87	81	102	101	89
1972	97	103	92	116	102	86	86	104	102	92
1973	98	103	93	114	100	90	90	107	102	90
1974	98	103	93	111	99	92	92	99	103	87
1975	96	102	90	107	97	96	83	93	100	82
1976	99	100	97	103	98	98	96	101	102	90
1977	100	100	100	100	100	100	100	100	100	100
1978	102	100	104	96	100	104	107	108	99	103
1979	105	98	112	93	103	104	123	115	103	113
1980	103	98	107	92	103	101	123	114	100	96
1981	102	97	107	90	103	98	129	108	99	108
1982	99	95	103	87	103	94	118	106	99	114
1983	95	91	98	79	101	89	105	106	99	110
1984 ¹⁰	96	89	103	80	99	88	120	106	95	122

¹Includes operator and unpaid family labor, and operator-owned real estate and other capital inputs. ²Includes all inputs other than nonpur-chased inputs. ³Includes hired, operator, and unpaid family labor. ⁴Includes all land in farms, service buildings, grazing fees, and repairs on ser-vice buildings. ⁵Includes interest and depreciation on mechanical power and machinery repairs, licenses, and fuel. ⁶Includes fertilizer, lime, and pesticides. ⁷Includes nonfarm value of feed, seed, and livestock purchases. ⁸Includes real estate and personal property taxes, and interest on livestock and crop inventory. ⁹Includes such things as insurances, telephone, veterinary fees, containers, and binding materials. ¹⁰Preliminary.

5. FARM MACHINERY

Increased agricultural mechanization since the 1940's has been a major contributing factor in making U.S. farmers the most productive in the world. The transition to intensive farm machinery utilization has dramatically reduced labor requirements in U.S. agriculture, spurring the mass migration of nearly 7 million people from the farm primarily to industrial jobs following World War II.

As farmers mechanized their operations, they began to use other purchased inputs more intensively. The development of higher yielding crop varieties, commercial fertilizers and pesticides, and effective application equipment encouraged farmers to increase agrichemical use more than eightfold between 1945 and 1982.

As a consequence of the adoption of more capital intensive production practices, total annual U.S. crop production more than doubled during this period.

Many crop production activities once requiring either intensive seasonal labor or constant attention are now easier to manage as farms have become more mechanized.

Fresh fruits and vegetables are now available to consumers year round, in part because of efficient mechanical harvesting, improved storage and transportation, and increased mechanization throughout the entire market chain.

Livestock increasingly is being raised in highly efficient, confined facilities, which require less labor and enhance growers' management capabilities.

Automated feeding, watering, and milking systems have improved feed conversion rates, increased productivity, lowered unit production costs, and freed growers for other enterprises.

In the case of field crop production, farmers are adopting conservation tillage practices to lower operating costs and reduce soil erosion. New implements increasingly are encouraging farmers to shift to conservation tillage.

Such implements as ridge planters, no-till drills, and conservation cultivators loosen the subsoil without turning under the surface cover.

Today, U.S. agriculture can generally be characterized as a mature market for farm machinery where more efficient tractors and implements are purchased to replace older equipment with less capacity.

In recent years, high interest rates, record debt, and declining farm real estate values have led to a decrease in the domestic demand for machinery.

Since 1979, when farmers purchased a record \$11.75 billion

of new and used machinery, farm machinery expenditures have fallen sharply to \$5.68 billion in 1985.

In addition, total farm expenditures for other capital equipment such as trucks and automobiles fell to \$1.80 billion in 1985 from \$2 billion in 1984—a 10 percent decline.

While demanding less new and used farm machinery, farmers continue to increase their spending on repairs and services. In 1985, farmers spent roughly \$4 billion to maintain their existing farm machinery inventories, up 8 percent from 1979.

The U.S. farm machinery industry has responded to the downturn in demand by offering attractive sales incentives. It also has reduced total output to reduce shortrun operating costs and market inventories and has undertaken consolidation efforts to reduce excess productive capacity.

6. FARM EXPENSES

Farmers spent \$136.1 billion on production goods and services in 1985, about 82 cents for every dollar of gross income from farming and government payments.

Production expenses have generally increased every year over the last 30 years. For 1985, however, expenses were 4 percent lower than in 1984—the first significant annual decline since 1953. (Expenses declined by a small amount in 1983 when an unusually large number of crop acres was idled under the Payment in-Kind Program.) Table 6 shows some major expense items for selected years from the last two decades.

Table 6—Farm production expenses, 1964, 1969, 1974, 1979, 1982, 1985

[In billions of dollars]

Major items	1964	1969	1974	1979	1982	1985
Purchased feed	5.5	7.1	14.5	19.3	21.7	19.6
Purchased livestock . . .	2.4	4.2	5.1	13.0	9.7	9.0
Repair and operation . .	3.9	4.5	6.7	7.3	7.7	7.5
Capital consumption . . .	4.9	6.6	10.5	19.3	23.9	21.1
Fertilizer and lime	1.9	2.3	6.1	7.4	8.0	6.9
Short-term interest	1.0	1.4	2.9	6.9	11.3	8.8
Mortgage interest	1.0	1.6	2.8	6.2	10.5	9.9
Property taxes	1.8	2.5	3.1	3.9	4.4	4.4
Labor	3.5	4.2	6.1	9.0	10.2	10.4
Total Production Expenses	31.8	42.1	71.0	123.3	140.7	136.1

Total production expenses (not adjusted for inflation) increased by 327 percent between 1964 and 1985 and 10 percent between 1979 and 1985. Much of the long-term increase in production expenses was due to inflation, increased capital investment in agriculture, and greater purchase of services and inputs.

The index of prices paid by farmers for production items, interest, taxes, and wage rates rose 165 percent between 1964 and 1985 and 26 percent between 1979 and 1985. This index of farm input prices increased less, however, than the Consumer Price Index (CPI), which rose by 247 percent between 1964 and 1985 and by 48 percent between 1979 and 1985.

As farm operations over time have become more specialized, farmers have invested in special machinery, equipment, and buildings. Specialization has also led to greater purchases of goods and services from others. For example, many farmers buy feed rather than grow it. Suppliers may construct buildings, install fences, test soils, or lease equipment—activities that most farmers used to perform themselves.

Farmers have also increased their use of credit. Total farm related debt increased each year from 1944 to 1982. During the first part of this 40-year period, the increase was relatively steady. In the late seventies and early eighties, the increase accelerated until total debt peaked in 1982 at \$217 billion. Since the 1982 peak, total farm debt declined to \$205 billion in 1985.

Interest paid by farmers followed a pattern similar to that for total debt—steady increases since the forties and then an acceleration in the late seventies and early eighties. Interest expenses also peaked in 1982 at \$21 billion. They have since declined to \$20 billion. Some of the increase in the late seventies was due to increases in interest rates.

Expenses for major overhead items—capital consumption, taxes, and interest on farm mortgage debt—tended to rise faster than current operating expenses over most of the last decade. Overhead costs, however, have declined more quickly in the last 2 years than operating expenses.

It is unclear how long the decline in production expenses first seen in 1985 will continue. USDA forecasters predict that 1986 production expenses will be lower than 1985 levels, barring unforeseen changes in the economy.

Table 7.—Farm debts, 1940, 1950, 1960, 1970, and 1983-85

[In billions of dollars]

	Farm debt outstanding, December 31							
	1940	1950	1960	1970	1980	1983	1984	1985
Real estate debt:								
Federal land banks	2.7	1.0	2.5	7.1	36.2	48.8	49.1	44.6
Life insurance companies	1.0	1.4	3.0	5.6	12.9	12.7	12.4	11.8
Banks	0.5	1.0	1.6	3.8	8.6	9.3	10.2	11.4
Farmers Home Administration	0.1	0.3	0.7	2.4	7.7	9.5	10.0	10.4
Individuals and others	2.2	2.5	5.0	11.4	30.2	32.3	29.9	27.2
Total	6.5	6.1	12.8	30.3	95.8	112.6	111.6	105.4
Nonreal estate debt:								
Banks	1.0	2.5	5.0	11.1	31.6	39.0	39.6	35.5
Production credit associations ¹	0.2	0.5	1.5	5.3	20.5	20.8	18.8	14.5
Farmers Home Administration	0.5	0.3	0.4	0.8	11.8	14.6	15.7	17.1
Individuals and others ²	1.7	2.8	5.1	5.1	17.7	18.9	18.0	15.4
Total	3.3	6.1	12.0	22.3	81.6	92.8	92.2	82.5
Commodity Credit Corporation	0.6	0.8	1.4	1.9	5.0	10.8	8.6	16.9
Total	10.5	13.1	26.2	54.5	182.3	216.2	212.3	204.8

¹Includes loans to other financial institutions (OFL's)

²Includes Small Business Administration loans.

7. FERTILIZER

Commercial fertilizers enable farmers to maintain soil fertility, increase production, and reduce unit costs of crop production through increased yields per acre and per farmworker.

Farm consumption of primary plant nutrients—nitrogen (N), phosphate (P₂O₅), and potash (K₂O)—in the United States rose to a record 23.7 million tons in 1981, ending a 40-year expansion in fertilizer use.

After 1981, fertilizer consumption dropped 24 percent to 18.1 million tons in 1983, following a sharp drop in crop acres in that year.

In 1984, fertilizer use increased to 21.8 million tons because of a rebound in crop acres and remained close to that total in 1985.

Fertilizer application rates are beginning to level off, and consumption of plant nutrients will depend heavily upon crop acres planted.

Nitrogen is about 53 percent of total nutrient consumption, while phosphate and potash are 21 and 26 percent, respectively.

Four crops—corn, cotton, soybeans, and wheat—use about

two-thirds of the primary plant nutrients. Corn alone uses close to half the total.

Mixed fertilizer and bagged fertilizer as a proportion of total fertilizer have continued to decline. In 1985, mixed fertilizer comprised about 40 percent of total consumption, compared with 49 percent 10 years earlier.

Dry bagged fertilizer made up 22 percent of total consumption in 1975, but declined to 10 percent in 1985. The proportion of dry bulk and fluid fertilizers increased from 48 to 51 percent and 30 to 39 percent, respectively.

Farmers are using higher analysis fertilizer materials. That is, average primary nutrient content increased from 41 percent in 1975 to 44 percent in 1985. Nitrogen content increased the most from about 20 percent in 1975 to about 22 percent in 1985. Potash content was up less than 1 percentage point from 1975 to 11.2 percent, while phosphate content was down about 1 percent to about 10 percent.

8. LIVESTOCK AND POULTRY FEED

Providing feed and feeding livestock and poultry are important parts of today's agricultural industry, involving not only the farmers and ranchers but also the formula feed and grain processing industry. About 28 percent of grains fed are used on farms where grown. The rest moves through commercial channels.

In the crop year 1984-85, the livestock and poultry industries consumed 509.5 million tons of feed and roughage, 5 percent more than the 485.3 million tons fed in 1965-66. The quantity of concentrates fed increased 27 percent, while roughage consumption declined 6 percent. This change reflects both increased intensity of feeding as well as larger numbers of livestock and poultry.

The livestock and poultry fed totaled 78.5 million grain-consuming animal units (GCAU) in 1984-85, up 6 percent from 74.4 million units on hand in 1965-66. Roughage-consuming animal units (RCAU) declined 4 percent from 88.9 million units to 85.9 million.

Some significant shifts occurred in the composition of the grain- and roughage-consuming animal units between 1965 and 1985. Poultry accounted for 26 percent of the GCAU's in 1984-85, compared with 22 percent of the total in 1965-66.

The major shift in the composition of RCAU's has been a decline in the number of dairy cows and heifers and an increase in beef cattle and horses.

Pasture forage accounted for 44 percent of the total tonnage

of feed used in 1984-85. This highlights the importance of the livestock industry in efficient use of land. Most of the area pastured is land that cannot be cropped. However, livestock enables this land to make a significant contribution to the food supply of the United States.

Technology for production of livestock and poultry has advanced tremendously, particularly in the last 20 years. This includes many innovations in feed formulation and handling.

Progress in feed technology has been possible through developments in nutritional knowledge and genetic improvement in both livestock and poultry. Research also has improved methods of housing livestock, and the bulk formulation, mixing, transporting, and distribution of feeds.

One result has been to reduce labor needed on farms. This has been associated with the development of very large poultry and livestock feeding enterprises.

Increasing quantities of poultry and livestock are coming from large enterprises built to a great extent around feed manufacturing. Most of these enterprises have a feed mill at or near the feeding location. Some feed their own livestock, but many others also feed livestock belonging to other firms or individuals. Many mills have custom grinding and mixing services and prepare feeds according to specifications of feed purchasers.

Table 8.—Kinds and quantities of feed consumed by livestock and poultry, feeding years 1965-66 and 1984-85¹

Feed materials	1965-66 feeding year (million tons)	Per- cent of total	1984-85 feeding year (million tons)	Per- cent of total
Grains:				
Corn	81.5	16	115.2	22.6
Other feedgrains	32.1	7	40.0	7.9
Wheat and rye	3.0	1	13.7	2.7
Protein feeds	31.7	6	28.7	5.6
Byproduct feeds	11.5	3	13.3	2.6
Total concentrates	160.4	33	203.8	40.0
Hay	49.4	10	59.6	11.7
Other harvested roughages ..	26.3	5	20.0	3.9
Pasture	249.1	52	226.1	44.4
Total roughage	324.8	67	305.7	60.0
Total, all feeds	485.3	100	509.5	100.0

¹Measured in feed units (corn equivalents).

9. AGRICULTURAL CREDIT

The use of credit has played a major part in the growth of agricultural productivity. Farmers have expanded their use of credit rapidly in the last quarter of a century to finance purchases of land, equipment, and livestock; to cover operating expenses; and to increase the size of their farms.

Total farm debt (including Commodity Credit Corporation loans) at the beginning of 1986 was \$192 billion, nearly four times the 1970 level but down from the peak of \$216.3 billion in 1983.

Rising agricultural land values throughout the 1970's allowed farmers to substantially increase their use of farm real estate loans, which are secured by a lien or mortgage on farmland or real property. However, declining average farmland values during 1981-82, together with relatively low net farm income, left some farmers in financial distress. While ample credit is available from commercial lenders, qualifying for such credit has become increasingly difficult.

Real estate loans ordinarily are used to purchase farmland or make major capital improvements to farm property. They may also be used to refinance existing debts and particularly to consolidate short-term debts.

Farm real estate debt totaled \$97.5 billion on December 1, 1986. Institutional lenders, such as Federal land banks of the cooperative Farm Credit System, life insurance companies, commercial banks, and the Farmers Home Administration (Federal Government lender in USDA) hold nearly three-quarters of the farm real estate loans. Individuals and other unclassified lenders hold the remainder.

Many of the individuals supplying farm credit are the sellers of farmland. That is one method of transferring farm property and can be advantageous to both the buyer and the seller. The down payment is often less and the interest rate on the balance is usually lower than with regular institutional lenders. The seller collects the sales price of the land plus the interest over a period of years, which provides an investment and a prolonged income.

Sellers supplied 26 percent of funds for farmland purchases in 1985, down from 40 percent in 1981. During this period, the Federal land banks have become the most important supplier, furnishing 42 percent in 1985.

Farm loans (excluding Commodity Credit Corporation loans) not secured by farmland amounted to \$77.6 billion at the end of 1985. These funds are used for operating and living expenses; to buy equipment, motor vehicles, and livestock; to make minor

improvements to farm property; and for many other purposes.

Institutional lenders such as commercial banks, production credit associations of the cooperative Farm Credit System, and the Farmers Home Administration hold about 81 percent of such loans. Merchants, dealers, individuals, and other lenders hold the other 19 percent.

The Farm Credit Administration (FCA) is an independent Government agency that supervises the cooperative Farm Credit System, which obtains its loan funds by selling securities to investors. The Farm Credit System is completely owned and controlled by its users—farmers and their cooperatives.

The net worth of the system is now more than \$11.8 billion. The system is made up of 12 Federal land banks and 471 local Federal land bank associations; 12 Federal intermediate credit banks and 415 local production credit associations; and 13 banks for cooperatives from which farmers' marketing, purchasing, and business service cooperatives obtain loans.

The Farm Credit System provides about one-third of the credit used by farmers and about two-thirds of the credit used by their cooperatives.

Owner-members now borrow more than \$62.1 billion a year from the cooperative Farm Credit System. They currently are using more than \$81.1 billion for credit in outstanding loans from the System.

The FCA operates under a 13-member, part-time policymaking Federal Farm Credit Board. Twelve members of the board are appointed for 6-year staggered terms by the President of the United States. The 13th member is appointed by and serves as the representative of the Secretary of Agriculture.

The *Farmers Home Administration* (FmHA), a USDA agency, makes loans and grants to farmers and other rural residents who cannot get credit elsewhere for farming, housing, and rural development purposes. The agency was created to help farmers by making higher risk loans than those that are considered justifiable by other lending agencies. Farm loans continue to occupy a key role in the agency's authorities. In these loans and in housing loans to individuals, borrowers are expected to refinance their FmHA loans with a private lender when able to do so.

Farm ownership loans are designed to help farmers buy farms or land or enlarge farms; construct or repair buildings; improve land; develop, conserve, and make proper use of their land and water resources.

The maximum farm ownership loan may not exceed \$200,000, although FmHA will guarantee loans as high as \$300,000 from other credit sources. The interest rate for direct loans from

FmHA is based on the rate for current Government borrowing. The repayment term can be up to 40 years. The interest rates and repayment terms for guaranteed loans are negotiated between borrowers and lenders, within FmHA guidelines.

Operating loans are extended primarily to help farmers purchase equipment, livestock, feed, seed, and fertilizer; for other farm and home operating needs; to refinance chattel debts; and to carry out forestry and aquaculture projects.

Farm operating loans made by FmHA may not exceed \$200,000; but, again, the agency can guarantee loans to farmers from other credit sources as high as \$400,000. Loans are to be repaid over a period not exceeding 7 years, but extensions are sometimes granted. Interest rates are based on the rate for current Government borrowing.

Youth project loans are made to rural young people between the ages of 10 and 20 years to finance income-producing farm or nonfarm enterprises that are carried out under an organized and supervised program, such as Future Farmers of America.

Reduced interest rates for ownership and operating loans can be made to beginning and other limited-resource farmers for the first 3 years of the loan, if they cannot afford to pay the full cost-of-money rates.

Emergency loans are available to eligible farmers and ranchers who have suffered qualifying losses from natural disasters in areas that are named by the President, the Secretary of Agriculture, or the FmHA Administrator as emergency disaster areas. Loans are made to those unable to obtain credit from other sources at 5 percent interest up to \$100,000 and at 8 percent above \$100,000 to cover up to 80 percent of actual losses. Emergency loans cannot exceed \$500,000.

In housing, interest rates are determined by rates for current Government borrowing, except that low-income households may qualify for rates as low as 1 percent. Loan programs include the following:

- (1) Home ownership loans to purchase, refinance, or improve existing residences; build new houses; and acquire building sites. Maximum term is 33 years.

- (2) Rural rental housing loans to provide rental housing for persons with low or moderate income and for persons age 62 or over. These loans can be coupled with rental assistance payments to reduce rents paid by low-income tenants to no more than 25 percent of their income. Maximum repayment period is 50 years.

- (3) Rural housing repair loans or grants to senior citizens with very low income and loans to low-income persons to make repairs and to remove health and safety hazards. Maximum

grant is \$5,000 and maximum loan or loan and grant combination is \$7,500. Maximum loan term is 20 years.

(4) Farm labor housing loans to finance low-rent housing for domestic farm laborers. Interest rate is 1 percent and maximum term is 33 years. Grants not exceeding 90 percent of development cost of farm labor housing projects are available under some conditions.

(5) Loans for development of rural homesite areas.

(6) Self-help site development loans and grants to nonprofit organizations providing technical assistance to low-income families building homes by the self-help method.

Loans are made for irrigation, drainage, other soil and water conservation facilities, and for grazing associations. Loans are amortized up to 40 years at an interest rate based on the rate for current Government borrowing.

Financial assistance is available for community facilities, for public use in rural areas and towns of up to 20,000 population, and for water and waste disposal systems in towns of up to 10,000 population. Maximum loan term is 40 years, and the interest rate is based on current market yields of municipal obligations. Development grants may be made to pay up to 75 percent of the cost of constructing water and sewer systems.

Loans are made to Indian tribes to acquire land within a reservation or Alaskan community for tribal use. These loans are repayable in 40 years.

Resource conservation and development loans are made in designated areas. These loans cannot exceed \$500,000 and are amortized up to 30 years.

Watershed loans are made to finance the local share of costs in projects approved under the Watershed and Flood Prevention Act or in connection with the 11 watershed improvement programs authorized by the Flood Control Act of 1944. They cannot exceed \$10 million and are amortized up to 50 years.

The interest rate on these loans is determined by the Secretary of the Treasury at the beginning of the fiscal year.

Business and industrial loans are made to individuals, public and private organizations, and federally recognized Indian tribal groups for furthering business and industrial development in rural areas. Loans can be made for projects in the open countryside or in towns of up to 50,000 population. Preference is given to towns with less than 25,000 people.

FmHA assistance is provided in the form of guarantees that assure reimbursement to the lender of up to 90 percent of principal and interest. Terms of the loans, including repayment period and interest rates, are determined between borrower and lender, within FmHA guidelines.

USDA's Rural Electrification Administration (REA) assists rural electric and telephone organizations in obtaining the financing required to provide electric and telephone service in rural areas.

Financing may include a loan from REA, REA guarantee of a loan made by others, or REA approval of security arrangements that permit a borrower to obtain financing from other lenders without a guarantee.

REA was established by Executive Order in May 1935 as part of a general program of unemployment relief. Statutory authority was provided by the Rural Electrification Act of 1936, establishing REA as a lending agency with responsibility for developing a program for rural electrification. An October 1949 amendment to the law authorized REA to make loans to extend and improve telephone service in rural areas.

In May 1971, another amendment authorized the establishment of a Rural Telephone Bank (RTB) to provide supplemental financing from non-Federal sources for telephone systems. The Bank is an agency of the United States in the U.S. Department of Agriculture. Its management is vested in a Governor (the REA Administrator) and Board of Directors, some of whom are elected from among the Bank's borrowers.

Bank loans are made for the same purposes for which REA loans are made and bear interest at the Bank's cost-of-money rate as determined by the Governor.

In May 1973 an amendment established The Rural Electrification and Telephone Revolving Fund in the U.S. Treasury as the source of REA funds for loans and loan guarantees. By law, most REA loans are made at 5 percent interest, although some are available at 2 percent under special conditions.

The revolving fund is replenished through collections on outstanding REA loans and from REA's sale of certificates of beneficial ownership to the Federal Financing Bank. Certificates are secured by borrowers' notes, and their repayment is insured by REA. Limitations on the amount authorized for loans in any one year may be imposed by Congress.

The REA loan guarantee program went into operation in February 1974. Loans guaranteed by REA may be obtained from the Federal Financing Bank or any legally organized lending agency qualified to make, hold, and service a guaranteed loan. Guaranteed loans bear interest at a rate agreed upon by the borrower and the lender.

As of October 1, 1986, REA's electric program had loaned or guaranteed more than \$60 billion to about 1,100 electric systems that extended more than 2 million miles of electric distribution lines to nearly 12 million rural consumers.

REA's telephone program had loaned or guaranteed \$7.5

billion to about 1,000 telephone companies that extended more than 900,000 miles of telephone lines to 5.4 million rural families and businesses.

10. THE BALANCE SHEET

Farm asset values including farm households totaled \$866.8 billion on January 1, 1985, a decrease of 9 percent from the preceding year. Farm debt outstanding decreased in 1985 by 3 percent, reaching \$204.9 billion on December 31, 1985. This was the third year that loans outstanding decreased.

Decreases in assets and debts in 1985 resulted in a 11 percent decline in equity during 1985. This decline in farm equity reflected the difficult cash flow position of some farmers, high interest rates, and low returns. On the average, farm equity decreased \$37,100 to \$289,699 per farm on December 31, 1985.

The debt-to-asset ratio increased during 1985, rising from 22.2 to 23.6 percent during 1985. This is the highest the ratio has been since the balance sheet was begun in 1939. During the 1970's, the debt-to-asset ratio was 16 to 17 percent.

The value of farm real estate, which accounts for 70 percent of farm assets, declined 12 percent during 1985. The per acre value declined from \$679 on April 1, 1985, to \$548 on February 1, 1987. On February 1, 1987, the average farm real estate value per form was \$248,843. On April 1, 1982, it was \$352,000.

Livestock and poultry asset values fell by 7 percent during 1985, while machinery and equipment values fell by nearly 2 percent.

Many farmers remain reluctant to buy farm machinery. Their reluctance stems from high interest rates, low returns to farm asset investments, and the high level of indebtedness that many farmers are carrying, which causes cash flow difficulties and reduces the willingness of lenders to loan more funds to farmers.

The value of household equipment and furnishings remained constant between December 31, 1984, and December 31, 1985. The greatest increase in value occurred in crops stored on and off farms, followed by increases in deposits and currency and in savings bonds.

Farmers' net worth in cooperatives decreased nearly 7 percent, due partly to the losses from bad loans that many cooperative organizations have experienced since 1984.

Farm real estate debt, which comprises half of the total debt outstanding, decreased by nearly 6 percent in 1985 to total \$105.4 billion on December 31, 1985. Commercial banks had the largest increase, 12 percent in their loans outstanding, while

farm real estate debt held by Federal land banks decreased by 9 percent.

Nonreal estate farm debt outstanding decreased 1 percent to total \$99 billion on December 31, 1985. Federal intermediate credit banks had the largest decrease, 39 percent. The Commodity Credit Corporation (CCC) and the Farmers Home Administration (FmHA) are the only nonreal estate lenders that had increases in their outstanding nonreal estate loans.

Table 9.—Farmers' assets, debts, and equity, 1940, 1950, 1960, 1970, 1980, and 1985¹

[In billions of dollars]

Item	1940	1950	1960	1970	1980	1985
Assets:						
Real estate	34.4	89.5	138.5	223.2	846.6	607.5
Physical assets other than real estate	15.6	48.7	54.5	78.8	219.0	206.6
Financial	4.7	16.0	17.8	24.0	42.8	52.7
Total	54.8	154.3	210.9	326.0	1,108.3	866.8
Debts:						
Real estate	6.5	6.1	12.8	30.3	95.8	105.4
Nonreal estate	3.3	6.1	12.0	22.3	81.6	82.6
CCC	0.6	0.8	1.4	1.9	5.0	16.9
Total	10.5	13.1	26.2	54.5	182.3	204.9
Equity	44.3	141.3	184.7	271.5	926.0	661.9

¹As of December 31, Includes farm households.

11. FARM INCOME

U.S. farmers earned a total of \$71.3 billion in income from farm and off-farm sources in 1985. Their farming operations netted \$30.5 billion (after adjusting for changes in commodity inventories) for their labor, capital, and management. This was an increase of 143 percent from 1983, when income was reduced by the drought and farm program terms. Income from off-farm sources totaled \$40.8 billion in 1985, compared with \$37.0 billion in 1983.

Farm operators have earned more than 60 percent of their income from off-farm sources during the last several years. Nearly all farm operator families had some off-farm income, but the smaller the farm, the higher the proportion of off-farm income. Those on farms selling less than \$20,000 in farm

products per year had negative farm incomes on the average. Thus, the total family income came from off-farm sources.

The largest farm firms, those selling \$500,000 or more in farm products per year, averaged less than 5 percent of total income from off-farm sources.

Gross income from farming in 1985 was \$166.6 billion, up slightly from the preceding 4 years' average. Despite the 4-percent decline in production expenses (to \$136.1 billion), 1985 net income from farming decreased by roughly 7 percent to \$30.5 billion.

The gross cash income for 1985 held steady, largely due to the stability of cash receipts. Direct Government payments fell from \$18.4 billion in 1984 to \$7.7 billion in 1985. Inventories were up about \$17.7 billion from a record negative \$9.8 billion change in 1983 to a record positive \$7.9 billion in 1984.

The volume of farm products marketed in 1985 again rose from the drought and PIK-reduced crop marketings of 1983 because of strong output of feed grains, oilcrops, and cotton. Prices farmers received for their products averaged 10 percent lower in 1985 than a year earlier. Prices for livestock and livestock products averaged 7 percent lower, while crop prices fell about 14 percent.

Receipts from marketings of livestock and products were down \$2.5 billion, and crop sales were \$2.5 billion higher than in 1984, with the combined total of \$142.1 billion. Ranked on the basis of total cash receipts from farm marketings in 1984, California was first with \$14.2 billion, Texas second with \$9.7 billion, and Iowa third with \$9.3 billion.

The other 7 States in the top 10 (by order of cash receipts from marketings) were Nebraska, Illinois, Minnesota, Kansas, Wisconsin, Florida, and North Carolina.

In 1984, the top 10 States accounted for 51 percent of total cash receipts from farm marketings, with the top 5 States accounting for over one-third. Compared with the top 10 States, all of which had over \$4.1 billion in marketing receipts, Rhode Island had only about \$62 million in marketing receipts and Alaska about \$25 million.

The components used in calculating net income from farming after inventory adjustment for 1981 are shown in the following tabulation:

Cash and other income from farming, 1985

(In billions of dollars, rounded)

Cash receipts from farm marketings	142.1
Government payments to farmers	7.7
Farm related income	6.4
	<hr/>
Gross cash income	156.2
Cash production expenses	112.1
	<hr/>
Net cash income	44.0
	<hr/>
Nonmoney income	11.5
Value of inventory change	-1.1
	<hr/>
Gross income	166.6
Total farm expenses	136.1
	<hr/>
Net farm income after inventory adjustment	30.5

Source: Economic Research Service, USDA

The components used in calculating net income from farming after inventory adjustment for 1981 are shown in the following listing:

Gross farm income includes five principal components:

1. *Cash receipts from farm marketings* of farm products represent gross receipts from commercial market sales, as well as loans (net of redemptions) made or guaranteed by CCC and purchases under price-support programs.

2. *Government payments to farmers* are those made directly to farmers in connection with farm programs.

3. *Farm-related income* derives from recreation and machine hire and customwork, forest product sales, and miscellaneous sources.

4. *Nonmoney income* includes the value of farm products consumed directly in farm households and housing provided by farm dwellings. Expenses associated with these products and the dwellings are included in the production expense estimates.

5. *Value of inventory change* is the change in quantity from beginning to ending of year multiplied by the calendar year average price for each commodity.

Farm production expenses summarize the total costs incurred in farm production. They include current farm operating expenses for such items as wages paid to hired labor (in cash and in kind) and outlays for repairs of equipment and operation

of the farm, as well as purchases of oil, feed, seed, and livestock.

Overhead costs include charges for depreciation and other capital consumption, taxes on farm property, and interest on the farm mortgage debt.

Expenditures on new buildings, motor vehicles, and other capital equipment are not included as a production cost. Instead, production expenses include an allowance for annual depreciation and other capital consumption. Estimates of depreciation are based on replacement cost, which is the amount necessary at current prices to replace buildings and equipment used during the year.

Thus, after a period of substantial price increase, as occurred after World War II, the current replacement cost basis results in larger depreciation charges than would estimates on an original cost basis.

Farm operators' net income after inventory adjustment is gross income, after inventory change, less production expenses. After adjustments for corporate officers' salaries and corporate profits, it is the figure included in the national income estimates by the U.S. Department of Commerce as farm proprietors' income.

Net farm income measures the income generated from the production of a given calendar year. It is an approximation for the net value of agricultural production, regardless of whether the commodities were sold, fed, or placed in inventory during the year. Unlike net cash income, this series includes farm household benefits and expenses.

Farm wages of laborers on farms represents the income received by farm laborers living on farms from wages paid by farm operators.

Net cash income from farming measures the total income that farmers choose to receive in a given calendar year, regardless of the amount of production or the year the marketed output was produced. It approximates the income available to farmers for purchasing assets, such as land or machinery; retiring loans; and paying off all other expenditures, including those for operating the farm household. It is the difference between the gross cash income received (cash receipts, Government payments, and other farm income) less the cash expenses incurred during a calendar year.

USDA has been publishing a comprehensive set of income estimates relating to agriculture since the mid-1920's.

Economists develop data on gross farm income, farm production expenses, and the net return to farm operators for their farm work, including that of their families; for their management; and for the capital invested in their farms and equipment.

Net return is measured as net farm income after inventory adjustment as noted in earlier paragraphs. It can also be measured on a cash basis as net cash income.

The cash receipt estimates are on a commodity-by-commodity basis, the result of the use of detailed monthly price and marketing estimates by State as provided by the National Agricultural Statistics Service (NASS). The expense estimates are by type of expense account; for the most part they are based on census of agriculture benchmarks, with yearly movements derived from special surveys and NASS estimates of prices paid by farmers.

Table 10.—Average net farm income before inventory adjustment (including operator households) and off-farm income, 1980-85

Year	Net farm income	Off-farm income	Total
	- - - - Dollars per farm - - - -		
1980	9,223	14,263	23,486
1981	8,378	14,709	23,087
1982	9,997	15,175	25,172
1983	10,074	15,619	25,693
1984	11,345	16,265	27,610
1985	13,881	17,945	31,826

II. THE FARMING OPERATION

12. FARMING REGIONS

The 10 major farming regions in the United States differ in soils, slope of land, climate, distance to market, and in storage and marketing facilities. Together they comprise the agricultural face of the Nation.

The Northeastern States—from Maine to Maryland—and the Lake States—the northern tier of States bordering on the Great Lakes from Michigan to Minnesota—are the Nation's principal milk-producing areas.

Climate and soil in these States are suited to raising grains and forage for cattle and for providing pastureland for grazing.

Broiler farming is important in Maine, Delaware, and Maryland. Fruits and vegetables are important to the region.

The Appalachian region—Virginia, West Virginia, North Carolina, Kentucky, and Tennessee—is the major tobacco-producing region in the Nation. Peanuts, cattle, and dairy production are also important.

Farther south along the Atlantic is the Southeast region. Beef and broilers are important livestock products. Fruits, vegetables, and peanuts are grown in this area. And, of course, there are the big citrus groves and winter vegetable production in Florida.

In the Delta States—Mississippi, Louisiana, and Arkansas—the principal cash crops are soybeans and cotton. Rice and sugarcane are also grown. With improved pastures, livestock production has gained in importance. This is a major broiler-producing region.

The Corn Belt, extending from Ohio through Iowa, has rich soil, good climate, and sufficient rainfall for excellent farming. Corn, beef cattle, hogs, and dairy products are the major outputs of farms in the region. Other feed grains, soybeans, and wheat are also important.

Agriculture in the northern and southern Plains, which extend north and south from Canada to Mexico and from the Corn Belt into the Mountain States, is restricted by rainfall in the western portion and in the northern part by cold winters and short growing seasons.

About three-fifths of the Nation's winter and spring wheat is produced in the region. Other small grains, grain sorghum, hay, forage crops, and pastures form the basis for cattle. Cotton is produced in the southern part.

The Mountain States—from Idaho and Montana to New Mexico and Arizona—provide a still different terrain. Vast areas of this region are suited to raising cattle and sheep. Wheat is

important in the northern parts. Irrigation in the valleys provides water for such crops as hay, sugar beets, potatoes, fruits, and vegetables.

The Pacific region includes the three Pacific Coast States plus Alaska and Hawaii. Farmers in the northern mainland area specialize in raising wheat, fruit, and potatoes; vegetables and fruit and cotton are important in the southern part. Cattle are raised throughout the entire region. And in Hawaii, sugarcane and pineapples are the major crops.

Table 11.—Cash receipts from farm marketings, all States, 1985

(In millions of dollars)

State	Total	Livestock and livestock products	Crops	The five leading commodities ranked by cash receipts				
				1.	2.	3.	4.	5.
Alabama	2,077	1,301	776	Broilers	Cattle, Calves	Eggs	Cotton	Soybeans
Alaska	26	8	18	Grnhse, Nursery	Dairy Products	Potatoes	Hay	Eggs
Arizona	1,529	702	827	Cattle, Calves	Cotton	Dairy Product	Lettuce	Eggs
Arkansas	3,280	1,825	1,455	Broilers	Soybeans	Rice	Cattle, Calves	Eggs
California	13,970	4,165	9,805	Dairy Product	Grnhse, Nursery	Cattle, Calves	Cotton	Grapes
Colorado	3,164	2,019	1,145	Cattle, Calves	Wheat	Corn	Dairy Products	Hay
Connecticut	316	206	110	Eggs	Dairy Products	Grnhse, Nursery	Tobacco	Cattle, Calves
Delaware	490	352	137	Broilers	Corn	Soybeans	Dairy Products	Potatoes
Florida	4,741	1,015	3,726	Oranges	Grnhse, Nursery	Tomatoes	Sugar Cane	Dairy Products
Georgia	3,327	1,727	1,600	Broilers	Peanuts	Eggs	Cattle, Calves	Hogs
Hawaii	540	83	458	Sugar Cane	Pineapples	Grnhse, Nursery	Dairy Products	Cattle, Calves
Idaho	2,063	862	1,200	Cattle, Calves	Potatoes	Dairy Products	Wheat	Barley
Illinois	7,768	2,063	5,704	Corn	Soybeans	Hogs	Cattle, Calves	Dairy Products
Indiana	4,597	1,728	2,869	Corn	Soybeans	Hogs	Cattle, Calves	Dairy Products
Iowa	9,201	4,811	4,390	Corn	Hogs	Cattle, Calves	Soybeans	Dairy Products
Kansas	5,741	3,264	2,478	Cattle, Calves	Wheat	Sorghum grain	Hogs	Corn
Kentucky	2,871	1,352	1,519	Tobacco	Horses, Mules	Cattle, Calves	Corn	Dairy Products
Louisiana	1,460	491	968	Soybeans	Cotton	Cattle, Calves	Rice	Broilers
Maine	378	250	127	Dairy Products	Eggs	Potatoes	Broilers	Cattle, Calves
Maryland	1,148	770	278	Broilers	Dairy Products	Corn	Cattle, Calves	Soybeans
Massachusetts	389	124	265	Grnhse, Nursery	Cranberries	Dairy Products	Eggs	Apples
Michigan	2,850	1,231	1,619	Dairy Products	Corn	Cattle, Calves	Soybeans	Grnhse, Nursery
Minnesota	6,472	3,370	3,102	Dairy Products	Corn	Cattle, Calves	Soybeans	Hogs
Mississippi	2,136	1,010	1,126	Cotton	Broilers	Soybeans	Cattle, Calves	Dairy Products
Missouri	3,668	1,930	1,738	Soybeans	Cattle, Calves	Hogs	Corn	Dairy Products
Montana	1,207	802	405	Cattle, Calves	Wheat	Barley	Hay	Dairy Products

13. FARMS AND LAND IN FARMS

The United States had 2,214,420 farms in 1986, down 3 percent from the 2.28 million in 1985 and 9 percent from the 2.43 million in 1981. The number of farms declined from 1 to 2 percent per year from 1981 through 1985. This decline continues the downward trend started in 1936.

Table 12.—Number of farms and land in farms, United States, June 1, 1981-86

Year	Number of farms	Acres of land in farms	Average size of farms
	Thousands	Thousands	Acres
1981	2,434	1,034,190	425
1982	2,401	1,027,795	428
1983	2,370	1,024,195	432
1984	2,328	1,019,378	438
1985	2,275	1,014,383	446
1986 ¹	2,214	1,007,363	455

¹Preliminary.

Land in farms continues to decline slowly, with the total of 1,007 million acres in 1986, down 0.7 of one percent from a year earlier and down 2.6 percent from 1981. Land in farms has declined every year since reaching its peak at 1,206 million acres in 1954. Some of the loss results from urbanization and highway construction.

Since the number of farms declined at a faster rate than land in farms, the average size of farms increased from 425 acres in 1981 to 455 acres in 1986.

Table 13.—Percent of farms, land in farms, and average size, by economic class, United States, June 1, 1985-86

Economic Class Gross Value of Sales	Percent of Total				Average Size of Farms			
	Farms		Land		1985		1986	
	1985	1986	1985	1986				
	Percent				Acres			
\$ 1,000-\$ 2,499	25.1	26.2	3.8	4.0	67	70		
\$ 2,500-\$ 4,999	14.3	13.9	3.6	3.3	112	108		
\$ 5,000-\$ 9,999	11.8	12.0	4.6	4.7	176	178		
\$ 10,000-\$ 19,999	10.7	10.7	6.8	7.2	283	306		
\$ 20,000-\$ 39,999	10.1	10.1	9.4	10.9	417	491		
\$ 40,000-\$ 99,999	14.2	13.3	24.3	20.4	760	698		
\$100,000-\$249,999	9.7	9.5	25.5	25.8	1,172	1,235		
\$250,000	4.1	4.3	22.0	23.7	2,419	2,507		
Total	100.0	100.0	100.0	100.0	446	455		

14. FARMS BY SALES CLASSES

More than nine-tenths of all farm products going to market are produced on farms with gross sales of \$20,000 or more per year. This upper income group of 937,000 farms as of 1984 makes up most of the commercial agricultural economy of the United States. The operators of these farms do the buying and selling that turn the wheels of an enormous agricultural business and food and fiber marketing complex.

Farms selling \$100,000 or more represented about 14.5 percent of total farm numbers in 1984. Their net income before inventory adjustment averaged \$79,600. In the aggregate they received over 100 percent of the net income from farming. The proportion of these larger farms has changed little in recent years.

Farms selling \$40,000 to \$99,999 worth of agricultural products in 1984—15.2 percent of all farms—received 8.0 percent of net farm income. The proportion of farms with annual sales between \$40,000 and \$100,000 declined in 1986 from 1985.

Farms with sales of \$20,000 to \$39,999 made up 10.6 percent of all farms and had average net farm incomes of \$392 in 1984.

These top sales classes accounted for \$155.6 billion in cash receipts (including direct Government payments) of the \$153.3 billion for all farms in 1984. The top sales groups comprised 40.3 percent of all farms and accounted for 94.3 percent of the cash receipts and over 100 percent of net farm income.

The number of such farms has almost tripled from 1960 to 1984.

Meanwhile, farms grossing less than \$20,000 in yearly sales declined by over 60 percent during the same 1960-84 period.

More recently, the proportion of farms in the \$10,000 to \$39,999 range remained stable, although the percentage of small farms, those with sales less than \$10,000, increased. The small farms still account for only 12 percent of total land in farms. In contrast, the farms with sales over \$100,000 account for nearly half of the total farm land.

The average size of small farms showed little change in 1986. Farms with sales from \$10,000 to \$39,999 increased in size, while those with sales between \$40,000 and \$100,000 declined in size. Farms with sales greater than \$100,000, on the average, were larger in size.

15. FAMILY-CONTROLLED FARMING

A family-controlled farm business is much like any other business in which an individual or several members of a family own a part or all of the assets and make most of the business decisions. Unlike the business organizations in which management is hired by stockholders, farm businesses are predominantly closely held; ownership and management are not separated.

Family businesses, whether engaged in farming or some other business activity, can be organized in three different ways. The most common is the sole proprietorship. In this form of business organization, an individual or a married couple is responsible for operating the business.

Of all farms reported in the 1982 Census of Agriculture, 87 percent were sole proprietorships.

The partnership is the next most important form of business organization for farm businesses. About 10 percent of the farms were such businesses. Typically, partnerships include a parent and one or more children or other close relatives.

Each member of the partnership shares in earnings or losses in proportion to his or her contribution. Farm businesses organized as partnerships tend to be larger than sole proprietorships because the resources of several individuals can be combined, and additional labor and management are provided by the partners.

The third form of business organization is the corporation, which has a legal identity apart from its shareholders. Any business can be incorporated under the laws of the State in which the organizers choose to file articles of incorporation.

Because it is a separate legal "person," it can conduct business in the name of the firm, provide limited liability to its stockholders, and continue to exist even though one or more share-

holders may die. Shares in the business may be transferred by sale or gift, and a different set of tax laws applies than the laws for sole proprietorships and partnerships.

According to the 1982 Census of Agriculture, there were 59,788 farms operated by corporations. These accounted for about 3 percent of all farms.

Most farming corporations reported in the census (52,657) were family held, meaning that the majority of stock is held by members of a single family or close relatives.

The remainder (7,131) of corporate farms were nonfamily corporations. The stock of most of these nonfamily corporate farms is closely held by small groups of nonrelated persons, but the stock of some of them is widely held and traded on the over-the-counter market or on organized stock exchanges. A few of the nonfamily corporate farms are owned by nonfarm corporations. Sales of these nonfamily corporate farms came mostly from fed cattle, poultry, and fruits and vegetables.

16. LAND TENURE

Land tenure describes the relationship of the farm operator to the land operated. The major land tenure categories in this country are (1) full owners—those who own all of the land they operate; (2) part owners—those who own and rent land they operate; and (3) tenants—those who rent all of the land they operate.

The Census of Agriculture reports that in 1982 approximately 2,241,000 farmers worked about 986.8 million acres of land in farms. Full owners (55.1 percent of all farm operators) operated 342.6 million acres.

Part owners (29.3 percent of all farm operators) worked 528.9 million acres.

Tenant operators (11.6 percent of all farm operators) operated about 113.3 million acres.

The number of farm operators has been declining since it peaked at 6,812,000 in 1935. This trend is continuing, but the decline in recent years does not appear to be as precipitous as in earlier years. Part owners are becoming more important as a tenure class as measured by an increasing proportion of the number of farms, acres in farms, and value of products sold. Despite considerable decline in the number of farms and shifting proportions among the tenure classes, farm operators as a whole own about three-fifths and rent about two-fifths of the land they handle.

Rental agreements vary widely, but two types are readily identified: cash and share leases. Under cash leasing, the most

common variation is for a fixed cash payment from the tenant to the landowner for the use of the land. Typically, most farming decisions are then made by the tenant.

Share leases, which may involve crops, livestock, or both, are more numerous than cash leases, and like cash leases, may be quite flexible.

Tenants combine their assets (labor and capital) with the landowners' assets (land and capital) to produce a product that is shared to compensate for the contribution each makes. The share each receives varies considerably, based on the product grown, quality of the respective assets, local custom, and so on. Variable costs of production often are shared in the same proportion as output.

Under crop-share arrangements, the landowner typically pays for one-third or one-half of the seed, fertilizer, and certain other production expenses, and receives a corresponding share of the crops. The landowner also pays the real estate taxes, maintains buildings, and pays for permanent improvements to the land. The renter may also pay cash rent for hay or pastureland, or for the use of buildings, in addition to a share of the crops.

Under cash rental, the renter pays a fixed dollar amount per acre or for the entire tract of farm, pays for all operating expenses, and keeps all the crops and livestock he or she produces. The landowner pays the real estate taxes and keeps up the buildings.

Under the livestock-share rental arrangements, the landowner and tenant jointly own certain classes of livestock and the machinery that is directly associated with the livestock enterprise, and share operating expenses and net income, most frequently on a 50-50 basis.

17. FARMLAND OWNERSHIP

The 1982 Census of Agriculture reported that of the 2,240,976 farm operators, 1,982,022 owned 603.3 million of the 986.8 million acres of land in farms.

Of the 383.5 million acres of rented land in farms, 13 percent was owned by farm operators, and 87 percent was owned by nonoperator owners. Thus nonfarmers hold about 34 percent of all land in farms.

Results of another survey of landowners in 1978 indicate that over 80 percent of the farmland was owned by sole proprietors, husbands and wives, or family partnerships. About 10 percent was held by corporations, and half of that by family corporations with 10 or fewer members.

Persons identifying themselves as farmers owned 57 percent

of the noncorporate farmland; retired people, 17 percent; white collar workers, 14 percent; and blue collar workers, 8 percent.

Farmland ownership was concentrated in the hands of older people. About 30 percent was held by persons over 65, and only 6 percent by persons under 35. Owners of over 10 percent of the acreage were over 75.

Farmland owners were overwhelmingly male. Owners of 85 percent of the noncorporate land were identified as male. However, this does not fully recognize female participation in ownership through husband-wife holdings and family partnerships.

About 94 percent of owners holding 98 percent of noncorporate farmland identified themselves as white and non-Hispanic. Blacks and Hispanics each held less than 1 percent of the farmland, with other minority groups holding even smaller proportions.

Level of formal education was not a major factor in farmland ownership. The proportion of land held by people with a grade school education was the same as that held by college graduates—20 percent each. About one-third of the land was held by people with high school educations.

Owners of over three-quarters of all farmland lived or had corporate headquarters in the same county as the land owned. Only 6 percent was held by out-of-State residents.

Ownership of farmland is concentrated. The largest 1 percent of owners hold nearly 30 percent of the acreage. Concentration does not appear to have increased significantly since the 1946 nationwide farm ownership survey.

Foreign persons, including corporations, partnerships, and other legal entities, are required under the Agricultural Foreign Investment Disclosure Act to report their holdings of U.S. agricultural land.

Summarization of the report under the act confirms that at the end of 1985, slightly less than 1 percent of the farmland was owned by foreigners. Forest land accounts for 51 percent of this foreign-owned acreage. Although some local areas may be noticeably affected by foreign ownership, the total quantity is so small nationally that the aggregate effect is insignificant.

18. CONTRACT FARMING AND VERTICAL INTEGRATION

A contract to produce and deliver a farm commodity is basically similar to the contractual arrangements that are widely used in industry.

One firm—in this case, a farmer—agrees to plant, care for, and deliver the production from a given acreage of peas to the canning plant. Or the producer agrees to care for a specified number of broilers, hens, or turkeys and turn over the birds or eggs to the processing or marketing firm.

The contractor may specify the variety of seed to be used, the particular strain of broilers or laying hens, the kind of fertilizer or feed to be used, and other specific practices the producer must follow.

The contractor may go even further and provide all the inputs needed and assure the producer a guaranteed minimum for operator labor and use of buildings and equipment.

Contracts involving farm products can range all the way from the preceding type of contract to one in which the farmer simply agrees in advance to sell a certain amount of a product to a particular buyer. The price may be determined in advance or it may be based upon a formula that takes into account the going market price at the time of delivery.

A high percentage of the production of broilers, eggs, turkeys, sugar beets, fruits, and vegetables has long been involved in various kinds of contractual arrangements.

In recent years the technique has been applied to cattle feeding, hog production, and certain feed crops and forage. Commercial feedlots will feed out the calves raised by cattle farmers; a feed manufacturer will make contracts with local farmers to produce feeder pigs or to raise market hogs.

Commercial feedlots often contract with nearby farmers to raise forage needed in the feedlot or to deliver feed grains on a regular schedule.

Each party to a contract is seeking some advantage in the arrangement. The producer often receives technical advice, financing for the production period, and is assured a market outlet. The contractor hopes to get a product that better meets the contractor's requirements for processing and marketing and that is delivered on a schedule that will permit more efficient use of the contractor's plant and labor.

Vertical integration is an alternative to contracts. It is used by input suppliers and processors to achieve control of two or more stages in the production and processing of food products.

Broiler processing firms that own hatcheries and feed mills and that engage in direct production (rather than production by contracts) are prime examples of a vertically integrated food system.

Canning companies that produce a portion of their crop requirements and cattle feeders that also own slaughter plants are other common examples.

Overall, the extent of contract production and vertical integration increased substantially between 1970 and 1980. About 22 percent of total farm production in 1970 was estimated to have been conducted under both forms of coordination, and the proportion increased to about 30 percent in 1980. Contract production increased from 17 to 23 percent and vertical integration from about 5 to 7 percent.

Sharpest increases in both contracting and vertical integration occurred for eggs and turkeys in the livestock sector, and in contracting for cotton, grains, oilseeds, and citrus and noncitrus fruits.

The major change in contract farming since 1970 has been a sharp increase in farmers' use of forward sales contracts in marketing cash grains, oilseeds, and cotton.

19. RISE OF U.S. PRODUCTION

Farmers in the United States produce 3.8 times more per work hour than in 1960 and over 15 times as much as in 1930.

Although large acreages were held out of crop production between 1960 and 1970, total U.S. farm output increased nearly as fast as U.S. population. During most of the 1970's, acreage was restored to production and output continued to increase, even faster than during the 1960's.

In the 1980's, cropland used for crops has stabilized somewhat, reaching about 372 million acres in 1985, compared with about 332 million in 1970.

An annual increase in farm production has come to be taken for granted, but in the early decades of this century farm production was almost on a treadmill.

Agricultural production in the United States rose nearly 1 percent per year from 1910 to 1930. It rose an average of 1.5 percent annually in the 1930's, 2.0 percent in the 1940's, 2.2 percent in the 1950's, 1.0 percent in the 1960's, and 2.2 percent in the 1970's. From 1980 to the record production realized in 1985, it has had an average annual increase of more than 2.7 percent.

Table 14.—Agricultural productivity

Year	U.S. Population (July 1) (millions)	Index of total farm output (1977 = 100)	Index of output per work hour (1977 = 100)	Crops harvested (million) acres)
1930	¹ 123.1	43	9	369
1940	¹ 132.1	50	12	341
1950	151.7	61	19	345
1955	165.3	69	26	340
1960	180.8	76	37	324
1965	194.4	82	52	298
1970	205.1	84	66	293
1975	216.0	95	89	336
1976	218.0	97	94	337
1977	220.2	100	100	345
1978	222.6	104	108	338
1979	225.1	111	119	348
1980	227.8	104	113	352
1981	230.1	118	131	366
1982	232.5	116	133	362
1983	234.8	96	122	306
1984	237.0	112	138	348
1985	239.3	² 119	² 155	² 343

¹Includes 50 States.²Estimated

III. INTERNATIONAL AGRICULTURAL TRADE AND AID

20. FOREIGN TRADE (EXPORTS)

The United States has remained the world's top exporter of agricultural products despite recent setbacks. In 1985, roughly 18 percent of the world's agricultural exports were shipped from the United States.

U.S. agricultural exports fell to \$31.2 billion in fiscal 1985, the lowest in 7 years, an 18 percent decline from the preceding year, and 29 percent below the all-time high of \$43.8 billion in fiscal 1981.

However, this downtrend belies the overall importance of exports to American agriculture. In 1985, nearly one in four cropland acres were exported, compared with 30 to 40 percent posted during 1979-83.

The foreign market provides a major outlet for a wide variety of U.S. farm commodities. This share has fallen from 26 percent in 1981 to about 15 percent in fiscal 1986.

The primary export commodities—wheat, corn, soybeans, cotton, and rice—all felt the effects of lower foreign demand.

Wheat exports fell from 55 percent in 1985 to 37 percent in fiscal 1986. Only 15 percent of cotton production was exported in 1986, compared with 48 percent in 1985. Likewise, 16 percent of the corn was exported in fiscal 1986, compared with 24 percent the year before.

Such declines indicate there is an imbalance in the system, as much of this surplus production winds up in stocks.

In fiscal 1985, exports of wheat and flour totaled \$4.4 billion. Feed grains exported came to \$6.9 billion and soybeans and products amounted to \$5.3 billion. These commodities accounted for more than half of the total exports of farm products.

U.S. agricultural exports required financing, inland transportation, storage, and ocean transportation for nearly 126 million tons in fiscal 1985.

Almost all of the \$31.2 billion worth of agricultural exports in fiscal 1984 represented commercial sales for dollars. About \$1.6 billion moved under Public Law 480 and Agency for International Development (AID) programs.

Although U.S. agricultural exports go to more than 130 countries around the world, 70 percent of those exports, totaling \$21.7 billion, went to only 15 countries in fiscal 1985. They were, in descending order of totals, Japan, USSR, the Netherlands, Canada, Mexico, South Korea, Taiwan, West Germany,

Spain, Egypt, Venezuela, Italy, the United Kingdom, Brazil, and Portugal.

On a regional basis, Asia (U.S. exports totaling \$11.9 billion) was the biggest regional market. The other areas were Western Europe (\$7.2 billion, which included \$6.7 billion to the 12 countries comprising the European Community); Latin America (\$4.6 billion); Africa (\$2.5 billion); the U.S.S.R. (\$2.5 billion); Canada (\$1.7 billion); Eastern Europe (\$0.5 billion); and Oceania (\$0.2 billion).

21. TRADE BLOCS

Over the past two decades, regional economic organizations—trade blocs—have had a significant impact on world trade in agricultural and industrial products.

Regional economic organizations are defined as free trade areas, customs unions, or common markets. Two or more countries that form a free trade area agree to eliminate tariffs on products that originate in their territories. Each member of the free trade area, however, maintains its own tariff schedule for imports from nonmembers.

A free trade area becomes a customs union or common market when the members agree to maintain a common external tariff on imports from nonmembers. In addition, there may be an effort to remove all internal barriers to permit the free flow of labor, capital, goods, and services (even energy).

The European Community (EC), originally composed of Belgium, France, West Germany, Italy, Luxembourg, and the Netherlands, and later joined by the United Kingdom, Denmark, and Ireland in 1973; Greece in 1981, and Spain and Portugal in 1986, is an example of such a common market.

The EC was formed in 1957. By 1968, tariffs among the six original member countries had been eliminated. Today, a common external tariff applies to imports from outside countries. A common agricultural policy covering nearly all farm commodities has eliminated differences in national agricultural policies and attempted to attenuate agricultural price differences.

The influence of the EC now extends far beyond the boundaries of the current 10 members. Sixty-five African, Caribbean, and Pacific countries, nearly all of which are former colonies or trust territories of EC countries, have been granted special trade and aid benefits by the EC. Most Mediterranean countries have preferential trade agreements with the EC.

The European Free Trade Association (EFTA), established in 1960, was originally formed as a temporary organization, an alternative to a wide European market. Its seven original

members included Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom (Great Britain and Northern Ireland). Finland joined EFTA as an associate member in 1961; Iceland became a full member in 1970.

The importance of EFTA as a trade bloc has diminished since the United Kingdom, Denmark, and Ireland joined the EC in 1973. Spain and Portugal have also been obliged to leave EFTA since joining the EC.

The United States and Israel concluded a free trade agreement in early 1985, which will progressively eliminate all tariffs over the next 10 years. The most sensitive agricultural products, such as processed tomato products and citrus juices, will not start the tariff reduction process for 5 years.

In 1949, Eastern bloc nations (except East Germany) formed the Council for Mutual Economic Assistance (COMECON). Later and separately East Germany, Mongolia, Cuba, and Vietnam joined, and Albania dropped out.

The purpose of COMECON is to improve trade and economic coordination among members according to "basic principles for the international socialist division of labor." More than half the foreign trade of member countries is with other COMECON countries and is governed by long-term agreements.

Since this trade is valued in nonconvertible units of exchange and prices are distorted by subsidies, COMECON's influence on world trade is hard to gauge. Though many members have expressed eagerness to trade more with nations that are not COMECON members, their prior obligations to COMECON have often prevented them from doing so.

In the Western Hemisphere, three major economic groups have emerged: The Latin American Integration Association (LAIA)—formerly the Latin American Free Trade Association or LAFTA—established in 1960; the Central American Common Market (CACM), formed in 1961; and the Caribbean Common Market (CARICOM), established in 1973.

Members of LAIA include Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uruguay, and Venezuela.

Five members of LAIA, the "Andean Group" of Bolivia, Colombia, Ecuador, Peru and Venezuela, also have established the Andean Common Market (ANCOM).

The members of the Central American Common Market (CACM) are Guatemala, El Salvador, Honduras, Nicaragua, and Costa Rica. CACM is plagued by many problems. Tensions have been provoked by intercountry disputes as well as internal problems of the members.

The members of CARICOM include the following former

British Caribbean dependencies: Jamaica, Trinidad and Tobago, Barbados, Guyana, Antigua, St. Kitts-Nevis-Anguilla and Montserrat, Dominica, St. Lucia, St. Vincent, Grenada, and Belize.

22. EXPORT MARKET SERVICES

Holding and expanding the U.S. share in world markets, which provide an outlet for the production of nearly 40 percent of harvested crop acres, is crucial to U.S. farm incomes and important to the entire economy.

Today about one-fourth of net farm income comes from overseas sales. Moreover, farm exports sustain about a million U.S. jobs, strengthen the dollar, cut tax costs for farm programs, and stimulate production of food for the benefit of all consumers.

To maintain and expand the level of exports requires a vigorous export market development program.

The Department's Foreign Agricultural Service (FAS) promotes commercial exports by conducting a market development program abroad in cooperation with agricultural export trade associations that represent a wide variety of U.S. commodities.

FAS works with 44 of these associations—known as cooperators—which in turn work with approximately 1,600 overseas organizations, 1,500 U.S. cooperators, and 8,000 to 9,000 private U.S. firms. In addition, FAS works with four regional State groups and the National Association of State Departments of Agriculture, which collectively represent virtually every State.

Cooperator activities are carried out under contractual agreements with the Department. Promotion activities are proposed in annual marketing plans developed by the cooperator and submitted to USDA for approval.

The cooperator program uses two basic approaches to market promotion: One of them is trade servicing, which means helping the buyer choose the right U.S. product and use it efficiently.

Trade servicing is usually used to encourage sales of bulk, unprocessed commodities such as soybeans and feed grains. The other method is direct promotion, used by cooperator and State groups representing producers of semiprocessed and consumer products.

FAS also conducts brand identified promotions with 11 private U.S. firms participating in the Export Incentive Program (EIP).

A second export related program managed by FAS is the Targeted Export Assistance, or "TEA," Program.

Section 1124 of the Food Security Act of 1985, as amended, provides that for each of the fiscal years 1986 through 1988, the

Secretary of Agriculture shall use not less than \$110 million on commodities owned by CCC for activities authorized by the Secretary to counter or offset the adverse effect on the export of a U.S. agricultural commodity or the product thereof of a subsidy, import quota, or other unfair foreign trade practice.

For each of the fiscal years 1989 and 1990, the minimum dollar amount of funds or commodities required to be used for such purposes increases to not less than \$325 million.

Priority for such export assistance is to be provided for agricultural commodities or products with respect to which there has been a favorable decision under Section 301 of the Trade Act of 1974, or for which exports have been adversely affected by retaliatory actions related to a favorable 301 decisions.

In general, the TEA program is being funded entirely through issuance of CCC generic commodity certificates, rather than through payment of CCC funds. Targeted export assistance is being provided through program agreements, generally of no more than 12 months' duration, with U.S. trade associations, State-sponsored organizations, or private firms to conduct specific market development projects for eligible commodities in specified countries.

Two basic programs operate under the auspices of the TEA program: A generic promotional program with nonprofit agricultural associations and State organizations, TEA, and a brand-identified or high-value promotional program with private U.S. firms, TEA/EIP.

FAS sponsors overseas trade shows featuring U.S. food products, in-store promotions of U.S. foods, and U.S. sales-team visits to foreign buyers. FAS also maintains an Agricultural Information and Marketing Service (AIMS) in which foreign buyer requests for U.S. agricultural products are matched by computer with U.S. suppliers.

FAS also has a product and label clearing service for U.S. sellers who want to get their product contents and label approved by foreign governments.

FAS also maintains trade offices throughout the world to service key foreign export markets in major or emerging trade areas more directly. Trade offices are now located in Seoul, Korea; Tokyo, Japan; London, England; Hamburg, West Germany; Manama, Bahrain; Singapore; Warsaw, Poland; Caracas, Venezuela; Lagos, Nigeria; Tunis, Tunisia; Beijing and Guengzhou, China; Algiers, Algeria; Istanbul, Turkey, and Jidda, Saudi Arabia.

The Public Law 480 program, titles I, II, and III (also called the Food for Peace Program) and the Commodity Credit Corporation (CCC) Export Financing Programs allow FAS to provide both

concessional and commercial financing of U.S. agricultural exports to maintain and expand overseas markets.

P.L. 480 is aimed at long-term improvement in the economies of developing countries.

Title I (the concessional sales part of P.L. 480) provides for financing sales of U.S. commodities on low-interest, long-term credit.

Title II is a direct donation program.

Title III, known as the Food for Development Program, allows foreign governments to buy U.S. agricultural commodities on title I terms on a multiyear basis and resell these commodities in their own countries. Proceeds from these sales, or the commodities themselves, are used for specific self-help projects. As the currencies are used, an equivalent dollar value to the title I debt is offset or forgiven.

The 1985 Farm Bill authorized two new activities under the authority of the P.L. 480 program: The Food for Progress and Local Currency Initiative programs.

Food for progress agreements may use the authority of P.L. 480 or section 416. The program provides at least 75,000 tons of agricultural commodities for needy countries, mainly in Africa, to encourage agricultural reform. Agreements have been signed with Madagascar and Guinea, who will provide 60,000 metric tons of rice under section 416 authority.

The goal of the Local Currency Initiative program is to generate economic growth via the private sector in recipient countries. To achieve this goal, sales of U.S. products for local currency were reinstated. These local currencies will be owned by the U.S. Government and loaned to private financial intermediaries in the title I countries.

These financial intermediaries will relend the local currencies to local private businesses to encourage economic growth. The guidelines for this program have been developed and the program was to be operational early in fiscal year 1987.

The CCC Export Credit Guarantee Program (GSM-102) is particularly helpful in opening new markets, preserving or increasing the U.S. share of existing markets, or preventing a decline in the share or loss of a U.S. market. It has been a valuable tool in assisting developing countries in their transition from purchasing under concessional and aid-type programs to making commercial purchases. Its usefulness as a financing tool is dependent upon the particular economic environment in the importing country as well as the price competitiveness of the U.S. commodity.

An additional Commercial Export Credit Guarantee Program (GSM-103) was authorized by the 1985 Farm Bill. This program

permits 3 to 10-year loans designed to help developing nations make the transition from concessional financing to cash purchases. The GSM-103 program for breeder livestock has been announced and programs for other commodity groups are under development.

The GSM 102 and 103 programs provide credit guarantees to protect the U.S. exporter or the exporter's assignee against both commercial and noncommercial (political risk) defaults. This is accomplished under a foreign bank letter of credit for export financing of U.S. agricultural commodities on a deferred payment basis for periods ranging from 6 months to 10 years.

In May 1985, the Secretary of Agriculture announced implementation of an export enhancement program. The program's major objectives are to expand U.S. agricultural exports and to encourage U.S. trading partners to begin serious negotiation on agricultural trade problems.

The program offers government-owned commodities as bonuses to exporters to expand sales in targeted export markets. Competitive bids are offered to the Commodity Credit Corporation (CCC) by exporters to obtain the bonus commodities. The program involves up to \$2 billion of CCC-owned commodities during the fiscal years 1985-88.

Initiatives under the program must satisfy four criteria:

(1) **Additionality**—Sales must increase U.S. agricultural exports above what would have occurred in the absence of the program;

(2) **Targeting**—Sales will be targeted on specific market opportunities, especially those that challenge competitors that subsidize their exports;

(3) **Cost effectiveness**—Sales should result in a net plus to the overall economy, and

(4) **Budget neutrality**—Sales should not increase budget outlays beyond what would have occurred in the absence of the program.

23. FUTURE MARKETS ABROAD FOR WORLD TRADE EXPANSION

The U.S. agricultural community is beginning to look increasingly toward less developed and developing countries as its potentially largest future markets for agricultural exports.

Three-fourths of the world's population lives in the "Third World," an area where rapid population growth is projected for coming years. Because the demand for food supplies increases in direct proportion to population growth, one might easily but mistakenly assume that this circumstance alone would create a potentially thriving market for U.S. agricultural goods.

But many people in less developed countries live in poverty, with the poorest of the poor earning less than \$400 per capita annually. They lack the means to purchase adequate food and fiber, which results in chronic hunger and malnutrition, with little improvement seen for future generations.

So it is not hunger or rapid population growth that make countries better customers for U.S. farm producers. Rather, it is increased purchasing power resulting from their growing wealth and improved standards of living. People's standard of living rises when they improve their economic condition, in turn allowing them to buy needed goods and services.

Agriculture remains the main source of income for most people living in less developed countries.

USDA technical assistance projects help build the infrastructure and human resources needed by developing countries to achieve self-reliance, while at the same time ensuring future world food supplies.

Technology transfer from the United States to developing countries in animal and plant disease control, soil and water conservation, management of public forests and rangelands, economic analysis and forecasting, and information and marketing services provides developing countries modern techniques they can use in developing successful agricultural strategies.

Programs do not benefit major competitor nations, and requests for technical assistance from these nations are not entertained.

Education plays a powerful role in development efforts. In 1985, more than 2,500 people from over 100 countries were trained by USDA in the agricultural sciences.

USDA's 30-year record of assisting developing nations with academic and on-the-job training, observational tours, and technical training clearly shows a U.S. commitment to global development.

A vital agribusiness sector spurs trade and investment opportunities, and promotes economic development in developing countries as well as in the United States.

Programs like the U.S. Caribbean Basin Initiative stimulate U.S. entrepreneurial interest in agricultural trade and investment opportunities.

Duty-free access of nontraditional and/or off-season products from the Caribbean Basin, such as fresh fruits and vegetables and ornamental plants, provides a strong incentive for U.S. agribusinesses to consider joint ventures with Caribbean Basin partners.

Scientific cooperation through team exchanges and collabora-

tive research with other countries enables the United States to share agricultural data and collect exotic germplasm and biological materials.

A unique feature of the cooperation between U.S. and foreign scientists is that it involves scientific work that could not be done in the United States, yet it directly benefits U.S. citizens.

For example, exchanges of soybean germplasm between the United States and the Soviet Union have led to the discovery of traits resistant to brown stem rot and soybean cyst nematode, both threats to U.S. crops.

Long-term field research by U.S. scientists in other countries on citrus canker, the Mediterranean fruit fly, and Africanized bees provides prepared, experienced experts ready to protect crops if a crisis should strike in the U.S. agricultural community.

Keeping U.S. policy views on the record, USDA also presents the concerns of U.S. agriculture in dealings with international organizations working in the areas of agriculture and rural development, such as the World Food Program, and development banks like the World Bank.

Keeping U.S. positions on agricultural issues in the mainstream of discussions by these organizations and promoting good will globally is the job of the Office of International Cooperation and Development (OICD).

24. U.S. RESPONSE TO WORLD HUNGER

The United States is the world's largest food donor. It has provided more food assistance to developing countries than all other nations combined—more than \$30 billion in commodities since the passage of Public Law 480 in 1954.

P.L. 480, formally known as the Agricultural Trade Development and Assistance Act of 1954, or the Food for Peace Program, has been the major U.S. Government tool for providing food aid for more than 30 years.

In 1985, the United States exported \$1.3 billion under the Food for Peace Program. African drought relief accounted for this higher-than-usual level of food aid.

In 1986, the food situation changed dramatically. Nearly every African country suffering from food shortages in 1985 had an improved harvest in 1986. Most countries did not require exceptional food assistance in 1986; and in some cases, food recipients of 1985 could have been food suppliers in 1986.

As of February 1986, the United States had authorized 1.46 million metric tons of food aid valued at \$445.37 million for the 1985-86 crop year. This accounted for nearly 60 percent of food pledged for the crop year for sub-Saharan Africa.

25. FOREIGN TRADE (IMPORTS)

The United States was among the world's six largest importers of agricultural products in 1984. Other large agricultural importers included West Germany, Japan, the United Kingdom, the U.S.S.R., Italy, and France.

U.S. agricultural imports totaled over \$19.7 billion in fiscal year 1985. Of this amount, imports of supplementary (partially competitive) products totaled \$12.9 billion. Complementary (noncompetitive) products totaled \$6.8 billion, consisting mainly of tropical products such as coffee, cocoa beans, bananas, crude natural rubber, spices, and tea. About one-half of the agricultural imports, including almost all of the complementary items, were duty-free.

Agricultural commodities were imported by the United States from more than 160 countries in fiscal 1985, but about 86 percent of those imports were from only 25 countries.

The largest suppliers of agricultural products to the United States in fiscal 1982 were Brazil (\$2.4 billion); Canada (\$1.9 billion); Mexico (\$1.3 billion); and Australia (\$0.8 billion). Other countries supplying over a half billion dollars each in agricultural products to the United States in fiscal 1985 included Indonesia, Colombia, France, New Zealand, the Netherlands, Denmark, West Germany, Italy, and Ecuador.

26. BALANCE OF PAYMENTS

A statement of economic transactions involving the exchange of goods, services, and capital claims between a country and foreign countries is called a "balance of payments."

People in the United States pay people in other countries for imported goods and services. Money also is transferred to foreign countries for economic and military assistance, for investment, private remittances, pensions, and other purposes.

The United States also receives money from other countries, mainly in payment for exports and services, mutual defense, investment, and repayments on U.S. Government and commercial loans.

When the outflow of money is greater than the incoming money, a deficit occurs. When the amount of incoming money exceeds the outflow, a surplus is said to have accumulated.

Agricultural exports give the United States substantial balance of payments help. During fiscal years 1960 through 1985, commercial exports of U.S. farm products brought over \$460 billion back to the United States. In fiscal 1985 alone, commercial farm exports totaled \$29.6 billion. Exports under Government programs such as Public Law 480 (Food for Peace) totaled

over \$32 billion for the 25-year period; in 1985 alone, exports under these programs amounted to \$1.6 billion.

The aggregate net contribution of agricultural exports to the U.S. balance of payments for 1960 through 1985 was \$212 billion. The contribution in 1985 was more than \$11 billion.

IV. FOOD MARKETING, PROTECTION, DISTRIBUTION

27. COST OF FOOD SERVICES AND DISTRIBUTION

The estimated bill for marketing domestic farm foods—which does not include imported foods—was \$257 billion in 1985. This covered all charges for transporting, processing, and distributing foods that originated on U.S. farms. It represented 75 percent of the \$344 billion consumers spent for these foods. The remaining \$86 billion represented the payment, or gross return, that farmers received.

The cost of marketing farm foods has increased considerably over the years, mostly because of rising costs of labor, transportation, food packaging materials, and other inputs used in marketing, and also because of the growing volume of food and increase in services provided with the food.

In 1975, the cost of marketing farm foods amounted to \$111 billion. In the past decade the cost of marketing rose about 131 percent. In 1985, the marketing bill rose 7 percent.

These rising costs have been the principal factor affecting the rise in consumer food expenditures. From 1975 to 1985, consumer expenditures for farm foods rose \$177 billion. Over four-fifths of this increase resulted from an increase in the marketing bill.

The cost of labor is the biggest part of the total food marketing bill. Labor used by assemblers, manufacturers, wholesalers, retailers, and eating places cost \$117 billion in 1985. This was 7 percent more than in 1984 and 142 percent more than in 1975.

Labor costs have risen more slowly in recent years, because of smaller increases in wages and salaries. Improvements in output per workhour, or productivity, have slowed significantly since 1975 and offset a very small part of the rise in hourly earnings of food marketing employees.

Between 1975 and 1985, the total number of food marketing workers increased 37 percent. The total number of food marketing workers in 1985 was about 11 million, about double that of a decade ago. The growth in employment, however, was largely confined to public eating places.

28. FOOD EXPENDITURES AND PRICES

Total food expenditures, which include imports, fishery products, and food originating on farms, were \$415.9 billion in

1985, an increase of 4.8 percent over those in 1984. The average was \$1,738 per capita, 5.5 percent above the 1984 average.

Food expenditures rose the same as per capita disposable income, which increased 4.9 percent from 1984 to 1985. Retail food prices (including meals served in restaurants) rose 71.3 percent during the last 10 years. Prices of food eaten away from home increased 86.2 percent, while retail foodstore prices increased 65.3 percent.

Prices of goods and services, excluding food, in the Consumer Price Index climbed 106.4 percent during the 10 years. Transportation was up 93.3 percent; housing, 100.4 percent; medical care, 118.2 percent; and apparel and upkeep, 39.6 percent.

29. FARM-RETAIL PRICE SPREAD

Food prices include payments for both the raw farm product and marketing services. In 1985 the farm value, or payment for the raw product, averaged 31 percent of the retail cost of a market basket of U.S. farm foods sold in foodstores. The other 69 percent, the farm-retail price spread, consisted of all processing, transportation, wholesaling, and retailing charges incurred after farm products leave the farm.

Over the past 10 years, the farm-retail spread has risen much more than the farm value; the farm share declined.

Farm-retail spreads have increased every year for the past 10 years, largely reflecting rising costs of labor, packaging, and other inputs. In 1985, farm-retail spreads rose 5.5 percent. Farmers received 7.2 percent less for food commodities in 1985 than they did the preceding year. Widening farm-retail spreads continued to push up food costs in 1986. The farm value was expected to decline about 2 percent in 1986.

The share of the food dollar spent in grocery stores represented by the farm value was expected to average about 30 cents in 1986. This share ranged from 31 to 40 percent during the past decade.

The percentage of the retail price accounted for by farm value varies widely among foods, reflecting differences in production and marketing functions. It is larger for animal products than for crop-based foods. Farm value is a relatively small share of the retail selling price of foods that require considerable processing and packaging. The wide variation in the farm value share among major food groups in the farm food market basket is shown in table 15.

Table 15.—Farm value as a percentage of retail price for domestically produced foods, 1975 and 1985

Items	1975	1985
Livestock products:		
Meats	57	45
Dairy	50	45
Poultry	59	53
Eggs	66	61
Crop products:		
Cereal and bakery	19	10
Fresh fruits	30	24
Fresh vegetables	35	26
Processed fruits and vegetables	21	22
Fats and oils	34	26
Market basket, average	40	31

30. PER CAPITA FOOD CONSUMPTION

Per capita food consumption in 1985 rose slightly above the 1984 level. The food consumption index for all foods was up 2 percent. The increase was due to a 1 percent increase in usage of animal products and a 3-percent increase in crop products.

Per capita food consumption increased 5 percent in the decade ending in 1985. The consumption of foods from crops rose 7.8 percent, while that of foods derived from animals increased 2.8 percent.

The increase in consumption of crop-related foods was in fresh fruits and vegetables, sweeteners, potato products, and vegetable fats. Consumption of cereal products also increased.

Among the livestock-related products, consumption of poultry and fish was up. Red meat and dairy product consumption declined.

31. FOOD PURCHASE PROGRAMS

Each year, through the Agricultural Marketing Service (AMS), USDA buys substantial quantities of food that are donated to schools, needy persons, public institutions, the elderly, and disaster victims.

Donations of food started in the 1930's with programs to help market some of the surplus products farmers couldn't sell and to get the surplus products to people who couldn't afford to buy them. Donations of foods stored under price support programs began in 1949.

Some of the laws that govern USDA food purchases are the following:

Section 32 of the act of August 24, 1935, as amended, which expands market outlets for agricultural products.

Section 6 of the National School Lunch Act, as amended, which requires the purchase of commodities to supplement food programs to help insure nutritionally adequate meals for children.

Section 416 of the Agricultural Act of 1949, which authorizes donation of foods from Commodity Credit Corporation (CCC) stocks.

Section 709 of the Food and Agriculture Act of 1965, which authorizes CCC to purchase dairy products at market prices when CCC stocks are not available.

Section 4(a) of the Agriculture and Consumer Protection Act of 1973, as amended, which authorizes funds to maintain the level of donations for domestic assistance programs except for schools without regard to previous restrictions on price. Similar authority for schools is provided under the National School Lunch Act, as amended.

Section 311 of the Older Americans Act of 1965, as amended, which authorizes funds for nutrition programs for the elderly.

During fiscal year 1986, USDA furnished about 2.8 billion pounds of food for distribution in the school lunch and other feeding programs, at a cost of about \$2.0 billion.

32. FOOD ASSISTANCE PROGRAMS

USDA's Food and Nutrition Service has several programs which provide food assistance to needy families and children. These programs provided nearly \$20 billion in food aid to low-income Americans in 1985. All programs are operated in cooperation with State and local governments.

The Food Stamp Program helps low-income families improve their diets by providing them with coupons to purchase food at any authorized retail food store. The program was started in 1961 as a pilot project. Food stamps are now available in every county in the United States. Nearly 20 million people are currently served by the Food Stamp Program at an annual cost of over \$11 billion.

The Food Distribution Program distributes foods acquired under price support, surplus removal, and special purchase programs directly to schools, institutions, disaster relief agencies, summer camps, nutrition programs for the elderly, and needy family programs on Indian reservations.

In addition, millions of low-income people receive free surplus Government commodities donated by USDA and distributed by local agencies and volunteers. The list of available "free"

commodities for special distribution now includes butter, nonfat dry milk, honey, flour, rice, cornmeal and cheese.

The Child Nutrition Programs benefit children from low-income families through school lunches, school breakfasts, and year-round and summer food service programs in nonschool situations such as day care centers and recreation programs. Federal contributions in cash and foods totaled about \$4.7 billion in 1986.

The National School Lunch Program helps participating schools serve meals that meet nutritional standards (set by the Secretary of Agriculture) to children across the country. The meals are federally subsidized, in cash and commodities, so that participating schools can offer free and reduced-price lunches to children of needy families. Approximately 24 million children are served each day at an annual cost of \$3.5 billion.

The School Breakfast Program, which is similar to the lunch program, provides nutritious breakfasts to children at school. The program currently serves breakfasts to over 3.0 million children, 89 percent of which are eligible for free or reduced-price meals.

The Special Milk Program helps schools and other nonprofit child care institutions not participating in any other federally subsidized meal program make fluid milk available to children. The fluid milk helps offset the cost of milk to paying children and provides free milk to those who qualify. The program currently serves an average of 760,000 million children daily.

The Child Care Food Program provides food service to needy children in the summer or during extended school vacations. Public or nonprofit private nonresidential institutions or residential summer camps may sponsor the program. This program currently reaches over 1 million children.

The Special Supplemental Food Program for Women, Infants, and Children (WIC) provides cash grants to States to make specific supplemental foods and nutrition education available to pregnant, breast-feeding, and postpartum women, and infants and children up to 5 years of age. The program operates in 50 States, the District of Columbia, Guam, Puerto Rico, and the Virgin Islands. It is also operated by 33 Indian tribal organizations. It is currently reaching 3.3 million people.

The Commodity Supplemental Food Program (CSFP) provides a variety of federally purchased foods to supplement the diets of low-income pregnant, breast-feeding or postpartum women, and infants and children under 6 years of age. Currently, the program serves over 139,000 participants up to age 6.

In addition, persons 60 years of age and older can also receive various commodities provided through the CSFP. An

average of 24,000 low-income elderly persons were served in fiscal year 1986.

33. HUMAN NUTRITION RESEARCH AND EDUCATION

In the Food and Agriculture Act of 1977, Congress mandated the U.S. Department of Agriculture to implement the first comprehensive national plan for human nutrition research and education programs.

Increased interest in human nutrition research has resulted from a number of developments, including a growing conviction that proper nutrition is a primary component in preventive health care, and that a relationship exists between diet and some of the chronic degenerative diseases in the United States.

Research in human nutrition is defined broadly to include research on specific nutrient requirements and food composition; the relation of diet to disease; food safety; and factors influencing nutritional practices, food choices, and consumption behavior.

USDA's Human Nutrition Information Service (HNIS) monitors and reports on the dietary status of the population at three levels: (1) The nutrient content of the U.S. food supply, (2) the food consumption and dietary levels of households, and (3) the food and nutrient intake of individuals.

Nationwide Food Consumption Surveys are conducted by HNIS to provide data on households and individuals. These data are analyzed by USDA and others to monitor dietary status and identify factors affecting food expenditures, food consumption, and the nutritional quality of diets. HNIS also conducts methodological research related to the surveys.

HNIS compiles information and sponsors research on the nutrient composition of foods (Agriculture Handbook No. 8) for use in its national surveys and for publication and use in computer calculations.

The agency conducts nutrition education research and develops research based food guidance and techniques for its use in helping the public make informed food choices.

Human nutrition research currently being conducted by USDA's Agricultural Research Service focuses on:

Human nutrition requirements.

Human requirements for protein, fat, carbohydrates, vitamins, and minerals must still be defined. New methods are being developed for food sampling, analysis, and reporting.

The role of trace elements.

Trace elements such as zinc, nickel, and copper have particular functions in the diet. They include interaction with other dietary components such as fiber, physiological and biochemical influences on minor elements according to age group, and the biological availability of minerals.

Nutritional effects during pregnancy, lactation, and early life.

Standards for nutrient intake and methods for assessing nutritional status are being developed for infants, children, and pregnant and lactating women. The role of diet in optimum growth and development is being studied.

Assessment of individual nutritional status.

Factors, forces, and trends that cause malnutrition can be identified, and criteria can be developed for the design and evaluation of nutrition intervention programs.

Nutritional needs of the elderly.

Research is directed toward identifying the role of human nutrition in the aging process and in maintaining health throughout the lifespan.

34. MEAT AND POULTRY INSPECTION

All meat and poultry sold in interstate or foreign commerce must be federally inspected for wholesomeness and truthful labeling.

Meat and poultry sold in intrastate commerce may be inspected under State inspection programs equal to the Federal program. If a State is unable to operate its own inspection program, USDA's Food Safety and Inspection Service (FSIS) must assume responsibility for intrastate inspection as well.

FSIS inspectors examined nearly 121 million meat animals and more than 4.8 billion birds in fiscal year 1985. In addition, more than 53 billion pounds of processed poultry products and more than 66 billion pounds of processed meat products were inspected.

Meat and poultry that is unwholesome, adulterated, or mislabeled is kept out of the consumer food supply. During 1985, FSIS inspectors condemned as unwholesome more than 47 million birds and 377,000 meat animals.

USDA compliance officers maintain constant vigilance in marketing channels to check for uninspected meat and poultry, counterfeit inspection stamps, inaccurate labels, and contaminated or spoiled products.

USDA may detain any suspect product, and criminal charges may be brought against anyone in marketing channels who violates the Federal meat and poultry inspection laws.

Each foreign plant that ships meat or poultry to the United States and the inspection system of the country in which is located must be certified by USDA. Federal veterinarians visit the plants as often as necessary to insure compliance with USDA requirements, but must visit them at least once a year to check on the adequacy of foreign inspection.

At U.S. ports of entry, USDA inspectors examine shipments, as an additional safeguard, to see that imported products meet U.S. standards for wholesomeness and proper labeling. In fiscal year 1985, FSIS inspectors approved 2.4 billion pounds of products for entry into the United States; more than 19 million pounds was rejected.

Standards and labeling requirements are important phases of the inspection system. In fiscal year 1985, USDA labeling specialists examined for accuracy and completeness over 134,000 label designs submitted by processors for advance approval. These specialists also make sure that ingredient statements on products list the ingredients in order of predominance.

USDA gives special attention to monitoring meat and poultry for possible drug, pesticide, and chemical residues. As part of this effort, FSIS maintains a contamination response system (CRS) to assure rapid communication during discovery and cleanup of environmental contamination problems in the food supply.

USDA conducts a public information campaign to alert consumers to the fact that improper handling of meat and poultry may result in food-borne bacteria poisoning. Should such poisonings occur, a special USDA epidemiological unit works with local, State, and Federal public health agencies to speed identification of the cause.

35. EGG PRODUCTS INSPECTION

The purpose of the Egg Products Inspection Act is to assure that eggs and egg products that reach the consumer are wholesome and unadulterated. Egg products are used by many large manufacturers to make cakes and other prepared food products.

Under the act, the Agricultural Marketing Service (AMS)

provides continuous mandatory inspection in all plants processing liquid, dried, or frozen egg products. The act also controls the disposition of restricted shell eggs, those that might contain harmful bacteria that could cause foodborne illness.

In fiscal year 1985, AMS inspected some 1.3 billion pounds of liquid, frozen, and dried egg products in 102 processing plants.

USDA and cooperating State agencies registered 3,698 egg handlers and hatcheries and made 13,554 inspection visits to assure that restricted shell eggs were disposed of properly.

About 12,000 individual chlorinated hydrocarbon residue determinations were made, and no violative products were detected.

Under the act, egg products from a foreign country can be imported into the United States only if the country's inspection system is equivalent to that of the United States. The Canadian system, found equivalent in 1977, remains the only one eligible to export egg products to this country.

V. FARM PRODUCTION AND MARKETING PROGRAMS

36. PRODUCTION ADJUSTMENTS

The Food Security Act of 1985 authorizes programs to protect farmers' incomes through target prices for wheat, feed grains (corn, sorghum, oats, and, if designated, barley), upland cotton, and rice. The programs, administered by the Agricultural Stabilization and Conservation Service (ASCS), also provide measures aimed at assuring an adequate supply of food and fiber at reasonable prices.

The act continued the authority for the Secretary of Agriculture to establish an acreage reduction program for any of the crops or a set-aside program, if the Secretary determines that the total supply would be excessive in the absence of such a program.

An acreage reduction program was implemented in 1986 for the fifth consecutive year. The acreage reduction is achieved by applying a uniform reduction percentage to each participating farm's acreage base for a specific crop. This acreage base is determined from the history of the crops planted or considered planted on the farm.

The acreage reduced from production (the Acreage Conservation Reserve) must be devoted to conservation use measures sufficient to protect the land from weeds, and from wind or water erosion.

The act also authorizes a voluntary paid land diversion for producers of rice, feed grains, upland cotton, and wheat if the Secretary determines that such adjustment is necessary to reduce production. Acreage removed from production under this program must also be devoted to a conservation use.

For most kinds of tobacco and peanuts, earlier legislation provided for marketing quotas. The Secretary of Agriculture must proclaim these quotas when supply prospects exceed specified levels. If approved by two-thirds or more of the producers of each commodity voting in a referendum, the marketing quotas become mandatory for all producers of that commodity, and price support also becomes mandatory.

Tobacco program amendments enacted April 1986 provide for growers and buyers to share equally the assessments to operate the price support and production adjustment program at no net cost to the taxpayer, other than the administrative expenses common to the operation of all price support programs.

The peanut program features a two-tier price support system and poundage quotas. Acreage allotments have been

suspended for the 1986-90 crops. The poundage quota is the quantity estimated to be devoted to domestic edible, seed, and related use.

Price support will be available on peanuts produced within the poundage quota (quota peanuts) at the higher domestic edible peanut support rate. The quota support rate for 1986 was \$607 per ton, and the figure is adjusted each year by any increase in production costs.

Anyone can grow and contract additional peanuts for export or domestic crush. Additional peanuts are supported at levels taking into account world market prices and potential losses to the Government. For 1986, this rate was \$150 per ton.

The 1985 act also provides a new program to reduce the surplus of milk produced in the United States. A dairy termination program gave producers the opportunity to terminate milk production and dispose of their whole herds by selling for slaughter or export all the female dairy cattle in which they had a financial interest.

Participating dairy operators receive incentive payments based on their history of milk marketings and their offered bids to cease this production. Herd disposition takes place over an 18-month period, and program payments are made over a 5-year period.

37. INCOME AND PRICE SUPPORT PROGRAMS

Producers complying with the announced farm programs are eligible for Commodity Credit Corporation (CCC) loans and purchases, target price protection (deficiency payments), and land diversion payments when applicable.

The target price is designed to provide income support for producers when the market price is depressed. The payment is based on a rate by which the target price exceeds the larger of the national weighted average market price or the national price-support loan rate for the crop. The farm payment is determined by multiplying the rate times the product of the planted acreage within the permitted and the established yield on a farm. Price support to farmers is provided through commodity loans or other means for food grains (wheat, rice, and rye); feed grains (corn, sorghum, barley, and oats); oil crops (soybeans and peanuts); fibers (wool, mohair, and cotton); milk; tobacco; honey; sugar beets, and sugarcane.

The loan programs are financed by the CCC and administered by USDA's Agricultural Stabilization and Conservation Service (ASCS).

Price support assistance for wheat, rice, feed grains, cotton,

peanuts, and tobacco is usually contingent upon participation by the farmer in applicable annual programs. The assistance to participating farmers is provided at preannounced levels set within statutory guidelines. Methods include loans on crops held in storage by farmers, market purchases in times of excess supply, and supplemental payments to wool and mohair producers.

Loans on eligible commodities are made to producers through ASCS county offices and approved cooperatives. The loans are "nonrecourse;" if market prices rise above the loan level, the producer can pay off the loan with interest, and sell the crop on the market.

If prices fall below the loan level, the producer can turn the commodity over to the CCC in full payment of the loan. Price support on tobacco and peanuts is made through producer associations acting for individual producers. Price support to sugar beet and sugarcane producers is provided through loans to eligible sugar processors.

The Food Security Act of 1985 mandated new market enhancement plans (marketing loans) for cotton and rice to make those commodities more competitive in the world market by allowing a producer to repay price support loans at less than the loan rate when world prices are below the basic loan rate. The act also authorized marketing loans for wheat, feed grains, and soybeans, if the Secretary determined they were necessary to maintain those grains' competitiveness in domestic and world markets.

Milk prices are supported mainly by the buying of excess market supplies of dairy products, such as cheese, butter, and dry milk, from processors.

The total amount of payments a person may receive under one or more of the annual programs for wheat, feed grains, cotton, and rice is usually limited to \$50,000 for deficiency and diversion payments.

Some of the program payments to producers are paid partially with CCC commodity certificates. The majority of commodity certificates are generic and can be used by a producer to redeem loans on any commodity, or for any CCC-owned commodities. The certificates are also negotiable and can be sold to another producer or to a commercial entity.

38. GRAIN RESERVE PROGRAM

The Food Security Act of 1985 reauthorized the *Grain Reserve Program* for farmer-owned wheat, corn, grain sorghum, oats, and barley. It provides 3-year extended loans to producers, who

receive annual storage payments under the contract.

Program provisions stipulate when interest is charged and provide a release price at which storage payments cease and producers may repay their loans. A new *Special Producer Loan Program* will allow the producer to obtain a new loan for an additional year.

Producers will receive annual advance storage payments at the same rates currently earned under the reserve program, and may repay the loan at any time during the 1-year period.

The *Farm Facility Loan Program* helps qualifying producers obtain needed on-farm storage for their crops. Applications for these loans are accepted by county ASCS offices only during periods announced by the Secretary of Agriculture.

39. EMERGENCY LIVESTOCK FEED

In emergencies caused by natural disasters, USDA provides feed assistance to livestock producers through programs administered by the Agricultural Stabilization and Conservation Service (ASCS).

The *Emergency Feed Assistance Program* provides for the sale of CCC-owned grain at 75 percent of the basic county loan rate to livestock producers whose feed production has suffered because of drought or excess moisture.

Under the *Feed Cost-Sharing Program*, USDA shares with livestock producers the cost of purchasing feedgrains, including hay. The cost share is up to 50 percent of the cost of feed, not to exceed 5 cents per pound. The cost-sharing payments are made in generic commodity certificates.

Both programs are national in scope. They are available to farmers and ranchers in counties designated by the Secretary of Agriculture as eligible.

Under both programs, eligible livestock producers must have insufficient feed available to preserve and maintain their foundation livestock.

To provide additional forage for livestock in emergencies, USDA can also allow haying and grazing on acreage diverted to conserving uses under the commodity support programs.

40. MARKETING ORDERS

A Federal marketing order gives farmers a means of solving a wide range of problems through unified action. It is a flexible tool. It can be tailored to the needs of those using it. It is a legal tool. It has the force of law, with Government (USDA) assuring an appropriate balance between the interests of agriculture and the general public.

Each partner—producers and Government—has a unique role. Producers initiate orders and participate in administering them when the orders so provide. USDA, through its Agricultural Marketing Service (AMS), furnishes guidance and sees that the orders are properly administered and enforced.

Marketing order authority is broad and varied, but the basic purpose is to provide the orderly marketing of fruits, vegetables, and milk, and to assure a flow of adequate supplies.

A proposed order for eggs was pending as of September 30, 1986.

Milk: Federal milk marketing orders establish minimum prices, based upon supply and demand conditions, at which milk handlers or dealers may buy milk from dairy farmers. The order must be approved by at least two-thirds of the farmers supplying milk to the marketing area. A favorable vote by three-fourths of the producers is required under some circumstances. Public hearings are held when establishing new orders or making order changes.

Operating at the first level of trade, where milk leaves the farm and enters the marketing system, Federal orders lay the foundation for building more stable marketing conditions. They contain a built-in flexibility needed to cope with market changes. To those living in Federal milk marketing areas, this helps assure a steady supply of fresh milk. Most of the Nation's major population centers are within a milk marketing order area.

Fruits, Vegetables, and Specialty Crops: Growers of certain fruits, vegetables, and specialty crops (spearmint oil, hops, and some nut crops are examples) use marketing agreements and order programs to bring greater stability and orderliness to marketing.

There were 48 such programs in fiscal year 1986 (Oct. 1, 1985 to Sept. 30, 1986) covering about \$3 billion (at the farm level) in crops grown in 37 States.

As in the case of milk marketing orders, orders for fruit and vegetable growers are issued by the Secretary of Agriculture only after a public hearing where producers, marketers, and consumers may be heard, and after approval by vote of the producers.

After an order has been issued, the growers and handlers administer it through a committee made up of industry members and, in many cases, an additional member who is appointed to represent the public's interest. Their work is financed by industry assessments.

Most of the orders have quality and size regulations which make available for the fresh produce market the most desirable grades and sizes. Many have quantity regulations which prevent

gluts and shortages by keeping the commodity moving in orderly fashion throughout the marketing season. Some orders also have marketing research and development authority, which permits them to set up projects to find new market outlets to improve marketing, and to advertise and to promote consumption.

41. RESEARCH AND PROMOTION PROGRAMS

Research and promotion programs enable farmers to finance their own coordinated programs of research; producer and consumer education; and promotion to improve, maintain, and develop markets for their commodities and to solve production and marketing problems.

Laws have been passed authorizing research and promotion programs for beef, cotton, dairy products, eggs, floral products, honey, lamb, mohair, pork, potatoes, watermelon, and wool.

In general, once legislation is enacted, a proposed order is drafted by the industry and submitted to the Department of Agriculture. Then, depending upon the legislation, there could be public hearings, development of recommended and final decisions, and a producer referendum.

The promotion and research order for watermelon is in the developmental stage.

A promotion and research order for honey was issued July 21, 1986. It authorizes promotion and research projects to be funded through assessments on domestic honey producers and importers.

Separate promotion and research orders for beef and pork were implemented in 1986 to strengthen each product's position in the marketplace. The beef program is financed by a mandatory assessment of \$1 for each head of cattle sold in the United States and an equivalent amount on imported beef and cattle. The pork program requires an assessment of one-fourth of one percent of the market value of all hogs sold in the United States and an equivalent amount on imported hogs, pork, and pork products.

The beef order provides for a referendum after the program has been operational no longer than 22 months; pork producers will have an opportunity to vote 24 to 30 months after implementation of the pork order.

Under the cotton order, producers use provisions for research and promotion to try to expand markets for cotton and its products and to improve cotton's competitive position in domestic and international markets. Producers pay \$1 per bale plus an additional assessment of four-tenths of 1 percent of the

value of the cotton to finance advertising and promotion projects and to support research on production, processing, and marketing problems to develop and improve cotton products.

The order is administered by a cotton board composed of producer representatives selected by the Secretary of Agriculture from nominations made by cotton producer organizations.

More recent is the dairy promotion and research order implementing a national program for dairy product promotion, research, and nutrition education. This is a mandatory program financed by a nonrefundable 15-cent-per-hundredweight assessment on all milk sold by dairy farmers. In August 1985, producers voted to continue the program.

42. MARKETING IMPROVEMENT

The Federal-State Marketing Improvement Program, administered by USDA's Agricultural Marketing Service (AMS), is designed to solve problems at the State and local levels.

The Federal contribution to projects may equal as much as one-half of the project cost. In 1985, marketing improvement work was conducted under 17 projects in 15 States.

The projects covered improved marketability of agricultural products, domestic and international market development, economic and physical efficiency of marketing, improved marketing information, and studies of new marketing concepts such as electronic marketing.

The *Wholesale Market Development Program* conducts research to find new ways of improving the efficiency of handling and storing food products moving between the farmer and retail outlets. In particular, the program emphasizes the development and design of modern facilities that will contribute toward this goal of efficiency.

Design and feasibility studies are conducted to develop and/or modernize wholesale food distribution centers to serve major urban areas of the United States. Also, significant effort is directed toward the development and design of modern farmers' markets to serve as additional outlets for growers and a source for locally grown fresh farm products for direct sales to area consumers.

Studies are usually conducted at the request of food industry groups, growers, and local communities. Additional research is conducted under the program to find ways of improving specific food processing and warehousing activities as well as developing information, systems, and strategies useful to growers and handlers in increasing marketing efficiency. The Wholesale Market Development Program is located in AMS's

Market Research and Development Division.

The Food Quality Assurance (FQA) Branch of AMS's Market Research and Development Division has the responsibility for managing the specifications and coordinating quality assurance work for food purchased by the Federal Government.

FQA's goal is to make sure that the Government buys its food as efficiently and economically as possible. To accomplish this, FQA gathers and reviews all specifications used by the Government for a single food item; recommends changes to eliminate duplication, reduce complexity, improve clarity of language, and keep specifications current for Government needs.

FQA also approves final specifications used by all Government agencies and maintains a central file of all specifications used by the Federal Government to buy food.

43. AGRICULTURAL TRANSPORTATION

An efficient national transportation system is vital to effectively market farm and food products. Although the transportation system serving U.S. agriculture is highly developed, there are many complex and critical transportation issues that must be resolved for the system to work more effectively.

USDA's Office of Transportation (OT) consolidated transportation activities of several USDA agencies in December 1978 so that personnel, materials, and funds could be directed more efficiently to deal with agricultural transportation concerns.

Some of the issues the office is involved with are waterway user fees, the condition of rural roads and bridges, the impact on agriculture of rail and truck deregulation, and export promotion. OT also conducts technological research, often in cooperation with industry, on such projects as an experimental rail cattle car, a railway car using carbon dioxide snow for transporting frozen foods, and the development of new procedures for the air shipment of bees.

The Office develops agricultural and rural development transportation policies and programs. It represents the interests of agriculture and rural communities to regulatory agencies so that efficient and economical transportation services and facilities are available domestically and internationally. It also represents USDA in transportation discussions with other government agencies to plan for rural highways and other transportation facilities.

The Office provides information that considers the needs of rural communities and agriculture to Federal and State decision-makers involved in regulatory, policy, and legislative matters. It supplies technical assistance and information to farmers, shippers, carriers, and others about specific transportation needs

of agriculture and rural communities. OT identifies barriers and estimates adverse impacts on transport systems in agricultural and rural areas.

OT coordinates demonstration projects to improve national and international transport systems for agricultural products.

44. MARKET REGULATORY LAWS

Through its Agricultural Marketing Service, USDA administers and enforces regulatory laws that help make marketing more orderly and efficient.

The *Perishable Agricultural Commodities Act* establishes a code of trading ethics and encourages fair trading in the marketing of fresh and frozen fruits and vegetables. It prohibits unfair and fraudulent business practices and provides a forum to resolve contract disputes. Injured parties can collect damages from any buyer or seller who fails to live up to contract obligations.

The law also protects sellers of produce by imposing a trust on a buyer's inventory and receivables, which gives the seller a security interest in the product until payment is received.

The *Federal Seed Act* complements the seed laws of 50 States by prohibiting the interstate shipment of seed contaminated with excessive noxious weeds and requiring that all agricultural and vegetable seeds shipped interstate be truthfully labeled. It prohibits false advertising and prohibits seed imports of seed contaminated with noxious weeds.

The *Plant Variety Protection Act* extends patent-type protection to developers of plants which reproduce through seeds. Developers of new varieties of such plants as soybeans, wheat, corn, and marigolds apply to USDA for certificates of protection. USDA examiners determine whether the variety actually is novel and entitled to protection. The holders of certificates can turn to the courts to protect their "inventions" from exploitation by others.

The *Agricultural Fair Practices Act* enables farmers to file complaints with USDA if processors refuse to deal with them because they are members of a producer's bargaining or marketing association. This statute makes it unlawful for handlers to coerce, intimidate, or discriminate against producers because they belong to such an association. USDA helps to institute court proceedings when farmers' rights are found to be so violated.

Safe storage plays an important part in the orderly marketing of farm commodities because immediate sale is not always possible or advantageous.

Under the *U.S. Warehouse Act*, USDA operates a voluntary warehouse licensing system and a program of periodic examinations of licensed warehouses and their contents to help prevent deterioration and loss of stored products.

USDA also examines those warehouses that store goods owned by the Commodity Credit Corporation and on which CCC loans have been made.

45. MARKET NEWS

The Federal-State market news service, carried out by USDA's Agricultural Marketing Service (AMS) in cooperation with 44 State agencies, the District of Columbia, and 3 territories, reports up-to-the-minute information on prices, supply, and demand for most agricultural commodities.

This information aids producers, wholesalers, and others in the marketing chain in deciding where and when to buy or sell. The industry voluntarily provides the information on which market news reports are based.

Almost anywhere and any time trading in farm products goes on, Federal-State market news reporters are at work providing information about market conditions to the agricultural community.

Market news reporters gather data during visits to trading points and by telephone on qualities and quantities of the products sold, the prices paid, the demand, the movement, and the trends. From this information they develop timely, accurate, unbiased market reports for practically all agricultural commodities. They continually gather this information throughout every trading day. And they get it out promptly to the waiting public.

The reports cover buying and selling of these commodity groupings: cotton and cottonseed; fruits, vegetables, floral products, and specialty crops; livestock, meat, grain, hay, feeds, and wool; and tobacco.

AMS utilizes satellite communication, earth stations, and microcomputers to compile 700 to 900 market news messages and reports each day. This totals approximately 1 million characters of information transmitted by satellite among approximately 140 electronic "drops" across the country daily.

News from California can be available in New York and points in between in only minutes after it is released.

Automatic telephone answering devices are also used to disseminate market news. In 44 States a farmer or trader can dial a local number and receive a recorded message—updated several times a day—with the latest market news reports for a particular commodity in a specific area.

Market news reports also find their way into newspapers and magazines, radio and television, bulletin boards, and printed reports that are available on subscription.

Market news reporters gather and document information through personal observation of the transaction, talks to buyers and sellers, and checks on sales records. They must make sure that an accurate picture of the market is given because many people rely on their reports.

Some AMS offices use electronic recording systems to capture, process, and store the information. For example, such a system is used to process data about the 10 to 13 million samples of cotton classed each year.

Like their fellow employees in standardization and grading work, market news reporters have to be experts on the commodities covered. For even if the product is not officially graded, the reporter must often report prices paid for the various qualities of products in terms of the nationally understood language, U.S. grades.

Only in this way can prices, supply, and demand be realistically compared from day to day and from market to market throughout the country.

Farmers and others who buy and sell farm products need to make these comparisons. They need market news in making decisions on how much and what kind of product to grow, on where and when to market, on whether or not to accept a price bid.

This information helps to keep the marketing channels filled but not overflowing, preventing unnecessary and wasteful gluts and shortages, and helping provide consumers with a reliable and reasonably priced supply of foods to meet their daily needs.

Market news reports may help an Iowa hog grower, for instance, decide whether to ship the hogs to a terminal market, sell them at a nearby auction or direct buying station, or hold back for a few days if a heavy run is reported. Market reports in the local newspaper or on radio or television were likely provided by the Federal-State market news reporter.

Similar stories could be told about the need for market news for every other important farm commodity—and how this need is being met by the market news services.

Market news services are operated cooperatively with State departments of agriculture, or in the case of cotton, a price quotations committee. AMS provides the centralized direction and coordination so necessary to achieve nationwide uniformity and make the market news reports useful throughout the country.

46. FEDERAL GRADING PROGRAMS

USDA grade standards and grading services for food and farm products provide buyers and sellers with an impartial appraisal of the quality of what is being sold. The buyer has the right to expect a particular quality from USDA Choice beef, USDA Grade A eggs, or any other USDA graded product. Likewise, the seller has the right to expect a price for the product commensurate with its quality.

Two USDA agencies—Agricultural Marketing Service and Federal Grain Inspection Service—provide voluntary grading services for most food and farm products.

Grading is often provided in cooperation with State departments of agriculture, and the users—usually packers or processors who request the service—are charged a fee for it.

During Fiscal Year 1986, USDA graded 57.6 percent of the total beef production in the United States, 45 percent of the total fresh fruits and vegetables, 42 percent of the shell eggs going to consumers, 62.5 percent of the butter, 55 percent of the frozen fruits and vegetables, 35 percent of the canned fruits and vegetables, 93 percent of the turkeys, and 72 percent of the chickens and other poultry.

USDA also classed 97 percent of the cotton and inspected 95 percent of the tobacco produced in the United States.

USDA grade standards are continually appraised by experts so that they remain realistic. Each year about 7 percent of the standards for about 400 food and farm products are revised to keep them consistent with current marketing practices. In addition, new standards are developed as the need arises.

The number of grades for a particular product depends on its variability. It takes eight grades to cover the quality levels in beef, but only three for turkey.

Grading is used more often at the wholesale level than at the consumer level. Grade labeling of food products is not required by Federal law.

47. FEDERAL GRAIN INSPECTION

The Federal Grain Inspection Service (FGIS) was established in 1976 as a separate agency in USDA. Its primary task is to carry out provisions of the U.S. Grain Standards Act. The agency is mandated by Congress to establish a nationwide system to assure integrity in the inspection, weighing, and handling of U.S. grain, both at interior and export locations.

The orderly marketing of grain requires uniform descriptions that are understood and accepted by buyers and sellers. To

meet this need, official U.S. standards have been developed for 11 grains: corn, wheat, rye, oats, barley, flaxseed, sorghum, soybeans, triticale, sunflower seeds, and mixed grain.

Standards are reviewed and revised when necessary to meet current marketing needs and practices.

Most grain for export must be officially weighed. It must also be inspected for quality if it is marketed under a U.S. grade. The inspection and weighing of export grain must be performed by FGIS personnel, or licensed employees of eight States that have been delegated this authority.

For grain that is handled at inland locations or sold in the domestic market, private firms and State agencies are designated to provide official inspection service under FGIS supervision. Such inspection is provided on a request basis. Official weighing is authorized on a request basis for grain that is being sold in the domestic market.

Fees for inspection and weighing are paid by the users of the services. Buyers or sellers in either export or inland markets who are not satisfied with the grades they receive can appeal the inspection results.

In addition to the inspection and weighing of grain, FGIS is also responsible, under the Agricultural Marketing Act of 1946, for inspection and weighing of rice, dry beans, peas, lentils, processed grain products, hops, and other assigned agricultural commodities. These services are available on a request basis. Fees for the inspection and weighing services are paid by the users of the services.

48. MEAT, POULTRY, AND LIVESTOCK MARKETING REGULATIONS

The Packers and Stockyards (P&S) Act, administered by USDA's Packers and Stockyards Administration (P&SA), regulates marketing practices in the livestock, poultry, and meat industries. Specifically included are livestock markets (terminal and auction markets), livestock market agencies, livestock dealers, meat packers and live poultry dealers and handlers.

The law prohibits unfair, deceptive, discriminatory, and monopolistic trade practices in regulated industries. It also provides financial protection for livestock producers.

The P&S Act encourages fair and open competition in the marketing of livestock, poultry, and meat to assure that true market value is received. Livestock markets, buying stations, dealers, packers, and poultry processors subject to the act must maintain accurate scales and weigh livestock, poultry and meats accurately.

49. FARMER COOPERATIVES

Four out of every five commercial farmers use cooperatives for one reason or another to market their products, provide their supplies, and procure needed services.

Farmers have large investments in all types of cooperatives. The Balance Sheet of the Farming Sector shows farmers' equity in these agriculturally related businesses was \$27.7 billion at the beginning of 1986, down 7 percent from the preceding year. The average cooperative investment per farm is \$13,000.

The Agricultural Cooperative Service (ACS) surveys farmer cooperatives each year to measure business activity.

Statistics for 1985 show that 5,625 cooperatives transacted a business volume of \$64.3 billion (excluding intercooperative business), down 12 percent from the record high of \$73 billion in 1984. Net income was \$767 million, down from \$1.01 billion in 1984. Memberships totaled 4.8 million, indicating many farmers belong to more than one cooperative.

California leads all States in cooperative business volume with \$5.8 billion. Iowa is second with nearly \$5.7 billion, and Minnesota third with \$5.4 billion.

Minnesota leads all States in number of cooperatives and memberships, with 566 cooperatives and 423,983 memberships. North Dakota is second in number of cooperatives with 391 and Texas is third with 387. Iowa is second in number of memberships with 310,023 and Wisconsin is third with 308,491.

Farmers market 31 percent of their raw products and, to varying degrees, process and package products through cooperatives.

Dairy products lead in volume of cooperative marketing business, with \$15.4 billion. Grain and soybean products are second with \$15.3 billion, fruits and vegetables third with \$5.1 billion, and livestock products fourth, with \$3.3 billion. Other products totaling 1 or more billion dollars were: cotton products, \$1.6 billion; and sugar products, \$1.5 billion.

Total marketing volume in 1985 was \$46 billion, down 15.6 percent from 1984.

ACS estimates that about 27 percent of the major farm supplies bought by farmers are purchased from cooperatives. ACS figures for 1985 show cooperatives handled supplies totaling nearly \$16.6 billion.

Petroleum products are the leading farm supply item purchased at \$5.8 billion. Fertilizer accounts for \$3.3 billion and feed for \$3.1 billion. Farmers obtained more than \$1.6 billion worth of farm-related services through cooperatives.

ACS provides research, management analysis, and technical

and educational assistance to cooperatives to strengthen the economic position of farmers and other rural residents. It works directly with cooperative leaders and Federal and State agencies to improve organization, leadership, and operation of cooperatives and to give guidance to further development.

ACS (1) helps farmers and other rural residents develop cooperatives to obtain supplies and services at lower cost, and get better prices for products they sell; (2) helps cooperatives improve services and operating efficiency; (3) informs members, directors, employees, and the public on how cooperatives work and benefit their members and their communities; and (4) encourages international cooperative programs.

ACS also publishes research and education materials and issues the publication, *Farmer Cooperatives*.

VI. CONSERVATION: SOIL, WATER, TREES

50. SOIL AND WATER CONSERVATION

Soil Erosion Rate

Estimated average annual erosion from the Nation's farmland and other non-Federal lands is more than 6.5 billion tons of soil, according to the Soil Conservation Service (SCS). Of this total, about 1.1 billion tons erode from streambanks, gullies, construction sites, roads, and roadsides.

In many areas, the rate of erosion seriously threatens long-term agricultural productivity. Erosion rates exceed tolerable levels on 299 million acres of cropland, pastureland, forest land, rangeland, and other rural lands. Scientists consider erosion tolerable when eroded topsoil can be replenished through natural processes.

Of the more than 6.5 billion tons of soil losses from wind and water erosion each year, more than 5.4 billion tons erode from rural land.

The greatest soil losses are on cropland, which is sustaining an estimated annual soil loss of 3 million tons. Of the 421 million acres of cropland, 185 million acres (44 percent) is eroding at greater than tolerable rates. About 60 million acres (14 percent) of the Nation's cropland is eroding at rates exceeding three times the tolerable level.

Sediment, the greatest single water pollutant by volume, is an end product of soil erosion.

Fighting Erosion with Conservation Systems

Fortunately for the future of America's farmlands, many practical systems are available for controlling soil erosion. More than 2 million landusers have signed up with local conservation districts to apply conservation measures on their farms and ranches.

Technical help comes from the SCS, and cost sharing from SCS and the Agricultural Stabilization and Conservation Service (ASCS).

Among the most successful techniques for erosion control are various forms of conservation tillage, in which residue from a previous crop is left in the field. The ultimate conservation tillage system is no-till. This system leaves virtually all of the previous crop residue mulch on the soil surface on a year-round basis. Where feasible, no-till farming reduces erosion to negligible rates.

The National Association of Conservation Districts' (NACD) Conservation Technology Information Center in Fort Wayne, Indiana, encourages greater use of conservation tillage on American farms. USDA, the agribusiness sector, and other organizations help the Center with its work.

During Fiscal Year 1986, SCS provided assistance to more than 4,000 new district cooperators. SCS assisted 972,411 individuals, groups, and units of government. Individuals and groups applying conservation practices totaled 390,938. SCS provided conservation plans on more than 13 million acres.

SCS gives technical assistance to farmers, ranchers, other individuals and groups, and local and State governments to reduce erosion and sedimentation, conserve water and improve water quality, reduce energy requirements, and plan better land and water uses. SCS provides help largely through some 2,950 local conservation districts that are organized under State law by local people.

In addition to direct help to landowners and operators, SCS has USDA leadership for the National Cooperative Soil Survey. The Service also helps reclaim abandoned mines and provides conservation assistance to current mining operations.

SCS provides technical and financial assistance to sponsoring groups in planning and installing small watershed protection projects under Public Law 566 and related acts. The agency also participates in various river basin surveys and investigations, provides flood hazard information for communities, and helps in postflood restoration work on streams and rivers.

SCS has leadership with USDA for the Resource Conservation and Development Program; for the Great Plains Conservation Program, which provides long-term financing and conservation assistance in parts of 10 States; and for conducting snow surveys in cooperation with other Federal, State, and private agencies involved in water supply forecasting in the West.

The Service assists schools in planning and building outdoor conservation classrooms and helps environmental and wildlife groups with natural resource projects. It also finds new strains or adapts grasses, legumes, shrubs, and trees for a wide range of conservation uses, including increased protection and production of pasture and range; windbreaks; wildlife food and cover; protection of streambanks and shorelines; highway rights-of-way; and reclamation of surface mined land.

51. CONSERVATION AND FARM LAW

The Food Security Act of 1985, amending basic farm laws, included some landmark conservation provisions that will help

reduce excessive erosion on agricultural lands. Three key provisions of the act deal with the conservation program, highly erodible land, and wetland conservation.

Interim rules to implement the highly erodible land and wetland provisions were issued by USDA on June 23, 1986. Under these rules, the Soil Conservation Service (SCS) is responsible for identifying highly erodible lands, wetlands, and converted wetlands, and for helping land users plan and apply conservation systems to maintain their eligibility to participate in certain USDA programs.

The criteria used to identify erodible lands is based on an erosion potential value of eight or more which considers only the inherent characteristics of the soil to resist the forces of water or wind erosion, not the practices or management applied by man which may vary from year to year. Under this criteria, 118 million acres of cropland and 227 million acres of noncropland that have a potential to be converted to cropland in the future are designated as highly erodible.

Noncropland brought into production of an agricultural commodity after December 23, 1985, must have an approved conservation system in place prior to each production if a producer is to maintain his eligibility for certain USDA program benefits.

On existing cropland, a producer must be actively applying an approved conservation plan by January 1, 1990, and have the plan fully implemented by January 1, 1995, in order to maintain eligibility for USDA program benefits.

The wetland criterion is identified as those hydric soils that produce hydrophytic vegetation. It is estimated that 5 million acres of agricultural lands will meet this criterion.

If these acres are converted for the production of an agricultural commodity after December 23, 1985, the participant will lose his or her eligibility to participate in certain USDA programs.

52. CONSERVATION RESERVE PROGRAM

The Food Security Act of 1985 authorizing the *Conservation Reserve Program* (CRP) was signed by the President on December 23, 1985. The program was operational with the first sign-up conducted March 3-14, 1986, followed by two other sign-ups in May and August.

Through CRP, the Soil Conservation Service (SCS) provided technical assistance to nearly 69,000 farmers who have entered into contracts with the Secretary of Agriculture. These contracts will convert 8.8 million acres of highly erodible cropland to

grass, trees, or wildlife cover. This means that 22 percent of the planned 40 million acre program has been achieved.

Establishment of cover on land now included in CRP contracts will reduce the estimated annual rate of erosion by 27 tons per acre per year from these lands.

CRP contracts will be accepted through 1990 during future sign-up periods.

The Conservation Reserve Program's purpose is to conserve and improve soil and water resources on cropland classified as "highly erodible." Farmers participating in the program sign a 10-year contract with USDA, agreeing to take the eligible land out of production and establish a protective cover of perennial grass, wildlife plants, windbreaks or trees. In return, USDA provides annual rental payments, in cash or commodities, for the land removed from cultivation and covers half the expense of establishing the permanent cover on the land. The farmer implements a conservation plan for the land.

Planning and technical assistance is provided by the SCS, conservation districts, Forest Service, State forestry agencies, and others. During the contract period, farmers may not reap commercial benefits from the land under the Conservation Reserve Program through haying, grazing, or seed or tree production.

53. AGRICULTURAL CONSERVATION PROGRAM

The *Agricultural Conservation Program (ACP)*, administered by the Agricultural Stabilization and Conservation Service (ASCS), provides for cost-share assistance to farmers and ranchers in carrying out measures to prevent soil loss from wind and water erosion, solve water conservation and water quality problems, enhance forest resources, and treat other natural resource problems.

The program stresses solving local environmental problems. Local authority under the program is delegated to the county ASC committee, which consults with the county conservation review groups to develop practices to solve soil and water conservation problems, prevent pollution, and conserve energy. Included are Federal and State agencies and other organizations interested in soil and water conservation and other environmental problems.

The Soil Conservation Service and the Forest Service provide technical program guidance to ASCS committee members and technical assistance to farmers in carrying out conservation practices. If a conservation practice is approved, the Government will bear part of the cost of conservation work, while the

farmer bears the balance. Special program provisions provide for an increased cost-share rate for low-income farmers.

54. EMERGENCY CONSERVATION PROGRAM

The *Emergency Conservation Program (ECP)*, managed through the Agricultural Stabilization and Conservation Service (ASCS), provides emergency funds for sharing with farmers and ranchers the cost of emergency conservation measures needed to rehabilitate farmland damaged by floods, hurricanes, tornadoes, or other natural disasters, and for carrying out emergency water conservation measures during periods of severe drought.

A farmer or rancher who qualifies may receive up to 64 percent of the cost of the measures. Subject to availability of funds, the ASC county committee in consultation with the State ASC committee and the Area office is authorized to implement the ECP for eligible farmers and ranchers when the damage is so costly to repair that Federal assistance is needed to return the land to productive agricultural use.

55. THE WATER BANK PROGRAM AND THE RURAL CLEAN WATER PROGRAM

Two other Federal programs having to do with water under farm or ranch management have quite different objectives, although both are intended to improve water quality.

The *Water Bank Program* is available to farmers or ranchers having specified types of wetlands along major migratory waterfowl flyways. The Agricultural Stabilization and Conservation Service (ASCS) operates the program primarily along the northern part of the Mississippi River and along north-south flyways.

The program is designed to preserve and improve migratory waterfowl and other wildlife habitats; preserve and improve wetlands; conserve surface waters; reduce runoff, soil erosion, and stream sedimentation; contribute to flood control, better water quality, and improved subsurface moisture; and accomplish related conservation and environmental objectives.

Eligible persons may enter into 10-year agreements, with provision for adjustment of rental rates the fifth year of the agreement, and for renewal at the end of the 10-year period. Owners and operators receive annual payments in return for agreeing to protect and improve wetlands.

ASC county committees administer the program. Planning and technical services are provided by the Soil Conservation Service (SCS).

The Rural Clean Water Program (RCWP), also administered by ASCS, is an experimental program designed as a cooperative endeavor to develop and test policies, procedures, and methods for controlling agricultural nonpoint sources of pollution.

This program treats specific types of water quality problems; that is, runoff containing nutrients and/or pesticides, animal waste, leachates, irrigation return flows, and sediment.

This voluntary program provides long-term financial and technical assistance to owners and operators of privately held agricultural land in selected project areas who install conservation measures to control water pollution.

SCS is responsible for coordinating technical assistance provided in the RCWP.

56. GREAT PLAINS CONSERVATION PROGRAM

The region known as the Great Plains contains important grazing lands and cropland, including vast acreages of wheat. Located in 10 States, it is an area of light and fragile soils, relatively low rainfall, and periodic drought and dust storms.

In 1956, Congress established the Great Plains Conservation Program (GPCP) to help stabilize the agriculture of this vast area. The program helps land users change their farm and ranch operations to mitigate natural hazards of the Great Plains, such as those related to climate, soil, topography, floods, and salinity. The changes include measures for erosion control, water conservation, and land use adjustment.

Under the program, a participating landowner or land operator:

- Works out a conservation plan and schedule;
- Contracts with USDA to apply all the conservation work in from 3 to 10 years;
- Gets technical help from the Soil Conservation Service (SCS), as needed; and,
- Receives from the Federal Government a portion of the cost of each conservation step as the landowner or operator completes it.

In 1986, 946 farmers and ranchers signed long-term contracts to apply conservation measures on more than 2.2 million acres.

The program is available to farmers and ranchers in 518 counties in the 10 States: Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming.

The GPCP is coordinated with other Federal, State, and local governmental agencies. It is intended to be an addition to, and not a substitute for, other programs available in the Great Plains area.

In 1980, Congress extended the GPCP to September 30, 1991.

57. FOREST MANAGEMENT

Studies show that future demands for timber are likely to rise more rapidly than supplies, resulting in increasing costs for housing and other wood products. Forest management programs of the U.S. Department of Agriculture are designed to help meet the rising demand for wood products and other forest goods and services.

USDA's Forest Service (FS) administers 191 million acres of National Forests and National Grasslands. It cooperates with State foresters in providing advice on forest management and use to non-Federal owners of forested lands and wood processors, and conducts research to support these activities.

The Agricultural Stabilization and Conservation Service (ASCS), in cooperation with the Forest Service and State forestry agencies, provides cost-sharing with private landowners for woodland management practices.

The Soil Conservation Service (SCS) assists private landowners in developing conservation plans for all land uses, including forest lands. Through such programs as the Agricultural Conservation Program, the Conservation Reserve Program, and the Small Watershed Program, USDA further recognizes the importance of America's woodlands in assuring conservation and enhancement of the Nation's natural resources and a quality environment.

America's forest lands occupy about 740 million acres, one-third of the Nation's 2.3 billion acres of land. The National Forests occupy 191 million acres, including 97 million acres, or 20 percent of the country's 483 million acres of commercial forest land, and contribute 20 percent of the Nation's total annual timber harvest.

Industry owns 14 percent of those 483 million acres, contributing 30 percent of the national timber harvest. Nine percent is in other public lands which provide about 10 percent of the national timber harvest. But most of the forest land in the Nation, 58 percent, is controlled by about 7.7 million nonindustrial private owners. These private lands contribute 40 percent of the national timber harvest.

In 1977, about 45 percent of the Nation's timber harvest came from the South, 30 percent from the Pacific Coast, and 25 percent from the North and Rocky Mountain areas. The South is expected to be the major timber producer in the future.

The Forest Service is responsible for controlling forest insects

and diseases directly on the National Forests, in cooperation with other Federal departments on other Federal lands, and in cooperation with State foresters or equivalent State officials on State and private lands in the United States.

Through its forest pest management program, the Forest Service surveyed 556 million acres of forested lands of all ownerships in 1985, to detect and evaluate pest problems in their early stages.

Through cooperative programs with the States, the Forest Service provided 134,338 "assists" to woodland owners in 1985. Assistance in tree planting, seeding, timber stand improvement, and other woodland activities affected some 914,664 acres of timberland.

State nurseries distributed 733 million seedlings for use in forest and wind barrier plantings. USDA funds helped survey 566 million acres of forest for insect and disease infestation, and over 833 million acres were protected from fire with shared USDA funds.

Private forest landowners also improved the recreational potential on 193,000 acres, and wildlife habitat on 431,000 acres. Fifty-three thousand forest management plans were prepared. In addition, 1,014 acres of critically eroding area were stabilized by tree planting; 41 acres of surface-mined areas were stabilized; and 19 miles of firebreaks and fuel breaks were constructed on critical watersheds.

The *Forestry Incentives Program* (FIP) is jointly administered by the ASCS and the Forest Service (FS) in cooperation with State forestry agencies.

FIP authorizes the Federal Government to share with private landowners the cost of planting trees and improving timber stands. The Federal share of these costs can be up to 65 percent.

Participation in the program is limited to landowners with a maximum of 1,000 acres of forest land, although exceptions can be granted at the discretion of the Secretary of Agriculture for ownerships of up to 5,000 acres.

FIP is available in counties designated on the basis of a FS survey of total eligible nonindustrial private timber acreage that is potentially suitable for production of timber products. In 1985, 207,000 acres were treated under FIP.

From the beginning of the program in 1975 through fiscal year 1986, 92,000 private landowners entered into cost-share agreements with ASCS under FIP. These agreements called for 1.8 million acres of tree planting and for 1.0 million acres of timber stand improvement. All practices were certified by State foresters.

The Forest Service assists State foresters in organizing, training, and equipping local fire fighting forces to protect lives, crops, livestock, farmsteads, and other resources in rural areas and rural communities. State foresters are also encouraged to make use of Federal excess personal property to protect non-Federal lands.

In 1985, the *Cooperative Fire Protection Program* suppressed 71,502 fires that burned 3,200,198 acres of protected wildlands.

The annual harvests from the National Forest System are carefully calculated to assure continually productive forest lands. In fiscal year 1985, about 10.9 billion board feet of timber were harvested under strict conservation regulations contained in timber sale contracts.

Returns from these timber sales were \$720.6 million. As provided by law, 25 percent of all National Forest income is returned to the States containing the forests from which the income was derived; in fiscal year 1985, this amounted to more than \$212 million.

Under the Multiple-Use Sustained Yield Act of 1960, these forests must be managed so as to yield a wide range of other social goods and services, including recreation, watershed benefits, livestock grazing, and wildlife habitat.

On National Forest lands, the Forest Service in 1985 planted and seeded 206,741 acres, and improved 279,881 acres of young timber by thinning and release from vegetative competition.

On the National Forests, 12,000 wildfires were controlled, limiting damage to 663,756 acres burned.

The National Forests and Grasslands are home to more than 4 million big game animals and 139 species of threatened or endangered wildlife. In fiscal 1985, 1.4 million head of cattle and 1.2 million sheep and goats grazed on National Forests and Grasslands under special permits granted to ranch operators.

In addition to sale of timber, income in fiscal year 1985 was \$9 million from grazing fees, \$140.4 million from mineral receipts, and \$30.8 million from recreation and user fees.

The National Forests contain 32.2 million acres of wilderness, about 36 percent of the total National Wilderness Preservation System.

At sites operated by eight forest experiment stations and the Forest Products Laboratory, research projects covering forest management, protection, and utilization are underway.

Subjects being investigated include forest genetics and cultural practices to increase yield, control of insects and diseases, suppression of wildfires and beneficial use of fire in forest management, wildlife and fish habitat improvement, recre-

ation, snowpack control and other watershed considerations, environmentally sound harvesting techniques, timber processing techniques to increase yield, use of low-quality or residual wood, protection of wood products from natural degradation, improvements to housing through energy conservation or lumber-saving designs, and urban forestry.

Research findings are made available to the public through publications and the efforts of the Forest Service's State and Private Forestry arm to put innovations into practice.

VII. AGRICULTURAL PLANNING, PRODUCTIVITY, AND PROTECTION SERVICES

58. NATIONAL AGRICULTURAL STATISTICS

An orderly production and marketing system depends on an accurate and current accounting of potential output, available stocks, and the other factors that influence agriculture.

The National Agricultural Statistics Service (NASS), through its Washington, D.C., headquarters and 44 field offices serving all States, annually publishes hundreds of reports detailing production and prospects for crops, livestock, dairy, and poultry. Other releases outline stocks, prices, labor, weather, and similar items concerning farmers and ranchers and those associated with agriculture.

Geared toward producers, this information can help them plan their planting, feeding, breeding, and marketing programs. The data also are used by agricultural services and businesses, trade groups, and financial organizations to determine needed inputs, resources, transportation, and storage related crop and livestock products.

Information for these continuing series of estimates is gathered from those most closely involved, the producers. Contact is made by mail survey and telephone and personal interview. For such major crops as corn, cotton, wheat, and soybeans, special on-the-spot counts and measurements of plant development are made in a cross-section of fields throughout the Nation.

All the raw indications from these varied sources are summarized by the NASS office serving that State and sent to the agency's Agricultural Statistics Board in Washington, D.C., which sets and issues the official estimates for the State and Nation.

All reports are released at scheduled times, and the information is readily available to the public through the Agricultural Statistics Board and the Government Printing Office. (Also see Appendix V on Computerized information.)

59. FEDERAL AGRICULTURAL ECONOMICS RESEARCH

USDA's Economic Research Service (ERS) does research and analysis covering various topics related to agriculture and rural America. Production and marketing of major commodities is one area of study. Analysts make projections for supply,

demand, and use of specific crops, dairy products, or livestock. They predict farm income and food prices.

Another major area of research is foreign agriculture and trade. Economists assess foreign developments and agricultural policies to determine their impact on U.S. foreign agricultural trade.

Use, conservation, and development of natural resources as they affect economic growth are also covered.

ERS economists examine rural population, employment, and housing trends, and rural people's economic adjustment problems.

Performance of the agricultural industry, including the production, processing, and marketing sectors, is another important area that is routinely assessed by ERS.

60. NATIONAL AGRICULTURAL INFORMATION

The free world's largest collection of books and periodicals on agriculture and related subjects is housed at the National Agricultural Library (NAL) in Beltsville, Md.

The library's collection consists of 1.8 million books, journals, and other materials on technical agriculture, farming, veterinary science, entomology, botany, chemistry, soil science, food and nutrition, agricultural products, rural sociology, and economics.

Information is made available to a wide variety of individuals and groups around the world through State land-grant university libraries, agricultural experiment stations, State Extension services and education departments, public and private libraries, and business and industry.

Scientists, administrators, researchers, nutritionists, teachers, and many others receive technical information from the NAL collection through these channels as well as by direct inquiries to the library.

Fast, efficient distribution of information is provided through automated information retrieval services.

Agricultural On-Line Access (AGRICOLA) is the master data base, with 2.5 million records dating from 1970. It provides comprehensive, worldwide coverage of the published literature on agriculture and related subjects as represented in the collections of the NAL.

Subfiles cover economics, animal health, environmental impact, energy, food and nutrition, 4-H, and Extension. Through on-line commercial vendors, the base is available to the public, both domestically and internationally.

Current Awareness Literature Service (CALIS) offers computer searches of current literature to USDA scientists and

researchers on a reimbursable basis. Searches are based on 12 areas of interest, as specified by the requesting scientists and technicians.

General reference services are provided in the reading room or may be requested in person, by mail, or by telephone (301) 344-3756; TWX (710) 828-0506 USDA, NAL; and telefacsimile (301) 344-3675.

Translations of foreign-language publications are available on request to USDA personnel and other agricultural researchers and Extension workers.

Specialized information centers offer selective, in-depth coverage on major agricultural topics including alternative farming systems, animal welfare, aquaculture, biotechnology, critical agricultural materials, family, fiber and textile, food and nutrition, food irradiation, and horticulture.

Subject-oriented centers provide information resources on current topics of concern to the government and the public. User services range from reference and referrals to production of specialized bibliographies and computer database searches.

Document Delivery Service is available to USDA employees in response to job-related requests. Photocopies rather than a loan of journal articles are supplied. The Library will also lend books to other libraries within the provisions of the National Interlibrary Loan Code, 1980. Photocopy or microfilm copy of documents may also be ordered by non-USDA employees at a minimum charge.

The National Agricultural Library conducts orientation and training programs upon request for USDA employees interested in learning how to use the library and its services. Orientation and training programs for agricultural and library students and other groups tailored to special needs and interests should be requested in advance. Programs can be arranged by telephoning (301) 344-3778.

61. COOPERATIVE EXTENSION SYSTEM

As a national educational network, the Cooperative Extension System links research, science, and technology to the needs of people where they live and work. The Extension Service (ES) is the educational arm of the U.S. Department of Agriculture and Federal partner in the Cooperative Extension System.

The Cooperative Extension System is comprised of USDA's Extension Service; the 1862 land-grant State or other universities in 50 States, Puerto Rico, the Virgin Islands, Guam, American Samoa, Micronesia, and the District of Columbia plus 16 1890 land-grant universities and Tuskegee University as the

State partner; and more than 3,150 county offices representing local governments as the other partner.

The land-grant universities were established by the Morrill Acts of 1862 and 1890. All three partners of the Cooperative Extension Service share in financing, planning, and conducting Extension's educational programs.

This nationwide network and resource of professional staff and community volunteers is a unique and integrated partnership involving Federal, State, and county governments; research; agribusiness; and the private sector. The network does the following:

- Provides nationwide leadership in adapting and transferring science and technology.
- Anticipates and responds educationally to critical national issues affecting the food and agricultural system.
- Mobilizes resources to respond to natural disasters and catastrophes.
- Initiates targeted educational programs necessary for implementation of Federal regulations and policies.
- Develops a cadre of about 3 million volunteers prepared to serve the Nation, the State, and the community.

The Extension System's educational programs are designed to access and apply USDA and university-generated knowledge and research to critical issues in every State and county in the United States. Current national issues being addressed include restoring profitability in agriculture through improved management; improving diet, nutrition, and health; managing soil, water, and other natural resources; developing human capital and resources; transferring relevant new technology; and revitalizing rural areas.

USDA's Extension Service has a small professional staff that provides national-level policy formulation; program leadership, management, organization, coordination, and representation; and accountability and evaluation systems in support of the Cooperative Extension System.

The State Cooperative Extension Services at the land-grant universities have professional staff at the State, area, and county level. These staffs work together to assess clientele needs and develop results-oriented educational programs to assist farmers, families, individuals, and communities in developing problem-solving and decisionmaking skills.

Extension staff at all levels apply new communication technologies, including computers, video, satellites and teleconferencing, in developing and delivering educational programs to people.

Through this strong, responsive partnership, the Cooperative

Extension System maintains a corps of competent professional staff throughout the Nation, a staff that understands local conditions and anticipates and responds to the needs of the food and agriculture system and of rural America as they arise.

The national Cooperative Extension System also assures citizens access to research findings and information from anywhere in the Nation.

62. AGRICULTURAL RESEARCH

Agricultural research provides new knowledge and technology to ensure an adequate supply of food and fiber for the Nation's population now and in the future. A basic goal of agricultural research is to establish a high-yielding agriculture that also supports a quality environment and conserves energy and natural resources.

Research has given farmers more control over nature, increased production, reduced production risks, and increased marketing efficiency. Research has led to the following:

- Genetically improved high-quality pest-resistant varieties of crops.
- Maintenance of an efficient and competitive agriculture in world trade, and improvement in U.S. capability for export of agricultural commodities.
- Development of new crops and of new uses for crops.
- Improved methods for conserving natural resources.
- Genetically improved livestock with higher reproduction rates.
- Efficient control of diseases, insects, nematodes, weeds, parasites, and other pests, including control of insects affecting humans and stored products.
- Control of livestock diseases and prevention of introduction of exotic diseases.
- Improved control of insects, ticks, and mites that affect livestock.
- Better plant and animal nutrition.
- Better nutritional quality in foods and added food safety.
- Improved irrigation equipment, principles, and practices.
- Improved farm equipment and mechanization practices.
- More efficient processing, transporting, and marketing of food.
- New and better fibers and fabrics.
- Improved levels of rural living.
- Support for programs of action and regulatory agencies.

The responsibility for much of the public segment of the agricultural research and development program lies with the

Agricultural Research Service (ARS) of the U.S. Department of Agriculture and the land-grant college system of State agricultural experiment stations (SAES).

The interrelated and cooperative programs of USDA and SAES cover research locations in all 50 States and in the District of Columbia, Puerto Rico, the Virgin Islands, Guam, American Samoa, Micronesia, and the northern Marianas.

The primary intramural research agency of USDA, ARS, is committed to a balanced program of fundamental and applied research that concentrates on problems that are high risk, long range, and are national or regional in scope.

The ARS program plan defines six major objectives that develop the means for the following:

- (1) managing and conserving the Nation's soil and water resources for a stable and productive agriculture;
- (2) maintaining and increasing the productivity and quality of crop plants;
- (3) increasing the productivity of animals and the quality of animal products;
- (4) achieving maximum use of agricultural products for domestic markets and export;
- (5) promoting optimum human health and well-being through improved nutrition and family resource management; and
- (6) integrating scientific knowledge of agricultural production, processing, and marketing into systems that optimize resource management and facilitate transfer of technology to users.

The ARS program plan will ensure that USDA research complements and supports, rather than duplicates, efforts of other organizations within the agricultural research system.

Current agricultural research priorities are designed to meet the challenge of doubled food production, necessary if population forecast for the year 2000 is to be fed. These priorities include research on the following:

- *Developing new and improved plant varieties.* Scientists are identifying growth processes through the use of cell culture and are trying to improve plants and animals by genetic engineering. They are also using more conventional plant breeding and genetic techniques, and are developing new hormonal or regulator control of plant and animal growth.
- *Improving animal reproductive efficiency.* Progress is being made toward improved reproductive efficiency of meat and dairy animals, including twinning and multiple births in cattle. The potential for increased reproductive rates is estimated at 100 percent.
- *Increasing animal production efficiency.* Scientists are investigating ways to make maximum use of livestock feedstuffs

such as forages and concentrates. In addition, research to exploit gene transfer through the use of recombinant DNA molecules may increase the value of animals as food. Research on methods to prevent, control, or eliminate infectious diseases, internal parasites, and external parasites such as insects, ticks, and mites can significantly increase the efficiency of livestock production.

- *Plant germplasm use and preservation.* Unique collections and repositories of information and materials, developed and maintained by ARS, are essential in meeting national research needs, and are heavily used by other public and private research organizations. They include facilities for plant germplasm introduction and preservation, clonal repositories, disease-free seed stock, the ARS Culture Collection, and taxonomic collections of plants, microbes, and insects. Germplasm variability is imperative if breeders are to develop new, unique, productive crops for ensuring a stable, plentiful supply of food, feed, and fiber with desirable quality.
- *Removing barriers to crop productivity.* Barriers to increased production of major domestic and export crops are being removed through the development of stress-tolerant varieties. Crop and soil management systems and weather data systems have been improved to facilitate agricultural decision-making, and to use plant nutrients from fertilizers and organic materials more efficiently.
- *Conserving soil, water, and air.* The goals of this research are to use water more efficiently, reduce pollution, improve fertilizer-use efficiency in plants, control erosion, restore productivity to eroded soils, and prevent water pollution, ultimately resulting in better utilization and conservation of our natural resources.
- *Effects of soil erosion on soil productivity.* Wind and water are slowly eroding our fertile topsoil. As the topsoil is depleted, the ability of the remaining soil to grow crops is reduced. Scientists are working to determine the impact that soil erosion has on crop production in this country, and to develop ways to control erosion and restore productivity to eroded soils.
- *Controlling water quality.* Agricultural practices may have an adverse effect on downstream water quality. To prevent this, scientists across the country are developing and testing economical farm management practices to control water pollution from agriculture.
- *Efficient use and conservation of energy.* Scientists are developing systems to reduce the amount of energy used in

agriculture. In addition to doing research on photosynthesis and nitrogen fixation, they are trying to increase fertilizer efficiency and find better methods for drying grain and curing peanuts and tobacco. Minimum tillage, irrigation efficiency, increased forage production, production of biomass for energy, and new uses for solar energy are all being studied.

- *Plant and animal resistance to pests and environmental stresses.* Both plants and animals are subject to severe losses in productivity through stresses imposed by pests and adverse environmental factors. Losses can be markedly decreased by using improved cultural and management systems and genetically superior, stress-tolerant varieties and breeds.
- *New pest control technology.* Even with today's sophisticated pest control technologies, more research is needed to reduce crop losses from insects and other pests. The role of insect migration in causing outbreaks is being studied along with the chemistry of host plant resistance to attack, animal host immunity to pests and diseases, insect pathogens for control of major insect pests, the fate of fungicides in plants and animals, the regulation of insect hormone systems, the use of behavioral chemicals to increase effectiveness of beneficial insects, the development of new technology to control weeds, and the incorporation of all these components into a system of integrated pest management.
- *Controlling animal losses from diseases, parasites, and toxicants.* Diseases, internal and external parasites, and toxicants cause major losses of animals and are major contributors to low animal productivity. Research is needed to find new and improved methods of identifying losses, rapidly diagnosing recognized diseases, detecting inapparent carriers, and identifying new diseases. Recombinant DNA technology is expected to revolutionize the production of biological materials that are needed to prevent diseases or promote growth.
- *Photosynthesis.* Scientists estimate that an increase of only 1 percent in photosynthetic efficiency would be of great importance in meeting food production goals.
- *Photosynthesis.* Scientists estimate that an increase of only 1 percent in photosynthetic efficiency would be of great importance in meeting food production goals.
- *Improving the ability of plants to capture or "fix" nitrogen.* Because all-out food production could result in a shortage of nitrogen fertilizer, scientists are working to find the best ways to use every pound of fertilizer and to improve the

- ability of certain plants to capture nitrogen from the air.
- *Improving nutritional quality in certain crops.* High-yielding cereals, legumes, and vegetables are sometimes deficient in nutritional content—protein, vitamins, minerals, and fiber. Improved quality in feed grains would come close to eliminating the need for high protein supplements in animal feed rations, thus releasing protein for other uses. To provide a greater availability of vitamins and protein for the future, research will be valuable in increasing the nutritive content and improved blending of proteins of foods.
 - *Food losses.* Food losses occur at every level of the food chain, from production to home preparation to export. Losses in the marketing sector alone are estimated at \$31 billion per year. Scientists are developing biological methods to prevent and control such losses without harm to the quality and safety of the products. Additionally, by lessening the perils of transportation and distribution to perishable commodities, research expands the marketing window for exports.
 - *Producing more and better forage.* Research on forage could lead to improving livestock production capabilities of more than 900 million acres of marginal lands. If vegetation can be increased by only threefold, this land will support more than twice the number of cattle needed for the entire country.

Areas to be given special emphasis in 1987 include conserving, reclaiming, and efficiently using natural resources needed to sustain agricultural production; increasing the efficiency of animal and crop production systems; increasing the efficiency of processing, distributing, and marketing food and agricultural products to users and consumers; maintaining and improving systems to provide people with safe, nutritious, and esthetically pleasing food; and developing the means for integrating scientific knowledge into systems that optimize resource management and facilitate transfer of technology to users.

63. BIOTECHNOLOGY

Biotechnology, a term so new it is still being defined, involves the use of microbiology and biochemistry to genetically restructure living organisms. It could eventually lead to such things as changing parts of the animal body for such specific purposes as eliminating the controversial practice of dehorning.

Although the term "biotechnology" is relatively fresh, the concept is old and includes genetic engineering, as well as

established agricultural techniques, such as plant hybridization, artificial insemination, embryo transplants, and superovulation in animals.

Medical technology, agriculture, and traditional crop breeding are generally not regarded as biotechnology, but biotechnology affects all of these areas greatly. Plant agronomy might fall outside the definition, but plants provide the raw material for many biotechnological processes, so research in plant breeding and productivity is of direct importance.

Agricultural biotechnology is distinguished in at least two ways from health, medical, and pharmaceutical biotechnology. First, most agricultural applications of biotechnology will require some degree of release of bioengineered material from physical containment. Also, there may be some persistence of the organism or product in an agricultural ecosystem so as to achieve the intended agricultural effect.

Because of controversial questions arising from biotechnology, the following agencies share responsibility for regulating agricultural biotechnology: the U.S. Department of Agriculture, the Food and Drug Administration, and the Environmental Protection Agency.

On June 26, 1986, USDA published an announcement of its policies on biotechnology in the Federal Register, and also proposed USDA Guidelines for Biotechnology Research and biotechnology-related amendments to its plant-pest regulations. USDA asked for public comments on both proposals by September 26, 1986.

The comments are being used by both USDA and the inter-agency Biotechnology Science Coordinating Committee (BSCC), on which USDA is represented, to develop a unified set of Federal guidelines for biotechnology research.

New provisions relating to agricultural research may be included in the National Institutes of Health (NIH) Guidelines for Research Involving Recombinant DNA (Deoxyribonucleic acid) Molecules in the process of developing Federal guidelines.

In July 1986, the Secretary of Agriculture established a USDA Office of Agricultural Biotechnology (OAB), which is modeled after the NIH Office of Recombinant DNA Activities.

The OAB will handle safety review of agricultural biotechnology research proposals by assisting with development of policies and procedures of agricultural laboratory and field research and related experimentation on agricultural biotechnology products before their commercialization.

Agricultural biotechnology applications for regulated commercial products and certain living organisms are currently submitted directly to the USDA regulatory agencies having juris-

diction, usually either the Animal and Plant Health Inspection Service (APHIS) or the Food Safety and Inspection Service (FSIS).

The two regulatory agencies periodically inform OAB about their biotechnology-related activities. APHIS, for example, has reported receiving applications pertaining to recombinant-derived veterinary biological products and genetically engineered plants, some of which will involve field testing. FSIS has held discussions with industry representatives on possible uses of genetic engineering in food animals.

USDA officials have established a Committee on Biotechnology in Agriculture (CBA) to study biotechnology policy issues unique to agriculture. It is cochaired by the Assistant Secretary for Science and Education and the Assistant Secretary for Marketing and Inspection Services. Other members include administrators of six USDA agencies that come under the cochairing jurisdiction.

The committee will deal with issues such as defining terms that will be generally recognized and accepted and protecting public needs for disclosure while protecting the security of confidential business information.

The benefits of biological control quickly outstripped the costs, and the benefits increased as the wasps became more firmly established.

Breeding resistant crops has been another successful control technique, especially against diseases and insects. USDA provides resistant germplasm, which is a vital source of breeding materials for providing specific varieties in State and industry programs.

Genetic methods being studied by USDA scientists include the sexual sterilization of insects and their release into a native insect population so that the normal insects mate with sterile insects and do not produce offspring. This method is extremely useful for suppressing low levels of some insect populations, such as the screwworm, over large areas.

Pesticides remain one of our major components in integrated pest management systems, as they are one of the most effective defenses against pests that affect our health and well-being and attack our crops, livestock, pets, and structures.

USDA scientists conduct studies to find ways to better utilize pesticides through improved timing and methods of application and use. They conduct research on the development of selective nonpersistent and biodegradable pesticides and on improved formulations of pesticides.

USDA scientists are also developing better methods for detecting and measuring pesticides and their metabolites to

minimize pesticide residues.

Department scientists investigate the pathology, metabolism, and fate of pesticides in plants, animals, soils, air, and water. Emphasis is given to determining pesticide residues in plants and animals, modes of action, metabolic pathways of degradation, metabolic products formed, and the safe disposition of these products.

Because of limited sales potential, minor uses of pesticides do not provide sufficient economic incentive to warrant registration by the chemical industry. However, as these uses are often highly beneficial to the public, the Department carries out a program to assure that data is developed to support registration of pesticides for minor uses. This assures agricultural producers of continued availability of pesticides for minor uses, and assures the public of high-quality agricultural products.

Because pesticides may cause undesirable effects if improperly used, the Department encourages the use of effective pest controls that provide the least potential hazard to human health, livestock, fish and wildlife, and to beneficial insects. Persistent pesticides are not used in Department pest control programs when an effective nonresidual method of control is available. When persistent pesticides are necessary, they are used in minimal amounts, applied precisely to the infested area and at minimally effective frequencies.

USDA scientists have developed technologies to remotely sense the presence and densities of pests. In addition, scientists have developed the use of computer-based models to assist growers in analyzing field data as a basis for making the best possible decisions in pest management.

Department scientists are developing ways to harmonize chemical pesticides with integrated pest management systems for a variety of farm commodities to complement farming or production systems. Scientists are also studying new methods of pest control, such as hormones that regulate the growth, development, and reproduction of insects and other invertebrates.

Hormones or insect growth regulators (IGRs), occurring naturally in low concentrations at various points in the life cycle of an insect, and related chemicals (analogs) can disrupt a wide range of body functions when applied at a critical time during the life cycle. IGRs represent a new class of pesticides that have great potential for application in pest management programs because they are narrow-spectrum, biodegradable, and support environmental quality with relative safety.

Because of the important issues on the use of pesticides and pest control practices, the Department has conducted a National

Pesticides Impact/Assessment Program since 1976. The primary purpose of this program is to coordinate and develop official USDA policy positions and viewpoints on pesticide and related issues.

The program is critical to American agriculture, because accurate, objective data is necessary to evaluate the effects of pesticide regulation in forestry and agricultural productivity and the quality and use of soil and water resources.

64. PESTICIDES AND INTEGRATED PEST MANAGEMENT

The Nation's food and fiber needs are now being met by only a small portion of the total work force of the Nation, thus freeing much of the work force needed to provide other goods and services that contribute to our high standard of living.

This would not be possible without methods to control many of the estimated 10,000 species of harmful insects, more than 1,500 diseases caused by micro-organisms, 1,800 different weeds that cause serious economic losses, and about 1,500 kinds of nematodes that damage crop plants.

The Department of Agriculture has expanded its efforts to develop and implement integrated pest management, an approach that employs a combination of techniques to control the wide variety of pests that threaten agricultural products. Integrated pest management involves appropriate reliance on natural pest population controls, usually in a combination of techniques that contribute the most economically effective suppression, including cultural methods, diseases that attack specific pests, resistant crop varieties, genetic methods, attractants, augmentation of parasites or predators, or chemical pesticides as needed.

Scientists in USDA's Agricultural Research Service (ARS) and in State agricultural experiment stations (SAES) are conducting research on the various components of integrated pest management to improve their use and application. They study farming practices that might weaken the pest's environment, and they also look for ways to take advantage of a pest's natural enemies.

Their investigations include land preparation and cultivation, crop rotations, fallow, timing of planting and harvesting, and timing of irrigation.

This approach, which is called biological control, has special importance for North America, where most farm pests are immigrants. The immigrant pests can proliferate unhindered, because they often cross the ocean without taking along their

own natural enemies.

In its broad sense, biological control includes techniques such as sex pheromones that are used to lure insects to traps or other devices, or to prevent male and female insects from locating each other.

In its classical sense, biological control means using predators, parasites, and pathogens to combat plant pests.

Predators and parasites include insects, mites, and nematodes that naturally attack a target pest. Predators kill the pest outright. Parasites sap the target pest more slowly, gradually injuring or killing it.

Pathogens include bacteria, viruses, or fungi that cause diseases specifically injurious to a target pest.

In recent years, USDA's Animal and Plant Health Inspection Service (APHIS) has been developing a program specifically designed to use biological control in a broad-scale, organized manner. Selection of targets covers old, established pests as well as newly arrived ones.

Research scientists and State regulatory officials contribute ideas, which are reviewed annually by a Biological Control Review Group. The group considers the severity of a pest problem, the likelihood that biological control can make a meaningful difference, and the chances that a known biological control agent (or a combination of different biological control agents) can handle the job. The group also makes sure solid evidence exists that the agents will not do inadvertent harm.

Success in biological control is illustrated by the campaign against the alfalfa weevil, which became established in the United States in 1905. It was biologically targeted because it began taking up to a half billion dollars or more from the pockets of U.S. farmers each year.

ARS scientists saw promise in controlling the weevil with several species of tiny parasitic wasps from Europe. In the 11 States where ARS distributed the wasps between 1959 and 1979, the need to spray chemical insecticides on alfalfa fields dropped an average of 73 percent.

Some States reported virtually 100 percent protection from the weevil. The reduced need to spray has been saving farmers an average of \$8 million year after year, while USDA spent only \$1 million on the program over a 20-year period.

APHIS biological control specialists began spreading the parasitic wasps on an organized basis in 1981. After 4 years or more, farmers reduced spraying by 5.4 percent in a 13-State area according to a preliminary study by USDA's Economic Research Service. This generated savings of about 38 cents an acre. Applied to the estimated 12 million acres of alfalfa

produced in the area, savings totaled as much as \$4.4 million a year.

65. PLANT PROTECTION AND QUARANTINE

In most cases, plant pest problems are handled by farmers, ranchers, and other property owners and their State or local governments. However, when an insect, weed, or disease poses a particularly serious threat to a major crop, the Nation's forests, or other plant resources, Plant Protection and Quarantine (PPQ) of USDA's Animal and Plant Health Inspection Service may join in the control work.

Most pests and weeds that are targets of PPQ programs are not native to America. They gain entry into this country through commercial trade channels, international travelers, or other means. PPQ has the additional responsibility of preventing new introductions.

Agricultural quarantines are the first line of defense against foreign pests. Quarantines regulate the importation of materials that may harbor exotic insects, diseases, or weeds. For example, a tropical fruit may contain the eggs or larvae of a score or more of highly destructive fruit flies.

The fruit usually cannot be brought into this country without a permit issued by PPQ, and the fruit may also be subject to inspection, treatment, and other safeguards to eliminate pest entry.

In 1986, PPQ inspectors at international ports of entry (along with cooperating customs officers) inspected approximately 570,000 air and ship arrivals carrying million of pieces of luggage. Countless commercial shipments must be checked, as well as all ship and aircraft cargo and stores arriving from overseas. In fiscal year 1986, more than 230,000 interceptions of significant plant pests were made from international travelers arriving by plane or ship.

A large volume of prohibited animal products is also intercepted every year by PPQ inspectors. Such products could be the means of accidental introduction of costly foreign animal diseases such as African swine fever, foot-and-mouth disease, rinderpest, and contagious pleuropneumonia.

When foreign plant pests do manage to slip through the quarantine barrier, PPQ conducts short-term operations—such as the Mediterranean fruit fly eradication project in California—to eradicate or control outbreaks. When pests are new to this country, control techniques may not be available. In any case, PPQ applies interstate quarantines and takes other steps to prevent spread until effective control measures can be developed.

In many cases, the foreign pests are only minor problems in their native lands because they are kept in check by native parasites, predators, and diseases. Since such natural enemies usually do not exist in the United States, one of PPQ's primary control techniques is the importation, rearing, and release of parasites and other biological control organisms. Other tools include pesticides, release of sterile insects, and cultural controls.

Control programs are designed with all safeguards needed to protect the health of people, domestic animals, crops, wildlife, and general environmental values. Whenever possible, nonchemical control methods are used. Each program is critically reviewed for its impact on the environment.

Much of the protection and quarantine work is jointly planned, financed, and executed with the affected States. An example of such cooperative effort is the computerized National Plant Pest Survey and Detection System, a nationwide network coordinated by PPQ. Under the system, universities, State departments of agriculture, agricultural experiment stations, and others can monitor pest populations and spot new outbreaks early.

Hemispheric cooperation is maintained through the North American Plant Protection Organization (NAPPO), involving the Canadian, Mexican, and U.S. plant protection organizations. NAPPO's objectives include control of pests of mutual concern or pests that pose an imminent threat to North American agriculture.

66. VETERINARY SERVICES

Protecting the health of the Nation's livestock, poultry, and other animals is the responsibility of Veterinary Services of USDA's Animal and Plant Health Inspection Service.

This team of trained veterinarians, animal health technicians, and other professionals has six primary tasks:

- (1) keeping foreign diseases out of this country;
- (2) eradicating outbreaks of those that get past our border defenses;
- (3) fighting domestic animal diseases of economic significance;
- (4) preventing interstate spread of diseases;
- (5) safeguarding veterinary biologics;
- (6) and providing for humane care of animals.

Disease control and eradication programs are carried out through close cooperation among the Federal and State governments, the veterinary profession, and the livestock and poultry industries.

The battle against livestock diseases began in 1884 when

Congress created a special agency within USDA to combat bovine pleuropneumonia—a dread cattle disease that was crippling exports as well as taking a heavy toll of cattle in the North-eastern and Midwestern States.

Within eight years, contagious bovine pleuropneumonia had been eradicated. This campaign set the pattern for subsequent disease control and eradication programs.

Diseases that have been eradicated in addition to bovine pleuropneumonia include foot-and-mouth disease, Texas cattle fever, fowl plague, Venezuelan equine encephalitis, sheep scabies, screwworms, exotic Newcastle poultry disease, and hog cholera.

Other diseases and parasites currently being combated by Veterinary Services include brucellosis, cattle fever ticks, tuberculosis, cattle scabies, and pseudorabies in swine.

Disease control and eradication measures include quarantines to stop the movement of possibly infected or exposed animals, testing and examination to detect infection, destruction of infected (sometimes exposed) animals, treatment to eliminate parasites, vaccination in some cases, and cleaning and disinfection of contaminated premises.

In this era of rapid air and land travel, U.S. livestock are exposed to ever-increasing threats from exotic diseases. Import regulations, aimed at keeping out such dangerous diseases as foot-and-mouth disease, African swine fever, and rinderpest, are administered by Veterinary Services.

In addition, a special team of trained veterinarians and livestock inspectors has been established within Veterinary Services to respond immediately to any outbreak of a foreign animal disease. Veterinary Services also certifies the health of export animals.

Under the Virus-Serum-Toxin Act of 1913, Veterinary Services enforces regulations to assure that animal vaccines and other veterinary biologics are safe, pure, potent, and effective.

Veterinary Services also enforces humane laws, including the handling of livestock transported by railroad; care and treatment of animals used in research, the wholesale pet trade, and zoos and circuses.

The unit also enforces the Horse Protection Act of 1970 (amended in 1976) prohibiting "soring," the use of cruel and inhumane practices to enhance the gait of show horses.

Veterinary Services programs are carried out by a field force of about 600 veterinarians and about 525 lay inspectors, plus about 250 laboratory technicians, working out of area offices (usually located in State capitals). Staff officials for the various programs are headquartered in Hyattsville, Md.

VIII. THE RURAL SOCIAL ENVIRONMENT

67. RURAL POPULATION

Today, the United States is primarily urban. People who live in large cities and their suburbs and in small towns of at least 2,500 population account for three-fourths of the total population. Rural people number about 59.5 million.

Although rural population increased from 1970 to 1980 after being rather stable for several decades, its proportion of the total population fell slightly because the urban population grew more rapidly. Farm residents now number less than 6 million, and are a minority even in the rural population.

Table 16.—U.S. rural population, 1950, 1960, 1970, 1980, 1984 and 1985¹

[In millions]

	Total	Nonfarm	Farm ²
Previous farm definition:			
1950	54.5	31.5	23.0
1960	54.0	38.4	15.6
1970	53.9	44.2	9.7
Current definition:			
1980	59.5	53.4	6.1
1984	³	³	5.7
1985			5.4

¹Rural population includes all persons living in the open country and in towns of less than 2,500 inhabitants.

²Farm under the previous definition consisted of persons on places of 10 or more acres if at least \$50 worth of farm products were sold in the reporting year, and places under 10 acres with \$250 worth of sales. Under the current definition, the farm population consists of persons living on places with sales of agricultural products of \$1,000 or more.

³Not available

The farm population has declined as the technological revolution has greatly reduced the workpower required in agriculture. Since 1970, the rural nonfarm population has grown by an amount greater than the loss of farm people.

Future losses in the farm population will be numerically small compared with those of the past, since the present population is more in line with the state of farming technology, and many farm people also work off the farm. However, the full impact of the current farm crisis is yet undetermined. The total rural population is not likely to increase very much, because some rural

communities become urban as they grow.

Rural population trends vary from one region to another. Over a broad area of the Great Plains, western Corn Belt, coastal plain Cotton Belt, and the southern coalfields, the rural population declined substantially from 1940 to 1970 because of major losses in agriculture and mining employment.

On the other hand, rural population on the Pacific coast, in the Southwest, lower Great Lakes industrial belt, North Atlantic coast, southern Piedmont, and Florida Peninsula increased rapidly during this period.

Since 1970, most rural counties that were losing population in the 1960's have begun to grow again because of job development, commuting, or retirement.

However, since 1980, low farm income conditions in very recent years and a slump in mining and manufacturing employment have led to slow but widespread decline in population in many rural counties.

68. AGE AND RACE

The median age of the rural population is a little higher than that of the U.S. population as a whole (30 years). But migration has greatly altered the age composition in many rural areas.

In a number of Great Plains and Corn Belt counties affected by the drop in farm employment, the median age has risen to more than 40 years as young adults have moved away. In these areas, there are typically more people in their sixties than in their twenties. The needs, attitudes, and preferences of the elderly affect those communities more than elsewhere.

In other rural communities, however, the median age is in the midtwenties because of higher birth rates or job development.

Except for American Indians, the great majority of blacks and other racial minorities live in urban areas. In the not too distant past, blacks were disproportionately rural and agricultural, but since 1940 they have moved to the cities in large numbers.

In the 1960's alone, the number of blacks and other racial minorities on farms dropped about 64 percent. The decline resulted from the near elimination of the share cropping tenant system in cotton, peanut, and tobacco production in which many blacks had been engaged.

About 9 percent of the rural and small town population was black in 1980; 5 percent was Mexican-American, Indian, or other races.

69. NONMETROPOLITAN EMPLOYMENT*

Employment in nonmetropolitan areas has varied considerably in recent years, totaling 23 million in 1985. But the average annual unemployment rate has been rising, from 6.1 percent in 1979, for example, to 9.1 percent in 1985.

This compares with a general rise in employment in metropolitan areas from 59 million in 1974 to 77 million in 1979 and 84 million in 1985. Meanwhile, annual average unemployment rates in metro areas increased from 5.7 percent in 1979 to 6.7 percent in 1985.

Before 1980, unemployment rates were generally higher in metro areas than in nonmetro areas. However, in 1980, a turn-about occurred, and the nonmetro rate has been higher than the metro rate in recent years.

The most significant change in the nonmetro labor force in recent years is the large increase in the number of working women. Their numbers increased by 19 percent in both metro and nonmetro areas from 1979 to 1985, while the number of employed males rose 6 percent. In 1985, women made up 44 percent of both metro and nonmetro employment.

Nonmetro unemployment rates were higher than metro rates for both males and females in 1985. Rates for males were 8.1 percent in nonmetro areas and 6.7 percent in metro areas. Rates for females were 8.8 percent in nonmetro areas and 7.1 percent in metro areas.

The employment status of blacks and other minorities improved little in recent years in either area. The 1985 annual average unemployment rate for blacks was 15 percent and for Hispanics, 10.5 percent, compared with 6.2 percent for the majority category.

About 2 million nonmetro teenagers were employed in 1985, with 44 percent working in wholesale-retail trade industries. Teenagers had high unemployment rates in both metro and nonmetro areas. The 1985 teen unemployment rate was 19.5 percent in nonmetro areas and 18.3 percent in metro areas.

In 1985, about 11 million people 55 years old and over were employed. Three million were employed in nonmetro areas. The service industries and government employed 34 percent of the older workers in nonmetro areas; another 24 percent were self-employed.

Farmwork accounted for 11 percent of their employment,

* *The 1985 metropolitan/nonmetropolitan statistics are based on the 1980 delineation of metropolitan areas as amended in 1983 and are not comparable to previous years.*

mostly as self-employed farm operators. The unemployment rate for older workers was very low, about 4 percent.

Between 1979 and 1985, U.S. employment shifted toward service-producing industries, such as retail trade, transportation, financial, business, and health industries.

The concentration of wage and salary employment in service-producing industries increased from about 50 percent in 1979 to 55 percent in 1985.

In 1985, service-producing industries employed about 46 percent of the workers in nonmetro areas. Wage and salary employment was still important in goods-producing industries (agriculture, mining, construction, and manufacturing) employing 35 percent of the workers.

Overall, self-employment remained about the same in the United States. Agricultural self-employment (farm operators) decreased as did unpaid family workers.

70. RURAL INCOME AND POVERTY

Median family income has been consistently lower in nonmetro areas than in metro areas. During the late 1970's and early 1980's, little progress was made in narrowing this gap. In fact, by the mid-1980's the gap had widened. For example, in 1975, median income for nonmetro families (11,600) was 22.2 percent below the metro median family income (\$14,909).

In 1985, the difference between the nonmetro median family income (\$21,956) and metro median family income (\$30,045) was 26.9 percent.

Nonmetro areas also have a higher percentage of their population living below the poverty level than do metro areas. In 1975, 15.4 percent of the nonmetro population was poor, compared with 10.8 percent of the metro population. By the late 1970's, poverty rates in both areas fluctuated, but by 1980 the nonmetro poverty rate was 15.7 percent while the metro rate was 11.9 percent.

However, between 1980 and 1985, the nonmetro poverty rate climbed to 18.3 percent, while the metro rate, which fluctuated between 11.9 and 13.8 percent, was 12.7 percent in 1985.

71. LOCAL GOVERNMENTS

In 1982, there were 82,688 units of local government serving the Nation. The majority of these were located outside Standard Metropolitan Statistical Areas (SMSA's).

In 1981, local governments employed the equivalent of 7.8 million full-time workers and spent over \$245 billion for the provi-

sion of public services and the construction and maintenance of public facilities.

Over the last 20 years, local government activity has increased dramatically in metro and nonmetro areas alike. However, most of the growth occurred in the sixties and early seventies. Since the midseventies, inflation-adjusted spending per capita has actually declined for the local government sector. Slow growth in the size of Federal and State intergovernmental aid programs, taxpayer resistance to tax increases, and the poor performance of the economy have all acted to hold down the growth of local government spending during the last 5 years.

Although economic recovery helped raise local government revenues by 8 percent in 1983, local government employment increased only 0.2 percent.

In general, nonmetro governments continue to spend less per capita than do governments inside SMSA's. As a result, debt burdens are lower and fewer dollars are collected for local government functions. Nonmetro governments rely heavily on intergovernmental transfers, particularly from the State government.

In 1982, 34 percent of the revenue raised by nonmetro governments came from the State (either as State aid, or as Federal aid passed through the State government), compared with 30 percent for metro areas.

Both user fees and utility charges have been consistently more important revenue sources in nonmetro than in metro areas. User fees in particular have grown in importance over the last decade.

In contrast, direct Federal aid has consistently been more important to local governments in metro than in nonmetro areas.

For many of the governments serving highly rural isolated areas (counties with no urban centers of their own and no close SMSA), financial trends of the last decade have created problems much like those faced by large city governments.

Highly rural areas have high per capita property taxes, high tax effort (taxes in relation to income), high vulnerability to cuts in intergovernmental aid, and have experienced rapid increases in per capita expenditures. Each of these characteristics is associated with potential financial problems.

72. FEDERAL FUNDING FOR RURAL AREA DEVELOPMENT

Although Federal funds going to rural areas and small towns grew more rapidly in the late 1970's than did Federal funding to metropolitan areas, rural areas still lagged.

In 1980, federal funds reaching nonmetro counties averaged \$2,139 per person, up 68 percent from 1976. Funding to metro counties averaged \$2,529, up 63 percent since 1976.

Federal funding includes payments, loans, and other transfers of money to support Federal, State, and local programs in agriculture, forest management, housing, transportation, education, health, public assistance, Social Security, veterans' benefits, defense, energy, and so on. Figures on the metro-nonmetro distribution of funds are based roughly on the 85 percent of Federal funds that can be reliably traced to county levels.

Although rural areas made some progress in catching up with more urbanized counties, the figures may overstate their position. A much larger share of nonmetro funding is in the form of loans and loan guarantees—20 percent compared with only 11 percent of metro funding. Loans must be repaid, so they have less value than grants.

Nonmetro counties also received a much larger share of their funds for income security programs, especially retirement and disability programs. Forty-six percent of nonmetro funds were for such programs, compared with 37 percent of metro funds.

Despite overall improvement in nonmetro funding, more recent metro area gains threaten to offset the growing urban-rural parity. Since 1978, metro area funding growth, at 22 percent, has outpaced that in nonmetro areas, at 16 percent.

73. RECREATION

Recreation uses are getting more emphasis on both public and private lands. In fiscal year 1985, the National Forests, managed by USDA's Forest Service (FS), furnished 220 million visitor-days (12 hours of recreation use) of recreation. People were attracted to the forests by more than 6,000 campgrounds and picnic areas, 320 swimming developments, 1,106 boating sites, and 307 winter sports sites. If all these facilities were fully occupied at the same time, they could accommodate 1.8 million persons.

The National Forest watersheds that provide most of the Nation's big river water supply are also maintained by the Forest Service.

The Forest Service supervises mining and other surface activities in the National Forests and protects lands against fire and erosion. Activities, such as these, enhance hunting and fishing opportunities. In fiscal year 1985, the National Forests supplied 15.8 million visitor-days of fishing and 14.6 million of hunting.

Each year the Soil Conservation Service (SCS) assists thou-

sands of landowners in applying conservation practices on the land. SCS helped landowners improve approximately 667,000 acres of recreation and wildlife land during fiscal year 1986.

In 1986, SCS began construction of 10 new Public Law 83-566 small watershed projects, approved planning for 47 projects, authorized installation of 32 projects, and completed construction on or closed out 15 projects.

By the end of 1986, public recreation developments in 269 projects had been planned or completed in P.L. 566 small watershed projects in 45 States. This \$500 million investment, with 50 percent being local funds, will provide more than 44 million visitor-days of recreation each year.

The developments include more than 145,000 surface acres of water and facilities for swimming, fishing, boating, waterskiing, camping, hiking, and picnicking.

In fiscal year 1986, work continued in the 191 areas authorized for assistance under the Resource Conservation and Development (RC&D) program. SCS provides leadership for these locally initiated, sponsored, and directed areas designed to conserve natural resources. In fiscal year 1986, RC&D measures completed numbered 1,053.

74. RURAL PUBLIC SERVICES

Rural local governments face special problems in providing services for their citizens. The following are rural characteristics that affect ways in which rural local governments provide services:

First, isolation, the geographic separation of rural areas from metropolitan centers, leads to low utilization rates for rural public services, inadequate response times for emergency services, and the detachment of service delivery professionals from their colleagues.

Second, low population density means higher per unit costs of some services and the inability to supply specialized help (for example, the handicapped) because the area cannot support the services for so few clients.

Third, the lack of fiscal resources puts many rural communities in a financial squeeze with resulting service deprivation for local residents.

Fourth, the lack of human resources, an adequate supply of trained personnel, has several implications for service delivery in rural communities: Critical functions may go understaffed, scarce employees are often overworked, service quality and quantity suffer, and long-range planning becomes difficult.

Isolated rural communities often suffer from medical services

and facilities less adequate than those found in metro areas. Even if medical care services were evenly distributed across the Nation, and were of equal quality, it is likely that nonmetro residents with chronically low incomes would still have serious difficulty receiving adequate care in a complex medical system where access is based mainly on ability to pay.

Because many rural governments are small and the communities lack resources, alternatives must be found for providing public services.

Improved health education might offset some of the problems of health care associated with isolation. Part of the evidence is that the principal causes of death in the Nation are heart disease, cancer, stroke, and accidents. It is argued that special educational efforts and supportive programs would be more effective in improving health than would incremental improvements in medicine. This assumes that pandemics and epidemics due to infectious agents have been largely eliminated, and that unhealthy, sedentary lifestyles have emerged as the chief villains causing needless morbidity and early deaths.

Additionally, some communities contract with private sector firms to provide important services. Additionally, 36 percent of rural localities contract out legal services to for-profit firms rather than perform them themselves.

Some communities that want to attract new residents and businesses may find it beneficial to cooperate with other towns and share in the cost of furnishing services it cannot afford by itself. Rural communities can work together in a variety of ways, and mutual aid is one way. Such an approach is commonly used for fire and police protection.

A second approach is for one community to sell a particular service to another. About 23 percent of isolated rural governments contract with another government for solid waste disposal, about 19 percent for the operation of libraries and 18 percent for tax assessing.

Still another method of cooperation is joint action, especially for large projects such as building and operating hospitals or airports. Various methods of dividing costs and creating joint committees or governing boards are worked out for such projects.

Although most rural community residents do not enjoy the same level of public services available to urban area residents, much progress has been made to improve some rural services in the last 20 years. Rising incomes and increased aid from higher level governments made it possible for more and better programs for rural governments.

The management capacity of rural governments to plan and

carry out these programs has improved. For example, in the sixties and seventies a nationwide system of multicounty substate regional agencies was developed to help rural communities plan for and manage their new population growth.

Still, the institutional base of rural governments is more fragile than that of urban areas, and these isolated governments remain more vulnerable to external changes than metropolitan governments.

75. THE NATION'S AGRICULTURE 200 YEARS AGO

As part of USDA's observance of the Bicentennial of the U.S. Constitution, here are some facts about U.S. American agriculture in 1787, the year the Constitution was signed.

Farm Population

In 1787, the United States was a nation of farms and small communities spread along the Eastern seaboard.

The 1790 census showed that about 90 percent of all U.S. residents in the labor force were farmers. Only about 5 percent of the population (202,000 people out of 3.9 million) lived in urban areas, towns of 2,500 or more.

Had Indians been counted in the census, the urban percentage would have been even smaller.

The large farm population probably explains the average household size of 5.79 people in 1790, the highest of any census. The population was young and the birthrate high.

In 1800, when the U.S. began keeping more detailed population figures, the median age was 16 and the birthrate 55 per 1,000, also the highest census figure to date.

The population was concentrated in the older eastern States in 1790, with Virginia being the most populous, because the settled area extended westward an average of only 255 miles from the east coast.

Ethnically, 78.9 percent of the people were of British or Irish origin, and 8.7 percent came from German areas.

Some States had large concentrations of certain groups: Pennsylvania was one-third German, New York and New Jersey about 17 percent Dutch. Racially, 3.2 million U.S. citizens were white, 757,000 were black, mostly slaves.

Farm Production

Colonists brought European crops with them, but also planted many native to the new world, including corn, potatoes, yams or sweet potatoes, squash, and cranberries. (Turkey also originated

in America.)

Total income from agriculture was \$266 million in 1800 (the first year for which figures are available). This was 39.3 percent of national income.

At that time each farmworker grew enough food for about four other people.

It took about 373 hours of labor for a farmer to produce 100 bushels of wheat, 344 hours for 100 bushels of corn, and 601 hours for a bale of cotton.

The following chart on productivity indicates how labor requirements have changed since the beginning of the 19th century.

Labor required to produce wheat, corn, and cotton.

(hours)

	1800	1935-39	1955-59	1980-84
Wheat (100 bushels)	373	67	17	7
Corn (100 bushels)	344	108	20	3
Cotton (1 bale)	601	209	74	5

Yields per acre were 15 bushels for wheat, 25 bushels for corn, and 154 pounds for cotton.

And the following chart shows yield changes since 1800.

Yields per acre of wheat, corn, and cotton

	1800	1940	1960	1985-86
Wheat (bu.)	15	15	20	34
Corn (bu.)	25	29	55	118
Cotton (pounds)	154	253	446	630

In 1790, 3,000 bales of cotton were produced. With the advent of the cotton gin in 1793, production rose to 73,000 bales by 1800. Other crops produced at this time include 160 million bushels of grain products, 22 million bushels of wheat, 107 million pounds of tobacco, and 300 million board feet of lumber.

Foreign Trade

U.S. trade still resembled that of the colonial period—raw materials were exported and manufactured goods were imported. Trade was extremely important, as nearly all income to the Federal Government came from import tariffs until the War of 1812.

In 1790, the United States exported 20 million dollars' worth of goods and imported 23 million dollars' worth. A negative balance of payments was the norm for this period, and it was not until agricultural exports picked up in the 19th century that the balance of payments approached equilibrium.

Exports were principally agricultural—tobacco, rice, indigo, wheat, flour, naval stores. Tobacco was, by far, the leading export. In 1790, 188,000 hogsheads (containing roughly 800 pounds of tobacco each) were shipped overseas. The same year the United States shipped 74 million pounds of rice, and the next year (1791) shipped 3.8 million bushels of wheat and 1.7 bushels of corn.

Imports included some agricultural tools, though most small tools were made by village blacksmiths.

Methods of Farming

U.S. farming techniques differed widely from European techniques. In Europe, land was scarce and labor plentiful, so agriculture was labor intensive. Farmers often lived in villages and farmed multiple strips of land in the medieval style.

In the U.S., land was plentiful and labor scarce. Farmers often cared little for preserving the land, because it was easier to find new land than to try to restore wornout fields. Thus, farmers here were spread out across the land on individual farms; exhausted fields and virgin woodland stood next to cultivated fields.

However, certain ethnic groups, like the Germans, remained closely knit in the New World. They adapted to the conditions of the United States, but brought with them careful farming methods, such as the use of manures. Old sections of New England kept a modified version of the European village.

Farmers produced nearly all their own food, but specialization had already begun to appear in areas with ready access to markets.

New England produced livestock and corn; the middle States grew wheat and raised cattle; Maryland, Virginia, and North Carolina supplied tobacco; South Carolina and Georgia grew rice and indigo. Southerners were only beginning to cultivate cotton.

The era of turnpike (tollroad) building took place during the first half century under the Constitution; the first turnpike, from Philadelphia to Lancaster, opened in 1794. Turnpikes improved communication and commerce between the settlements, offering farmers better access to markets.

The flour mills in Pennsylvania, Delaware, and Maryland were among the most advanced in the world. In 1780, Oliver Evans

invented a flour mill that operated automatically.

Farm labor was always scarce in the U.S. in relation to the amount of land available. Most farmers relied on family members to do all the work of the farm.

The South developed its own distinctive form of agriculture, the plantation system based on slave labor.

Because of the labor shortage, Americans had an interest in adopting labor-saving technology, but in 1787 the typical farmer still worked the way his ancestors had.

Most farmers did only haphazard rotating of crops, seldom fertilized, let their animals run loose, and showed little inclination to try new varieties of plants or livestock. Improvements in farming equipment were slow in coming; farmers continued to use wooden plows pulled by oxen, which barely scratched the surface.

Nevertheless, efforts by leading farmers to improve agriculture were getting under way at the time of the Constitution.

In 1785, the Nation's first two agricultural societies were formed: the Philadelphia Society for the Promotion of Agriculture and the South Carolina Society for Promoting and Improving Agriculture and Other Rural Concerns.

Some of the leading political figures were also leading agriculturalists. For example, Benjamin Franklin had sent back soybean seed when he was Ambassador to France in 1780, although it did not succeed as a major crop until over a century later.

One of Thomas Jefferson's innovations was a moldboard plow based on scientific principles, which he invented in 1793.

After receiving two jennets and a jackass from the Marquis de Lafayette as a gift in 1785, George Washington bought another jennet from Surinam Dutch Guiana. Washington had approximately 60 mules at the time of his death. The value of the mule as a work animal was soon recognized.

Information about agricultural practices began to reach a wider audience in this period. Jared Eliot of Connecticut, one of the earliest students of soil science and agriculture in general, had published his influential "Essays upon Field Husbandry in New England" between 1749 and 1759. This was followed by several books on American agriculture, including Samuel Dean's *The New England Farmer* (1790), which became a standard text on American agriculture.

Finally, the *Old Farmer's Almanac* began publication at Sterling, Mass., in 1793, inaugurating a tradition of farm almanacs that provided useful hints on agricultural techniques to ordinary farmers.

—**Douglas E. Bowers, Historian, Economic Research Service, USDA.**

APPENDIX I. USDA TABLES OF AGRICULTURAL INFORMATION

These tables were prepared mainly by economists of USDA's Economic Research Service.

Table 17.—U.S. agriculture's capacity to produce, 1951, 1956, 1961, 1966, and 1971-85

Year	Farms (thousands)		Farm population		Work-hours		Crops		Livestock		Overall Farm output 1977 = 100
	Num-ber	Change from preced-ing year	Thou-sands	Pro-portion of U.S. popu-lation (pct)	Total used (mil-lions)	Output per work-hour index 1977 = 100	Production volume index 1977 = 100	Production per acre index 1977 = 100	Production volume index 1977 = 100	Production per breeding unit index 1977 = 100	
1951	5,428	-220	21,890	14.2	15,222	20	60	59	73	68	63
1956	4,515	-140	18,712	11.1	12,028	28	63	64	79	73	69
1961	3,825	-138	14,803	8.1	9,400	39	70	78	86	84	76
1966	3,257	-99	11,595	5.9	6,858	53	73	83	91	91	79
1971	2,902	-47	9,425	4.6	5,741	74	86	96	100	98	92
1972	2,860	-42	9,610	4.6	5,433	78	87	99	101	100	91
1973	2,823	-37	9,472	4.5	5,321	81	92	99	99	97	93
1974	2,795	-28	9,264	4.4	5,178	79	84	88	100	96	88
1975	2,521	(¹)	8,864	4.2	4,975	89	93	96	95	92	95
1976	2,497	-24	8,253	3.9	4,788	94	92	94	99	98	97
1977	2,456	-41	7,806	3.6	4,654	100	100	100	100	100	100
1978	2,436	-20	6,501	3.0	4,446	108	102	105	101	102	104
1979	2,432	-4	6,241	2.8	4,343	119	113	113	104	104	111
1980	2,432	1	6,051	2.7	4,280	113	101	100	108	107	104
1981	2,434	1	5,790	2.6	4,195	131	117	115	109	108	118
1982	2,401	-33	5,620	2.4	4,034	133	117	116	107	108	116
1983	2,370	-31	5,787	2.5	3,683	122	88	100	109	112	96
1984	2,328	-42	5,754	2.4	3,758	138	111	112	107	113	112
1985	2,275	-53	5,355	2.2	3,587	155	116	118	110	120	119

¹New definition of farm began in 1975.²Not available for 1975; change in farm definition precludes comparison with 1974 farm numbers.³Estimated.

Table 18.—Agricultural prices, farm incomes, assets, and exports, 1951, 1956, 1961, 1966, and 1971-85

Year	Parity ratio ¹		in agricultural ²		Assets of proprietors ³				Harvested crop acreage				Value of agricultural exports (million dollars)
	Unadjusted (pct)	Adjusted (pct)	Farm operators' net income from farming	Aggregates (billion dollars)	Total assets (billion dollars)	Total liabilities (billion dollars)	Proprietors' equities (billion dollars)	Total (million acres)	Domestic use per capita (acres)	For export (million acres)			
											Total (billion dollars)	Total liabilities (billion dollars)	
1951	107	108	15.9	170.1	14.6	155.5	344	1.73	59	3,411			
1956	83	84	11.3	182.8	19.3	163.4	324	1.52	60	3,496			
1961	79	83	12.0	219.3	28.5	190.9	302	1.26	67	4,946			
1966	79	85	14.0	274.3	47.4	240.6	294	1.14	69	6,747			
1971	71	75	15.0	351.8	59.6	292.2	305	1.17	62	7,955			
1972	74	79	19.5	394.8	64.9	330.0	294	0.97	91	8,242			
1973	91	94	34.4	478.6	73.3	405.2	321	1.06	96	14,984			
1974	86	87	27.3	502.7	81.8	420.9	328	1.07	99	21,608			
1975	76	76	25.6	576.4	91.7	484.7	336	1.09	100	21,854			
1976	71	72	20.2	590.4	97.0	493.5	337	1.10	97	22,760			
1977	66	68	19.9	656.7	114.9	541.8	345	1.06	112	23,974			
1978	70	72	25.2	783.7	131.9	651.8	338	1.00	114	27,289			
1979	71	72	27.4	918.1	155.2	762.9	348	0.99	125	31,979			
1980	65	65	16.1	1,003.2	170.4	832.9	352	0.94	137	40,481			
1981	61	61	30.3	1,005.2	188.8	816.3	366	1.03	129	43,780			
1982	57	58	22.6	977.8	203.6	774.2	362	1.07	113	39,095			
1983	57	57	12.9	956.8	202.5	754.0	310	0.77	124	34,769			
1984	58	59	32.7	856.0	198.7	657.3	345	1.06	96	38,027			
1985	52	55	30.5	771.4	192.1	579.3	342	1.07	87	31,187			

¹Ratio of index of prices received to index of prices paid, interest, taxes, and wage rates—1910-14 = 100.

²Numbers based on new farm definition beginning in 1975.

³January 1 numbers, including farm households.

Table 19.—Leading States, commodities, for cash receipts, including net CCC loans, 1985

Commodities ¹	United States											
	Rank	Value	1	2	3	4	5	6	7	8	9	10
		Mill. dol.										
All commodities		142,103	Calif	Tex	Iowa	Ill	Nebr	Minn	Kans	Wis	Fla	Ind
All livestock		69,401	Tex	Iowa	Calif	Nebr	Wis	Minn	Kans	PA	Ill	Colo
All crops		72,702	Calif	Ill	Iowa	Tex	Fla	Minn	Nebr	Ind	Kans	Ohio
Cattle and calves			Tex	Nebr	Kans	Iowa	Fla	Minn	Nebr	Ind	Kans	Ohio
Dairy products	1	28,742	4,104	3,328	2,754	1,749	1,692	1,349	1,327	1,091	926	754
	2	18,135	Wis	Calif	NY	PA	Colo	Mich	Ohio	Tex	Iowa	Wash
	3	16,031	3,023	2,076	1,479	1,311	1,286	697	619	545	481	476
	4	10,804	Ill	Iowa	Nebr	Ind	Minn	Ohio	Wisc	Mich	Mo	Tex
	5	8,940	3,431	2,660	1,891	1,609	1,072	994	445	444	412	390
	6	7,862	Ill	Iowa	Ind	Minn	Ohio	Mo	Ark	Nebr	Miss	La
	7	5,680	1,933	1,581	930	898	826	758	589	416	387	269
	8	5,459	Iowa	Ill	Minn	Ind	Mo	Nebr	NC	Ohio	Kans	SD
	9	3,800	2,402	993	721	705	571	560	377	326	278	269
	10	3,252	Kans	ND	Okla	Tex	Wash	Minn	Colo	SD	Nebr	Mont
			1,378	1,056	578	559	488	478	409	383	275	249
			Ark	Ga	Ala	NC	Miss	Md	Del	Tex	Calif	Va
			981	796	629	551	418	378	311	297	274	207
			Calif	Fla	Tex	Pa	Oreg	Tenn	Mich	NY	Ga	NJ
			1,317	804	400	278	195	195	180	178	168	167
			Tex	Calif	Miss	Ariz	La	Ark	Ala	Tenn	Ga	Mo
			993	977	498	315	233	195	152	111	96	58
			Calif	Ind	Ga	Pa	NC	Ark	Tex	Ala	Ohio	Fla
			336	245	235	219	201	170	160	126	108	

Tobacco	11	2,722	NC	936	Ky	858	Tenn	Va	184	SC	167	Ga	140	Mo	40	Ohio	39	Fla	28	Ind	26
Hay	12	2,207	Calif	483	Tex	149	Colo	Kans	97	Idaho	93	Wash	91	NM	78	Oreg	78	Ariz	77	Okla	76
Sorghum grain	13	1,877	Tex	487	Kans	451	Nebr	Mo	172	Ark	118	Miss	62	La	49	Ill	45	Tenn	40	Okla	38
Turkeys	14	1,819	NC	298	Minn	251	Calif	Ark	136	Va	124	Mo	107	Ind	82	Wisc	76	Pa	67	Iowa	67
Potatoes	15	1,649	Idaho	898	Wash	213	Calif	Oreg	86	Wisc	86	Colo	73	Me	72	ND	68	Fla	67	Mich	n.a.
Oranges	16	1,423	Fla	933	Calif	468	Ariz	Tex	5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Tomatoes	17	1,196	Calif	542	Fla	411	Ohio	NJ	27	Tenn	24	Mich	19	SC	19	PA	16	Ind	14	Va	14
Peanuts	18	1,046	Ga	514	Ala	134	NC	Tx	108	Va	57	Fla	49	Okla	45	NM	9	SC	6	Ariz	1
Barley	19	1,024	ND	299	Idaho	141	Minn	Wash	108	Calif	64	Mont	62	Colo	45	SD	44	Oreg	33	Ariz	15
Grapes	20	985	Calif	905	NY	21	Was	Ariz	18	Mich	8	Pa	7	Ark	1	Ga	1	Ohio	1	n.a.	n.a.
Rice	21	944	Ark	422	Tex	165	La	Calif	103	Miss	77	Mo	28	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Apples	22	916	Wash	313	NY	89	Mich	Pa	59	Calif	57	Va	43	NC	30	Idaho	27	W Va	25	Ohio	20
Sugar beets	23	750	Calif	179	Minn	154	Idaho	ND	85	Mich	73	Nebr	34	Tex	27	Colo	22	Wyo	21	Mont	15
Cane for sugar	24	732	Fla	352	Haw	236	La	Tex	18	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Lettuce	25	675	Calif	472	Ariz	110	Fla	NY	9	Colo	8	Tex	8	NM	6	Mich	5	Ohio	4	NJ	4

n.a. = not applicable. Indicates no States with receipts of more than \$500,000.

¹Commodities are ranked by value of marketing including Commodity Credit Corporation loans. See table 11 for unround data and relative importance in United States for all commodities.

²Excludes mushrooms.

Table 20.—Income of farmers and farm people from all sources, 1940 and 1945-85

(Updated data provided from 1976 onward.)

(In billions—unless otherwise noted)

Year	Cash receipts from marketings ¹	Government payments to farmers	Gross cash receipts	Other income from farming ¹	Gross cash income before inventory adjustment ²	Gross farm income after inventory adjustment	Off-farm income ^{3, 7}	Total gross income all sources	Total production expenses	Net farm income before inventory adjustment	Net farm income after inventory adjustment	Total for family personal spending and investments ⁷	Number farms (millions)
1940	\$8.4	\$0.7	\$9.1	\$2.2	\$11.1	\$11.3		\$14.8	\$6.9	\$4.2	\$4.5		6.35
1945	21.7	0.74	22.4	3.0	25.8	25.4		31.4	13.1	12.8	12.3		5.97
1946	24.8	0.77	25.6	4.0	29.5	29.6		35.9	14.5	15.0	15.1		5.93
1947	29.6	0.31	29.9	2.5	34.1	32.4		39.6	17.0	17.1	15.4		5.87
1948	30.2	0.26	30.5	6.0	34.7	36.5		44.3	18.8	16.0	17.7		5.80
1949	27.8	0.19	28.0	2.8	31.6	30.8		38.7	18.0	13.6	12.8		5.72
1950	28.5	0.28	28.7	4.4	32.3	33.1		41.1	19.5	12.8	13.6		5.65
1951	32.9	0.29	33.1	5.1	37.1	38.3		46.7	22.3	14.8	15.9		5.43
1952	32.5	0.27	32.8	4.9	36.8	37.8		46.5	22.8	14.0	15.0		5.20
1953	31.0	0.21	31.2	3.2	35.1	34.4		42.6	21.5	13.6	13.0		4.98
1954	29.8	0.26	30.1	4.1	33.7	34.2		41.6	21.8	11.9	12.4		4.80
1955	29.5	0.23	29.7	3.8	33.3	33.5		41.2	22.2	11.1	11.3		4.65
1956	30.4	0.55	31.0	3.0	34.4	34.0		42.0	22.7	11.7	11.3		4.51
1957	29.7	1.02	30.7	4.1	34.2	34.8		42.8	23.7	10.5	11.1		4.37
1958	33.5	1.09	34.5	4.4	38.1	39.0		47.0	25.8	12.3	13.2		4.23
1959	33.6	0.68	34.3	3.6	37.9	37.9		46.3	27.2	10.7	10.7		4.10
1960	34.0	0.70	34.7	3.9	38.2	38.6	8.5	47.1	27.4	10.8	11.2	19.7	3.96
1961	35.2	1.49	36.7	3.9	40.2	40.5	9.2	49.7	28.6	11.6	12.0	21.1	3.83
1962	36.5	1.75	38.2	4.1	41.7	42.3	9.9	52.2	30.3	11.4	12.1	22.0	3.69
1963	37.5	1.70	39.2	4.2	42.7	43.4	11.0	54.4	31.6	11.1	11.8	22.8	3.57
1964	37.3	2.18	39.5	2.8	43.1	42.3	11.6	54.0	31.8	11.3	10.5	22.1	3.46
1965	39.4	2.46	41.8	4.7	45.5	46.5	12.7	59.3	33.7	11.9	12.9	25.6	3.36
1966	43.4	3.08	46.7	3.8	50.6	13.9	64.4	36.5	14.0	14.0	27.8	3.26	
1967	42.8	3.08	45.9	4.6	49.9	50.5	14.5	65.0	36.2	11.7	12.3	26.8	3.16

1968	44.2	3.46	47.6	4.2	51.7	51.8	15.5	67.3	39.5	12.2	12.3	27.8	3.07
1969	48.2	3.79	52.0	4.4	56.3	56.4	16.6	73.0	42.1	14.2	14.3	30.9	3.00
1970	50.5	3.72	54.2	4.6	58.8	58.8	17.6	76.4	44.5	14.4	14.4	32.0	2.95
1971	52.7	3.14	55.9	6.3	60.8	62.1	19.1	81.2	47.1	13.6	15.0	34.2	2.90
1972	61.1	3.96	65.1	6.1	70.3	71.2	21.3	92.5	51.7	18.6	19.5	40.8	2.86
1973	86.9	2.61	89.5	9.5	95.6	99.0	24.7	123.7	64.6	31.0	34.4	59.1	2.82
1974	92.4	.053	92.9	5.4	99.9	98.3	28.1	126.4	71.0	28.9	27.3	55.4	2.80
1975	88.9	0.81	89.7	10.9	97.2	100.6	23.9	124.5	75.0	22.2	25.6	49.5	2.52
1976	95.3	.7	97.2	8.4	97.2	102.9	26.7	129.6	82.7	21.7	20.2	46.9	2.50
1977	96.3	1.8	99.3	9.6	99.3	108.8	26.1	134.9	88.9	18.8	19.9	46.0	2.46
1978	112.4	3.0	117.3	11.2	117.3	128.4	29.7	159.1	103.2	23.3	25.2	54.9	2.44
1979	131.6	1.4	135.1	12.8	135.1	150.7	33.8	184.5	123.3	22.4	27.4	61.2	2.43
1980	139.7	1.3	143.3	14.6	143.3	149.3	34.7	185.0	133.1	22.4	16.1	50.8	2.43
1981	141.7	1.9	146.1	16.2	146.1	165.5	35.8	201.8	135.2	24.5	30.3	66.1	2.43
1982	142.6	3.5	150.6	18.6	150.6	163.9	36.4	199.8	140.8	23.9	22.6	59.0	2.40
1983	136.5	9.3	150.2	17.6	150.2	152.5	37.0	189.5	139.5	23.8	12.9	49.9	2.37
1984	142.2	8.4	154.9	17.6	154.9	174.4	37.9	212.3	141.7	26.4	32.7	70.6	2.33
1985	142.1	7.7	156.2	17.9	156.2	166.6	40.8	207.4	136.1	31.6	30.5	71.3	2.29

¹Predominantly noncash income from net change in value of farm inventories, gross value of farm products used on the farm, and a rental value for farm dwellings; also cash income from recreation, machine hire and custom work and forest product sales.

²Gross income from farming before adjustments for changes in value of farm inventory of crops and livestock. The next column does allow for an increase or decrease in value of inventories

³Includes nonfarm wages, salaries, interest, dividends, rental property, unemployment compensation, social security, etc., but does not include capital gains income from off-farm sources.

⁴Includes gross income from farming after inventory adjustment plus off-farm income of farm operator families.

⁵Net income from farming after change in value of farm inventory, plus off-farm income of farm operator families.

⁶per farm numbers based on new farm definition beginning in 1977.

⁷Series began with 1960.

Table 21.—Wheat: Area, yield, supply, disappearance, and prices, 1960-85¹

Year beginning June 1	Area (1,000 acres)		Yield per harvested acre (bu)	Supply (M bu)			Disappearance (M bu)		Prices received by farmers (dol per bu)		
	Planted	Harvested		Beginning stock	Production	Imports ²	Total	Domestic use		Exports ¹	
											Total
1960	54,906	51,879	26.1	1,384	1,355	8	2,747	591	654	1,245	1.74
1961	55,707	51,571	23.9	1,502	1,232	6	2,741	604	716	1,320	1.83
1962	49,274	43,688	25.0	1,421	1,092	5	2,518	599	649	1,248	2.04
1963	53,364	45,506	25.2	1,270	1,147	4	2,421	581	846	1,358	1.85
1964	55,672	49,762	25.8	993	1,283	2	2,279	635	723	1,358	1.27
1965	57,361	49,560	26.5	921	1,316	1	2,238	725	852	1,577	1.35
1966	54,105	49,613	26.3	660	1,305	2	1,967	683	771	1,454	1.63
1967	67,264	58,353	25.8	513	1,508	1	2,021	626	765	1,391	1.39
1968	61,860	54,765	28.4	630	1,557	1	2,188	740	544	1,284	1.24
1969	53,450	47,146	30.6	904	1,443	3	2,350	764	603	1,367	1.25
1970	48,739	43,564	31.0	983	1,352	1	2,336	772	741	1,513	1.33
1971	53,822	47,685	33.9	823	1,619	1	2,442	849	610	1,459	1.24
1972	4,913	47,303	32.7	983	1,546	1	2,531	799	1,135	1,934	1.76
1973	9,254	54,148	31.6	597	1,711	3	2,311	754	1,217	1,971	3.95
1974	71,044	65,368	27.3	340	1,782	3	2,125	672	1,018	1,690	4.09
1975	74,900	69,499	30.6	435	2,127	2	2,564	726	1,173	1,898	3.55
1976	80,395	70,927	30.3	666	2,149	2	2,817	754	950	1,704	2.73
1977	75,710	66,686	30.7	1,113	2,046	2	3,161	859	1,124	1,983	2.33
1978	65,989	56,495	31.4	1,178	1,776	2	2,955	837	1,194	2,031	2.97
1979	71,424	62,454	34.2	924	2,134	2	3,060	783	1,375	2,158	3.78
1980	80,788	71,125	33.5	902	2,381	3	3,286	783	1,514	2,297	3.91
1981	86,251	81,013	34.5	989	2,785	3	3,777	847	1,771	2,618	3.66
1982	86,232	77,937	35.5	1,159	2,765	8	3,932	908	1,509	2,417	3.55
1983	76,419	61,390	39.4	1,515	2,420	4	3,939	1,116	1,429	2,540	3.53
1984	79,213	66,928	38.8	1,399	2,595	9	4,003	1,155	1,424	2,578	3.38
1985	75,575	64,734	37.5	1,425	2,425	15	3,865	1,045	915	1,960	3.16

¹Revised data, 1985

²Imports and exports include flour and other products expressed in wheat equivalent.

Table 22.—Corn (grain only): Area, yield, supply, disappearance, and prices, 1960-85¹

Marketing Year ²	Area (1,000 acres)		Yield per acre (bu)	Supply (M bu)			Total	Disappearance (M bu)		Prices received by farmers (dol per bu)	
	Planted for all purpose	Harvested for grain		Beginning stock	Production	Imports ²		Domestic use	Exports ¹		Total
1960	81,425	71,422	54.7	1,787	3,907	1	5,696	3,387	292	3,679	1.00
1961	65,919	57,634	62.4	2,016	3,598	1	5,615	3,527	435	3,962	1.10
1962	65,017	55,726	64.7	1,653	3,606	1	5,260	3,479	416	3,895	1.12
1963	68,771	59,227	67.9	1,365	4,019	1	5,385	3,348	500	3,848	1.11
1964	65,823	55,369	62.9	1,537	3,484	1	5,022	3,302	570	3,875	1.17
1965	65,171	55,392	74.1	1,147	4,103	1	5,251	3,722	687	4,409	1.16
1966	66,347	57,002	73.1	842	4,168	1	5,011	3,698	487	4,184	1.24
1967	71,156	60,694	80.1	826	4,860	1	5,687	3,885	633	4,518	1.03
1968	65,126	55,980	79.5	1,169	4,450	1	5,620	3,966	536	4,502	1.08
1969	64,264	54,574	85.9	1,118	4,687	1	5,806	4,189	612	4,801	1.16
1970	66,863	57,358	72.4	1,005	4,152	4	5,161	3,978	517	4,495	1.33
1971	74,179	64,123	88.1	667	5,646	1	6,314	4,392	796	5,187	1.08
1972	67,126	57,513	97.0	1,127	5,580	1	6,708	4,742	1,258	6,000	1.57
1973	72,253	62,143	91.3	708	5,671	1	6,380	4,653	1,243	5,896	2.55
1974	77,935	65,405	71.9	484	4,701	2	5,187	3,677	1,149	4,826	3.02
1975	78,719	67,625	86.4	558	5,841	2	6,401	4,090	1,678	5,767	2.54
1976	84,588	71,506	88.0	633	6,289	3	6,925	4,133	1,657	5,789	2.15
1977	84,328	71,614	90.8	1,135	6,505	3	7,643	4,298	1,909	6,207	2.02
1978	81,675	71,930	101.0	1,436	7,268	1	8,705	4,872	2,124	6,996	2.25
1979	81,394	72,400	109.5	1,710	7,928	1	9,639	5,189	2,415	7,604	2.52
1980	84,043	72,961	91.0	2,034	6,639	1	8,675	4,875	2,408	7,283	3.11
1981	84,097	74,524	108.9	1,392	8,119	1	9,512	4,966	2,010	6,975	2.50
1982	81,857	72,719	113.2	2,537	8,235	1	10,772	5,415	1,834	7,249	2.68
1983	80,217	51,483	81.1	3,523	4,175	3	7,701	4,793	1,902	6,694	3.25
1984	80,543	71,915	106.7	1,006	7,674	4	8,684	5,170	1,865	7,036	2.62
1985	83,348	75,134	118.0	1,648	8,865	11	10,524	5,245	1,241	6,486	2.35

¹Revised data, 1979-82

²Marketing year beginning October 1, 1960 to 1974; September 1 marketing year 1975 to date.

³Grain and grain equivalent of corn products.

Table 23.—Soybeans: Area, yield, supply, disappearance, and prices, 1960-85¹

Year beginning June 1	Area (1,000 acres)		Yield per harvested acre (bu)	Supply (M bu)		Disappearance (M bu)		Crushed for oil (M bu)	Prices received by farmers (dol per bu)		
	Planted	Harvested		Beginning stock	Production	Total	Domestic use			Total	
1960	24,440	23,655	23.5	51.8	555.1	606.9	445.1	134.7	579.8	406.1	2.13
1961	27,767	27,003	25.1	27.1	678.6	705.7	477.9	149.4	627.4	431.4	2.28
1962	28,418	27,608	24.2	78.3	669.2	747.5	521.0	180.5	701.5	472.8	2.34
1963	29,462	28,615	24.4	46.0	699.2	745.2	490.7	187.2	677.9	436.8	2.51
1964	31,721	30,793	22.8	67.3	700.9	768.2	526.3	212.2	738.5	479.0	2.62
1965	35,227	34,449	24.5	29.7	845.6	875.3	569.1	250.6	839.7	537.5	2.94
1966	37,294	36,546	25.4	35.6	928.5	964.1	612.4	261.6	874.0	559.4	2.75
1967	40,819	39,805	24.5	90.1	976.4	1,066.6	633.7	266.6	900.2	576.4	2.49
1968	42,265	41,391	26.7	166.3	1,107.0	1,273.3	659.7	286.8	946.4	605.9	2.43
1969	42,534	41,337	27.4	326.8	1,133.1	1,460.0	797.5	432.6	1,230.1	737.3	2.35
1970	43,082	42,249	26.7	229.8	1,127.1	1,356.9	824.4	433.8	1,258.2	760.1	2.85
1971	43,476	42,705	27.5	98.8	1,176.1	1,274.9	786.1	416.8	1,202.9	720.4	3.03
1972	46,866	45,683	27.8	72.0	1,270.6	1,342.6	803.5	479.4	1,282.9	721.8	4.37
1973	56,549	55,667	27.8	59.6	1,546.5	1,607.2	897.3	539.1	1,436.4	821.3	5.68
1974	52,479	51,341	23.7	170.8	1,221.6	1,387.0	778.2	420.7	1,198.9	701.3	6.64
1975	54,590	53,617	28.9	188.2	1,548.4	1,735.5	935.5	555.1	1,490.6	865.1	4.92
1976	50,269	49,401	26.1	244.9	1,286.6	1,532.5	865.6	564.1	1,429.6	790.2	6.81
1977	58,978	57,830	30.6	102.9	1,767.3	1,865.7	1,003.2	700.5	1,703.7	926.7	5.88
1978	64,708	63,663	29.4	161.2	1,868.7	2,031.2	1,104.2	739.2	1,857.2	1,017.8	6.66
1979	71,411	70,343	32.1	176	2,261	2,437	1,204	875	2,079	1,123	6.28
1980	69,930	67,813	26.5	358	1,798	2,156	1,119	724	1,843	1,020	7.57
1981	67,543	66,163	30.1	313	1,989	2,302	1,119	929	2,048	1,030	6.04
1982	70,864	69,442	31.5	254	2,190	2,444	1,194	905	2,099	1,108	5.69
1983	63,779	62,525	26.2	345	1,636	1,981	1,062	743	1,805	983	7.81
1984 ²	67,735	66,093	26.2	176	1,861	2,037	1,123	598	1,721	1,030	5.78
1985 ³	63,130	61,584	34.1	316	2,099	2,415	1,139	740	1,879	1,053	5.10

¹Revised data, 1979-83²Preliminary³Estimated

Table 24.—Cotton (all kinds): Area, yield, supply, disappearance, and prices, 1964-85¹

Marketing year ¹	Area (1,000 acres)		Yield per harvested acre (pounds)	Supply (1,000 bales)			Disappearance (1,000 bales)		Prices received by farmers ³ cents per (pound)		
	Planted	Harvested		Beginning stock	Production		Domestic mill use ³	Exports			
					Imports	Total					
1964	14,836	14,055	517	12,351	15,145	118	27,614	9,261	4,195	13,456	31.0
1965	14,152	13,613	527	14,249	14,951	118	29,318	9,596	3,035	12,631	29.3
1966	10,349	9,553	480	17,028	9,557	105	26,690	9,574	4,832	14,406	21.7
1967	9,450	7,997	447	12,344	7,443	149	19,936	9,077	4,361	13,438	26.7
1968	10,912	10,159	516	6,584	10,926	68	17,578	8,332	2,825	11,157	23.1
1969	11,882	11,058	434	6,544	9,990	52	16,586	8,114	2,878	10,992	22.0
1970	11,945	11,155	438	5,843	10,192	37	16,072	8,204	3,897	12,101	22.9
1971	12,355	11,471	438	4,203	10,477	72	14,752	8,259	3,385	11,644	28.2
1972	14,001	12,984	507	3,258	13,704	34	16,996	7,769	5,311	13,080	27.3
1973	12,480	11,970	520	4,221	12,374	48	17,243	7,472	6,123	13,595	44.6
1974	13,679	12,547	441	3,808	11,540	34	15,382	5,860	3,926	9,786	42.9
1975	9,478	8,796	453	5,708	8,302	92	14,102	7,250	3,311	10,561	51.3
1976	11,636	10,914	465	3,681	10,581	38	14,300	6,674	4,784	11,458	64.1
1977	13,680	13,275	520	2,928	14,389	5	17,322	6,483	5,484	11,967	52.3
1978	13,375	12,400	420	5,347	10,856	4	16,207	6,352	6,180	12,532	58.4
1979	13,978	12,831	547	3,958	14,629	5	18,592	6,506	9,229	15,735	62.5
1980	14,534	13,215	404	3,000	11,122	27	14,149	5,891	5,926	11,817	74.7
1981	14,330	13,841	542	2,668	15,646	26	18,340	5,264	6,567	11,831	54.3
1982	11,345	9,734	590	6,632	11,963	20	18,615	5,513	5,207	10,720	59.4
1983	7,926	7,348	508	7,937	7,771	12	15,720	5,926	6,786	12,712	66.4
1984	11,145	10,379	600	2,777	12,982	25	15,784	5,365	6,250	11,615	65.8
1985 ⁴	10,685	10,229	630	4,102	13,432	33	17,567	6,399	1,969	8,359	65.8
1986 ⁵	9,591	8,909	539	9,348	10,006	10	19,364	7,010	6,750	13,760	7

¹Marketing year beginning August 1

²Adjusted to crop-year basis.

³Upland cotton, weighted season average price received by farmers

⁴Preliminary and estimated

⁵Forecast

⁶Average to April 1985 with no allowance for redeemed Loans.

⁷USDA is prohibited by law from publishing price forecasts

Table 25.—Cattle and calves: Inventory number, calf crop, disposition, production, and prices, 1960-85¹

Year	Inventory Jan. 1 ² (1,000 head)	Calf crop ³ (1,000 head)	Inshipments ⁴ (1,000 head)	Marketings ⁵ (1,000 head)		Farm slaughter ⁴ (1,000 head)	Deaths (1,000 head)		Production ⁶ (1,000 lb)		Price per 100 pounds (dollars)	
				Cattle	Calves		Cattle	Calves	Cattle	Calves	Cattle	Calves
1960	96,236	39,355	13,477	34,254	12,034	1,195	1,567	2,533	28,795,880	35,722,510	20,40	22,90
1961	97,700	40,180	14,761	35,138	11,898	1,218	1,532	2,488	29,902,448	36,821,343	20,20	23,70
1962	100,269	41,441	16,583	36,403	12,182	1,194	1,563	2,542	30,774,859	37,668,658	21,30	25,10
1963	104,448	42,268	16,182	37,863	11,916	1,213	1,580	2,460	32,776,777	40,033,778	19,90	24,00
1964	107,903	43,809	15,595	40,280	12,552	1,242	1,595	2,637	34,836,138	42,655,520	18,00	20,40
1965	109,000	43,928	17,464	43,482	12,603	1,196	1,641	2,607	34,002,808	44,623,119	19,90	22,00
1966	108,862	43,537	16,624	45,038	12,488	1,196	1,625	2,424	34,949,625	46,284,623	22,20	26,00
1967	108,783	43,803	18,597	44,781	12,385	622	1,533	2,512	36,122,064	46,684,824	22,30	26,30
1968	109,371	44,315	19,509	45,860	12,742	568	1,523	2,485	36,530,247	47,494,083	23,40	27,80
1969	110,015	45,177	19,942	45,559	12,598	486	1,532	2,591	37,146,953	47,194,719	26,20	31,60
1970	112,369	45,871	20,059	46,926	12,036	462	1,583	2,714	39,342,987	49,459,720	27,10	34,50
1971	114,578	46,738	22,673	49,143	12,086	456	1,634	2,608	39,534,379	50,685,799	33,00	36,40
1972	117,862	47,682	24,871	51,043	12,164	503	1,780	3,346	41,225,193	53,141,798	33,50	44,70
1973	121,539	49,194	24,133	48,369	11,652	570	2,099	4,388	44,231,455	51,022,731	42,80	56,60
1974	127,788	50,873	18,103	48,383	9,514	729	2,006	4,104	42,760,575	50,208,435	35,60	35,20
1975	132,028	50,183	20,095	54,331	12,253	750	2,396	4,596	40,678,016	54,877,016	32,30	27,20
1976	132,028	47,384	21,238	54,410	12,525	722	1,821	3,369	41,368,299	57,169,770	33,70	34,20
1977	122,810	45,931	23,241	56,342	12,722	700	2,000	4,000	40,829,023	58,426,941	34,50	36,90
1978	116,375	43,818	23,573	54,622	11,952	550	1,940	3,860	39,766,559	57,381,035	48,50	59,00
1979	110,864	42,596	22,322	48,358	10,151	430	1,900	3,700	38,803,335	51,874,758	66,10	88,70
1980	111,242	44,938	20,513	46,026	10,502	401	1,795	3,618	40,283,777	50,210,636	62,40	76,80
1981	114,351	44,666	18,914	46,647	10,383	398	1,700	3,359	41,178,209	50,896,754	58,60	64,00
1982	115,444	44,200	21,289	49,549	10,560	395	1,843	3,586	40,714,722	53,272,291	56,70	59,80
1983	115,001	43,925	19,210	48,089	10,443	410	1,877	3,617	40,301,302	51,990,001	55,50	61,70
1984	113,700	42,500	20,515	50,862	10,253	388	1,873	3,591	40,030,471	54,644,756	57,30	59,90
1985	109,749	41,045	19,323	48,739	10,488	370	1,701	3,350	39,946,992	53,901,402	53,70	62,10
1986	104,468											

¹Balance sheet estimates. Total of marketings, farm slaughter, deaths and onhand and of year equals total of births, inshipments, and onhand beginning of year. Includes Alaska and Hawaii beginning 1961.

²All cattle and calves.

³Excludes interfarm sales.

⁴Data for 1966 not comparable with previous years due to change in definition to include custom slaughtering in plants for farmers as part of the commercial meat production estimates beginning with January 1966. Combined beginning 1961.

⁵Adjustments made for inshipments and changes in inventory.

Table 26.—Hogs: Inventory numbers, pig crop, disappearance, and prices, 1960-85¹

Year	Inventory Dec. 1 ² (1,000 head)	Pig crop (1,000 head)	Inshipments (1,000 head)	Marketings ³ (1,000 head)	Farm slaughter ⁴ (1,000 head)	Deaths (1,000 head)	Production ⁵ (1,000 lb)	Marketings ³ (1,000 lb)	Price per 100 pounds (dollars)
1960	59,026	88,216	2,500	79,831	5,114	9,223	19,203,234	18,622,151	15.30
1961	55,560	92,713	2,293	80,326	4,639	8,984	20,166,822	18,917,418	16.60
1962	56,619	93,608	2,639	81,743	4,093	9,037	20,274,620	19,310,335	16.30
1963	57,993	94,056	2,657	86,163	3,795	7,991	20,960,460	20,273,936	14.90
1964	56,757	87,544	2,718	86,088	3,269	6,872	20,216,732	20,487,965	14.80
1965	56,106	78,941	2,364	78,127	2,678	6,089	18,252,141	18,426,743	19.60
1966	50,519	87,604	2,489	75,761	1,375	6,351	19,148,989	17,773,114	23.50
1967	57,125	91,668	2,855	85,258	1,301	6,273	20,636,444	19,948,881	19.10
1968	56,818	94,156	3,181	87,728	1,262	6,338	21,034,221	20,381,499	18.50
1969	60,829	88,676	3,092	88,074	1,134	6,343	20,600,325	20,708,223	22.20
1970	57,046	101,714	3,211	86,919	1,235	6,532	21,822,826	20,347,354	22.70
1971	67,285	97,924	3,639	98,644	1,210	6,584	22,832,335	23,147,614	17.50
1972	62,412	90,574	3,360	89,555	1,158	6,617	20,918,802	20,922,577	24.10
1973	59,017	88,123	3,902	82,419	1,095	6,914	20,154,425	19,606,900	38.40
1974	60,614	83,744	3,979	85,504	1,321	6,819	19,876,384	20,299,581	34.20
1975	54,693	71,186	3,806	73,959	1,193	5,631	16,798,843	16,980,920	46.10
1976	49,267	84,395	4,191	75,744	1,175	6,001	18,110,651	17,085,365	43.30
1977	54,934	86,162	4,258	80,917	1,145	6,754	19,124,424	18,409,468	39.40
1978	56,539	88,442	4,713	81,428	1,099	7,067	19,610,887	18,749,389	46.60
1979	60,356	102,792	5,003	92,499	1,070	7,265	22,617,129	21,485,876	41.80
1980	67,318	101,720	4,668	100,651	1,100	7,494	23,401,728	23,473,775	38.00
1981	64,462	93,853	4,147	95,986	895	6,883	21,812,966	22,258,979	43.90
1982	58,598	85,189	3,827	86,972	655	5,552	19,657,921	20,154,962	52.30
1983	54,534	93,155	3,527	89,129	517	4,875	21,195,347	20,834,899	46.80
1984	56,694	86,586	3,527	87,344	473	4,917	20,195,699	20,490,921	47.10
1985	54,073	86,006	3,593	86,583	446	4,345	20,132,944	20,326,433	44.00
1986	52,298								

¹Balance sheet estimates. Total of marketings, farm slaughter, deaths and onhand end of year equals totals of births, inshipments, and onhand beginning of year. Includes Alaska and Hawaii beginning 1981.

²All hogs and pigs. Beginning with 1985 number onhand is estimate as of December 1 previous year.

³Excludes meridian sales.

⁴Data for 1966 not comparable with previous years due to change in definition to include custom slaughtering in plants for farmers as part of the commercial meat production estimates beginning with January.

⁵Adjustments made for inshipments and changes in inventory.

Table 27.—Sheep and lambs: Inventory numbers, lamb crop, disposition, production, and prices, 1960-85¹

Year	Inventory Jan. 1 ² (1,000 head)	Lamb crop (1,000 head)	Inshipments (1,000 head)		Marketings ³ 1,000 head)		Farm slaughter ⁴ (1,000 head)		Deaths (1,000 head)		Production ⁵ (1,000lb)	Marketings ³ (1,000lb)	Price per 100 pounds (dollars)		
			Sheep	Lambs	Sheep	Lambs	Sheep	Lambs	Sheep	Lambs			Sheep	Lambs	
															Sheep
1960	33,170	21,012	608	5,491	3,572	19,068	119	222	2,458	2,132	1,628,014	2,083,980	5.60	17.90	
1961	32,725	20,782	541	5,391	3,992	19,632	118	229	2,430	2,062	1,646,105	2,178,264	5.20	15.80	
1962	30,969	19,712	636	5,198	3,788	18,783	113	218	2,430	2,007	1,490,722	2,074,148	5.63	17.80	
1963	29,176	18,516	620	4,962	3,720	17,956	113	212	2,268	1,889	1,393,141	2,002,402	5.76	18.10	
1964	27,116	16,994	736	4,838	3,437	16,757	107	193	2,265	1,797	1,330,507	1,860,420	6.00	19.90	
1965	25,127	16,312	5,165	4,679	2,454	15,213	294	222	2,199	1,711	1,217,139	1,639,762	6.34	22.80	
1966	24,734	15,881	4,679	2,785	2,785	14,674	268	268	1,940	1,674	1,249,097	1,651,261	6.84	23.40	
1967	23,953	15,017	4,030	2,911	2,911	13,993	245	245	1,960	1,649	1,153,596	1,603,247	6.35	22.10	
1968	22,223	14,443	4,035	2,298	2,298	13,448	237	237	1,789	1,580	1,166,190	1,487,480	6.58	24.40	
1969	21,350	13,723	4,119	2,282	2,282	12,873	233	233	1,826	1,556	1,065,074	1,446,504	8.10	27.20	
1970	20,423	13,465	4,032	1,983	1,983	12,840	249	249	1,638	1,478	1,099,385	1,435,918	7.52	26.40	
1971	19,731	12,998	4,004	2,202	2,202	12,627	236	236	1,482	1,446	1,070,502	1,447,047	6.56	25.90	
1972	18,739	12,599	3,976	2,170	2,170	12,383	224	224	1,417	1,480	1,004,102	1,411,461	7.26	29.10	
1973	17,641	11,500	3,275	2,198	2,198	10,879	202	202	1,366	1,441	895,776	1,278,090	12.90	35.10	
1974	16,310	10,509	2,629	2,172	2,172	9,888	217	217	1,248	1,409	806,755	1,172,539	11.20	37.00	
1975	14,515	9,857	2,343	1,771	1,771	8,987	212	212	1,081	1,343	781,120	1,072,665	11.30	42.10	
1976	13,311	8,888	2,466	1,445	1,445	8,071	197	197	963	1,202	732,765	961,780	13.20	46.90	
1977	12,766	8,606	2,173	1,504	1,504	7,405	198	198	905	1,181	703,942	896,568	13.40	51.30	
1978*	12,322	8,020	2,151	1,470	1,470	6,606	174	174	905	1,117	696,929	856,668	21.70	62.70	
1979	12,365	7,974	2,143	1,347	1,347	6,336	172	172	867	1,063	704,593	806,765	25.70	66.70	
1980	12,699	8,257	2,216	1,395	1,395	6,743	166	166	894	1,026	746,343	854,830	21.30	63.60	
1981	12,947	8,820	1,985	1,510	1,510	7,103	189	189	818	1,035	772,382	885,634	21.20	54.90	
1982	12,997	8,580	2,115	1,124	1,124	7,358	195	195	815	1,060	785,425	1,017,918	19.50	53.10	
1983	12,140	8,209	1,838	1,120	1,120	7,140	171	171	934	1,060	767,553	966,515	15.70	53.90	
1984	11,487	7,788	1,859	1,821	1,821	7,007	141	141	792	929	694,116	944,552	16.40	60.10	
1985	10,443	7,381	1,692	1,610	1,610	6,456	135	135	544	839	691,230	872,602	23.90	67.70	
1986	9,932														

¹Balance sheet estimates. Total of marketings, farm slaughter, deaths, and onhand end of year equals total of births, inshipments, and onhand beginning of year. Includes Alaska beginning 1961. Hawaii not available.²All sheep and lambs.³Excludes interfarm sales.⁴Data for 1966 not comparable with previous years due to change in definition to include custom slaughtering in plants for farmers as part of the commercial estimates beginning with January 1966.⁵Adjustments made for inshipments and changes in inventory.⁶Excludes inventory and supply and disposition items for Alabama, Arkansas, Delaware, Florida, Georgia, Mississippi, Rhode Island, and South Carolina, and is comparable to other supply and disposition items for 1978. Actual Jan. 1, 1978, inventory is 12,369,000 head.

Table 28.—Milk: Supply, utilization, and prices, 1960-85¹

Year	Annual average number of milk cows ² (1,000 head)	Milk production per cow ³ (1,000 lb)	Supply (M lb)			Utilization (M lb)			Prices received by farmers for all milk (dol. per cwt)		Milk feed ratio ⁵
			stocks	Production	Imports	Total	Domestic disappearance ⁴	Export and shipments ⁴	Total	wholesale	
1960	17,515	7,029	4,167	123,109	604	127,880	121,451	1,029	122,480	4.21	1.17
1961	17,243	7,290	5,400	125,707	760	131,867	121,032	932	121,964	4.22	1.16
1962	16,842	7,486	9,903	126,251	795	136,949	123,075	1,718	124,793	4.09	1.11
1963	16,260	7,700	12,156	125,202	915	138,273	123,092	5,493	128,585	4.10	1.09
1964	15,577	8,059	9,688	126,967	830	137,485	124,741	7,454	132,195	4.15	1.12
1965	14,953	8,305	5,290	124,180	923	130,393	123,579	2,358	125,937	4.23	1.18
1966	14,071	8,522	4,456	119,912	2,791	127,159	121,092	1,208	122,300	4.81	1.30
1967	13,415	8,851	4,859	116,732	2,908	126,499	117,423	824	118,247	5.02	1.35
1968	12,832	9,135	8,252	117,225	1,780	127,257	118,852	1,771	120,623	5.24	1.47
1969	12,307	9,434	6,634	116,108	1,621	124,363	117,699	1,419	119,118	5.49	1.54
1970	12,000	9,751	5,245	117,007	1,874	124,126	117,333	960	118,323	5.71	1.53
1971	11,839	10,015	5,803	118,566	1,346	125,715	117,365	3,026	120,611	5.87	1.49
1972	11,700	10,259	5,104	120,025	1,694	126,823	119,178	2,147	121,325	6.07	1.52
1973	11,413	10,119	5,498	115,491	3,860	125,849	119,350	1,292	120,642	7.14	1.28
1974	11,230	10,293	5,207	115,586	2,923	123,716	116,672	1,158	117,830	6.33	1.22
1975	11,139	10,360	5,886	115,398	1,669	122,953	118,063	1,046	119,109	6.75	1.31
1976	11,032	10,894	3,844	120,180	1,943	125,967	119,231	1,027	120,258	9.66	1.37
1977	10,945	11,206	5,709	122,654	1,968	130,331	120,713	992	121,705	9.71	1.39
1978	10,803	11,243	8,626	121,461	2,310	132,397	122,690	978	123,668	10.58	1.53
1979	10,734	11,492	8,729	123,350	2,305	134,384	124,765	1,020	125,785	12.03	1.55
1980	10,799	11,891	8,599	128,406	2,109	139,114	125,167	988	126,155	13.05	1.46
1981	10,898	12,183	12,959	132,770	2,329	148,058	125,895	3,783	129,680	13.76	1.44
1982	11,011	12,306	18,378	135,505	2,477	156,360	130,695	5,611	136,306	13.59	1.54
1983	11,098	12,585	20,054	139,672	2,616	162,342	135,931	3,765	139,696	13.57	1.45
1984	10,833	12,506	22,646	139,450	2,741	160,837	139,899	4,234	144,133	13.45	1.42
1985	11,025	13,031	16,704	143,667	2,777	163,148	144,080	5,373	149,453	11.273	1.52

¹Supply-utilization data, milk equivalent, fat solids basis

²Average number on farms during the year, heifers that have not freshened excluded

³Excludes milk sucked by calves

⁴Includes sales for dollars, government-to-government sales P. L. 480, and AID programs

⁵Pounds of 16% protein ration equal in value to 1 pound of milk

Table 29.—Number of farms and land in farms, by States, June 1, 1984-86¹

State	Farms			Land in Farms		
	1984	1985	1986 ²	1984	1985	1986 ²
	<i>Number</i>			<i>1,000 Acres</i>		
Alabama	54,000	54,000	52,000	11,500	11,500	11,000
Alaska	650	680	670	1,560	1,450	1,410
Arizona	8,300	8,500	8,600	37,500	37,500	37,500
Arkansas	55,000	53,000	50,000	16,100	16,000	15,700
California	78,000	79,000	79,000	33,000	32,900	32,800
Colorado	27,000	26,600	26,600	34,600	34,400	34,200
Connecticut	4,100	4,000	3,800	480	480	450
Delaware	3,600	3,500	3,200	660	650	640
Florida	40,000	39,000	39,000	13,000	13,000	13,000
Georgia	51,000	50,000	49,000	13,500	13,500	13,000
Hawaii	4,600	4,600	4,400	1,950	1,950	1,950
Idaho	24,600	24,600	24,000	14,700	14,500	14,000
Illinois	94,000	90,000	87,000	28,700	28,700	28,700
Indiana	82,000	80,000	78,000	16,400	16,400	16,200
Iowa	113,000	111,000	109,000	33,600	33,600	33,600
Kansas	74,000	72,000	70,000	48,000	48,000	47,900
Kentucky	101,000	100,000	99,000	14,500	14,500	14,500
Louisiana	36,000	36,000	36,000	10,100	10,100	10,000
Maine	8,000	7,800	7,800	1,560	1,520	1,520
Maryland	17,800	17,500	17,000	2,700	2,600	2,500
Massachusetts	6,100	6,000	6,000	680	680	680
Michigan	63,000	62,000	61,000	11,400	11,400	11,300
Minnesota	101,000	96,000	93,000	30,400	30,400	30,000
Mississippi	50,000	48,000	46,000	14,200	14,100	14,000
Missouri	117,000	115,000	115,000	31,000	30,800	30,700
Montana	23,900	23,800	23,600	61,100	61,000	61,000
Nebraska	60,000	59,000	57,000	47,200	47,200	47,200
Nevada	2,600	2,500	2,400	8,800	8,800	8,800
New Hampshire	3,400	3,400	3,200	545	540	520
New Jersey	9,100	8,700	8,300	970	940	920
New Mexico	14,000	13,800	13,600	45,800	45,000	44,600
New York	47,000	44,000	42,000	9,400	9,100	8,700
North Carolina	79,000	76,000	73,000	11,000	10,800	10,800
North Dakota	35,500	34,000	33,000	41,000	40,900	40,700
Ohio	90,000	89,000	88,000	15,800	15,800	15,800
Oklahoma	73,000	71,000	71,000	33,000	33,000	33,000
Oregon	37,000	37,000	37,000	18,000	18,000	17,900
Pennsylvania	58,000	58,000	56,500	8,700	8,700	8,500
Rhode Island	750	750	750	73	73	73
South Carolina	28,000	27,500	27,500	5,600	5,500	5,500
South Dakota	37,000	36,500	36,000	44,500	44,500	44,500
Tennessee	97,000	98,000	96,000	13,400	13,400	13,000
Texas	187,000	177,000	160,000	136,800	135,500	134,000
Utah	14,000	13,900	13,700	11,800	11,600	11,400
Vermont	7,300	7,000	7,000	1,700	1,600	1,600
Virginia	56,000	54,000	50,000	9,700	9,600	9,600
Washington	38,000	38,000	38,000	16,100	16,100	16,000
West Virginia	22,000	21,000	21,000	3,800	3,600	3,600
Wisconsin	86,000	83,000	82,000	18,000	17,700	17,600
Wyoming	9,100	9,000	8,800	34,800	34,800	34,800
United States	2,328,400 ²	2,274,730 ²	2,214,420 ²	1,019,378 ²	1,014,383 ²	1,007,363 ²

¹A farm is a place as of June 1 that sells or could sell \$1,000 of agriculture products during the year.

²Preliminary.

**APPENDIX II.
METRIC CONVERSION CHART**

Measurement	To convert this	To this	Multiply by
LENGTH	inches	millimeters (mm)	25.4
	feet	centimeters (cm)	30.
	yards	meters (m)	0.91
	miles	kilometers (km)	1.61
	millimeters	inches	0.04
	centimeters	inches	0.4
	meters	yards	1.1
	kilometers	miles	0.6
WEIGHT	ounces	grams (g)	28.
	pounds	kilograms (kg)	0.45
	short tons	metric tons (t)	0.9
	grams	ounces	0.035
	kilograms	pounds	2.2
	metric tons	short ton	1.1
AREA	square inches	square centimeters (cm ²)	6.5
	square feet	square (m ²)	0.09
	square yards	square meters (m ²)	0.8
	square miles	square kilometers (km ²)	2.6
	acres	hectares (ha)	0.4
	square centimeters	square inches	0.16
	square meters	square yards	1.2
	square kilometers	square miles	0.4
	hectares	acres	2.5
	VOLUME	teaspoons	milliliters (ml)
tablespoons		milliliters (ml)	15.
fluid ounces		milliliters (ml)	30.
cups		liters (l)	0.24
pints		liters (l)	0.47
quarts		liters (l)	0.95
gallons		liters (l)	3.8
cubic feet		cubic meters (m ³)	0.03
cubic yards		cubic meters (m ³)	0.76
milliliters		fluid ounces	0.03
liters		pints	2.1
liters		quarts	1.06
liters		gallons	0.26
cubic meters		cubic feet	35.
cubic meters	cubic yards	1.3	
TEMPERATURE	Fahrenheit	Celsius (°C)	0.56 ¹
	Celsius	Fahrenheit	1.8 ²

Measurement	To convert this	To this	Multiply by
FARM PRODUCTS	pounds per acre	kilograms per	1.14
	short tons per acre.....	hectare (kg/ha).....	2.25
	kg/ha	metric tons per.....	0.001
		hectare (t/ha).....	
	kg/ha	pounds per acre	0.88
	t/ha	short tons per acre.....	0.44
	t/ha	kg/ha	1000.

¹ After subtracting 32.

² Then add 32.

1 BUSHEL OF . . .

- wheat, soybeans, potatoes = 60 lbs. \times .45 = 27 kg.
- corn, gr. sorg., rye, flaxseed... = 56 lbs. \times .45 = 25 kg.
- beets, carrots..... = 50 lbs. \times .45 = 23 kg.
- barley, buckwheat, peaches... = 48 lbs. \times .45 = 22 kg.
- oats, cottonseed..... = 32 lbs. \times .45 = 14 kg.

1 METRIC TON OF . . .

- wheat, soybeans, potatoes = 2,204.6 lbs. \div 60 lbs. = 36.74 bu.
- corn, gr. sorg., rye, flaxseed... = 2,204.6 lbs. \div 56 lbs. = 39.37 bu.
- beets, carrots..... = 2,204.6 lbs. \div 50 lbs. = 44.09 bu.
- barley, buckwheat, peaches... = 2,204.6 lbs. \div 48 lbs. = 45.93 bu.
- oats, cottonseed..... = 2,204.6 lbs. \div 32 lbs. = 68.89 bu.

APPENDIX III. GLOSSARY

ACREAGE ALLOTMENT. The individual farm's share, based on its previous production of the national acreage needed to produce sufficient supplies of a particular crop. Allotments apply only to peanuts, rice, extra long staple cotton and tobacco.

ADJUSTED BASE PERIOD PRICE. The average price received by farmers in the most recent 10 years, divided by the index (1910-14 = 100) of average prices received by farmers for all farm products in the same 10 years. Used in parity calculations.

AGRIBUSINESS. Producers and manufacturers of agricultural goods and services, such as fertilizer and farm equipment makers, food and fiber processors, wholesalers, transporters, and retail food and fiber outlets.

ANIMAL UNIT. A standard measure based on feed requirements used to combine various classes of livestock according to size, weight, age, and use.

AQUACULTURE. The propagation and rearing of aquatic species in a controlled or selected environment.

ATTAINABLE YIELD. Yields expected through the use of known technology. See YIELD, ECONOMIC MAXIMUM.

BASE PERIOD PRICE. The average price for an item in a specified time period used as a base for an index such as 1910-14, 1957-59, 1967, 1977.

BASIC COMMODITIES. Six agricultural crops (corn, cotton, peanuts, rice, tobacco, and wheat) declared by legislation as requiring price support.

BREEDING UNIT INDEX. A measure of a breeding herd, including the total number of female animals capable of giving birth, weighted by the production per head, in a base period.

CARRYOVER. The volume of a farm commodity not yet used at the end of a marketing year. It is the remaining stock carried over into the next year. Marketing years generally start at the beginning of the new harvest for a commodity and extend to the same time in the following year.

CASEIN. The major portion of milk protein. It is manufactured from skim milk and is usually marketed in dry form. Food grade casein is used in processed foods and industrial grade casein is used in making glue, paint, and plastics.

CASH GRAIN FARM. A farm on which corn, grain sorghum, small grains, soybeans, or field beans and peas account for at least 50 percent of the value of products sold.

CENSUS OF AGRICULTURE. A count taken by the Bureau of Census every 5 years of number of farms, land in farms, crop acreage and production, livestock numbers and production, farm

spending, farm facilities and equipment, farm tenure, value of farm products sold, farm size, type of farm, and so forth. Data is obtained for States and counties.

CLIMATE. The sum total of all atmospheric or meteorological influences, principally temperature, moisture, wind, and evaporation which combine to characterize a region and give it individuality by influencing the nature of its soils, vegetation, and land use.

COMPLEMENTARY IMPORTS. Agricultural import items not produced in appreciable commercial volume in the United States. Examples: Bananas, coffee, rubber, cocoa, tea, spices, and cordage fiber. See SUPPLEMENTARY IMPORTS.

CONSERVATION, SOIL. A combination of land use and practices to protect and improve soil productivity and to prevent soil deterioration from erosion, exhaustion of plant nutrients, accumulation of toxic salts, excessive compaction or other adverse effects. See LAND CAPABILITY and SOIL.

CONSERVATION TILLAGE. Any of several farming methods that provide for seed germination, plant growth, and weed control yet maintain effective ground cover throughout the year and disturb the soil as little as possible. The aim is to reduce soil loss and energy use while maintaining crop yields and quality.

CONSUMER PRICE INDEX. General measure of retail prices (goods and services) usually bought by urban wage earners and clerical workers. Includes prices of about 400 items, including food, clothing, housing, medical care, and transportation.

CONTOUR FARMING. Field operations such as plowing, planting, cultivating, and harvesting on the contour, or at right angles to the natural slope, to reduce soil erosion, protect soil fertility, and use water more efficiently.

CONTRACT PRODUCTION. Producing crops or livestock under an agreement to deliver specified goods and services in certain quantities and of certain quality at a later time.

COOPERATIVE. An enterprise or organization owned by and operated for the benefit of those using its services. In agriculture, such an organization is owned and used by farmers mainly to handle the off-farm part of their business: buying farm supplies, marketing their products, furnishing electric and telephone service, and providing business services at cost. Essential features are democratic member-user control, limited return on capital, operation at cost, with distribution of financial benefits to individuals in proportion to their use of the services made available by the cooperative, member-owner financing, and limited operations.

COOPERATIVE EXTENSION SERVICE. Educational work for

people outside of classrooms carried on by the States, usually through the resources of the land-grant colleges and universities in cooperation with the U.S. Department of Agriculture. The Extension Service staff, U.S. Department of Agriculture, represents the Department in conducting cooperative Extension work.

CORN-HOG RATIO. Number of bushels of corn that are equal (in value) to 100 pounds of live hogs; that is, the price of hogs per hundredweight divided by the price of corn per bushel. Can be calculated in terms of U.S. average prices received by farmers, prices received by farmers in a given area or on the basis of central market prices rather than farm prices. This ratio has exhibited both seasonal and cyclical movements.

CORPORATION FARM. A farm that is legally incorporated; can be of any size, including family farms.

COST OF PRODUCTION. The average amount in dollars per unit used in growing or raising a farm product, including all purchased inputs and sometimes including allowances for management and the use of owned land. May be expressed on a unit, a per-acre, or a per-bushel basis for all farms in an area or in the whole country.

COUNTY EXTENSION AGENT. A professional worker, jointly employed by the county, State Cooperative Extension Service, and the U.S. Department of Agriculture to bring agricultural and homemaking information to local people and to help them meet farm, home, and community problems. Also called extension agent, farm and home advisor, agricultural agent, extension home economist, and 4-H or youth agent. See COOPERATIVE EXTENSION SERVICE.

COVER CROP. A close-growing crop grown primarily to protect and improve soil between periods of regular crops, or between trees and vines in orchards and vineyards.

CREDIT, SUPERVISED. A technique of providing loans in adequate amounts combined with intensive supervision provided by a management supervisor to help family farmers achieve successful commercial farm operations.

CROSS-COMPLIANCE. A Government farm program term meaning that if a farmer wishes to participate in a program for one crop by meeting the qualifications for production adjustment payments and loans for that crop, the farmer must also meet the program provisions for other major program crops which the farmer grows.

CUSTOM WORK. Specific farm operations performed under contract between the farmer and the contractor. The contractor furnishes labor, equipment, and materials to perform the operation. Custom harvesting of grain, spraying and picking of fruit,

and sheep shearing are examples.

DEFICIENCY PAYMENTS. Funds paid to farmers when farm prices are below the target price arrived at by subtracting from the target price the higher of (1) the loan rate, or (2) the national average market price of a commodity during the first 5 months of the marketing year (or calendar year price for cotton). Generally, the Federal Government pays this difference to a farmer who qualifies (by meeting all farm program conditions) for that portion of the farmer's production specified in the farm program.

DIALDEHYDE STARCH. A chemical derivative of starch derived from cereal grains used to improve wet strength of paper products and tanning leather and for other purposes.

DISASTER PAYMENTS. Federal aid provided to farmers for feed grains, wheat, rice, and upland cotton when either: (1) planting is prevented or (2) crop yields are abnormally low because of adverse weather and related conditions.

DISK. A harrow or plow composed of circular plates arranged at an angle with the line of pull. Used to prepare soil for seeding. Also called disk plow, a plow composed of large circular plates. See HARROW.

DRYLAND FARMING. A system of producing crops in semi-arid regions usually with less than 20 inches of annual rainfall without the use of irrigation. In alternate years, part of the land will frequently lie fallow to conserve moisture.

ENZYMES. Substances produced by living cells that can bring about or speed up chemical reactions without undergoing change themselves.

EROSION. The loosening and movement of the solid material of the land surface by wind, moving water, ice, and landslides.

FALLOW. Cropland left idle during the growing season. It is usually tilled to control weeds and conserve moisture in the soil.

FAMILY FARM. A farm where the operator and the operator's family make most of the day-to-day management decisions, supply the equity capital, and supply a significant part of the labor needs.

FARM. Any place that has \$1,000 or more gross sales of farm products in the course of a year.

FARM OPERATOR. A person who operates a farm, either by doing or supervising the work and by making the day-to-day operating decisions.

FEDERAL LAND BANK ASSOCIATIONS. Local farmer-owned organizations through which farmers obtain long term (up to 40 years) loans on land. The associations are an integral part of the Farm Credit System, a lending group that supplies nearly one-third of the borrowed capital used by farmers and nearly two-thirds of the credit used by farmer cooperatives. The system's

lending institutions include Federal land banks for loans on land, production credit associations for short term and intermediate operating loans, and the banks for cooperatives for loans to cooperatives.

FEED GRAIN. Any of several grains and most commonly used for livestock or poultry feed, such as corn, sorghum, oats, and barley.

FERTILITY, SOIL. The quality that enables a soil to provide plant nutrients in the proper amounts and in the proper balance for the growth of specified plants, when other factors such as light, temperature, and the physical condition of the soil are favorable.

FERTILIZER. Any material used to supply nutrients for plants.

FOOD, FARM-PRODUCED. Food products originating on U.S. farms. These include processed products made mainly from farm-produced ingredients, as well as eggs, fresh fruits and vegetables, and other products sold to consumers without processing. Nonfarm foods are those not originating on farms, such as fish and imported foods.

FOOD GRAIN. Cereal seeds most commonly used for human food, chiefly wheat and rice.

FORWARD CONTRACTING. A method of selling crops before harvest by which the buyer agrees to pay a specified price to the grower for a portion, or all, of his or her crops.

4-H YOUTH PROGRAMS. Organized groups of young people (ages 9 to 19), through which the Cooperative Extension Service, the U.S. Department of Agriculture, and State land-grant universities carry on educational work in farming and homemaking projects, career development, citizenship, leadership, and other youth development activities. The H's stand for head, hand, heart, and health. See COOPERATIVE EXTENSION SERVICE.

FUNGICIDE. Any substance used to kill fungi, which are forms of plant life, often undesirable, that lack chlorophyll and are unable to make their own food.

FUTURES CONTRACT. An agreement between two people, one who sells and agrees to deliver and one who buys and agrees to receive a certain kind, quality, and quantity of product to be delivered during a specified delivery month at a specified price.

GREAT PLAINS. A level to gently sloping region of the United States which lies between the Rockies and approximately the 98th meridian, stretching from Canada to Mexico. The area is subject to recurring droughts and high winds. It consists of parts of the Dakotas, Montana, Nebraska, Wyoming, Kansas, Colorado, Oklahoma, Texas, and New Mexico.

GROSS FARM INCOME. Income which farm operators realize from farming. It includes cash receipts from the sale of farm products, Government payments, value of food and fuel produced and consumed on farms where grown, rental value of farm dwellings, and an allowance for change in the value of year-end inventories of crops and livestock.

HARROW. An implement set with spikes, springs, or disks used to pulverize and smooth soil. See DISK.

HARVESTED ACRES. Acres actually harvested for a particular crop, usually somewhat smaller at the national level than planted acres because of abandonment brought on by weather damage or other disasters or market prices too low to cover harvesting costs.

HERBICIDE. Any substance used to destroy or inhibit plant growth; mainly for killing weeds.

HOG-CORN PRICE RATIO. See CORN-HOG RATIO.

INCOME SUPPORT PAYMENT. See DEFICIENCY PAYMENTS.

INTEGRATION. The combination (under the management of one firm) of two or more of the processes in the production and marketing of a particular product. The processes are generally capable of being operated as separate businesses. Diversification, on the other hand, is the production of two or more farm products by one firm or farmer.

INTERNATIONAL COMMODITY AGREEMENT. An undertaking by a group of countries to exchange information on market conditions. Some agreements include substantive economic provisions aimed at stabilizing world prices, such as commitments on stocks and prices.

INTERNATIONAL TRADE BARRIERS. Regulations used by governments to restrict imports from other countries. Examples: Tariffs, embargoes, import quotas, and unnecessary sanitary restrictions.

LAND CAPABILITY. A measure of the suitability of land for use without damage. In the United States, it usually expresses the effect of physical land conditions, including climate, on the total suitability for agricultural use without damage. Arable soils are grouped according to their limitations for sustained production of the common cultivated crops without soil deterioration. Nonarable soils are grouped according to their limitations for the production of permanent vegetation and their risks of soil damage if mismanaged.

LAND-GRANT UNIVERSITIES. State colleges and universities started from Federal Government grants of land to each State to encourage further practical education in agriculture, homemaking, and the mechanical arts.

LAND-USE PLANNING. The decisionmaking process to determine the present and future uses of land. The resulting plan is the key element of a comprehensive plan describing the recommended location and intensity of development for public and private land uses such as residential, commercial, industrial, recreational, and agricultural. Implementing the plan is the applied phase.

LEGUME. A family of plants, including many valuable food and forage species, such as peas, beans, soybeans, peanuts, clovers, alfalfas, sweetclovers, lespedezas, vetches, and kudzu. They can convert nitrogen from the air to build up nitrogen in the soil. Many of the nonwoody species are used as a cover crop and are plowed under for improvement of the soil.

LIME, AGRICULTURAL. Materials usually composed of the oxide, hydroxide, or carbonate of calcium, or of calcium and magnesium. The most common forms used in agriculture are ground limestone, hydrated lime, burned lime, marl, and oyster shells.

LINTERS. The short fibers remaining on cottonseed after ginning. Too short for usual textile use, they are used for batting and mattress stuffing and as a source of cellulose.

LOAN RATE. The price per unit (bushel, bale, pound) at which the Government will provide loans to farmers to enable them to hold their crops for later sale.

MARKET BASKET OF FARM FOODS. Average quantities of U.S. farm foods purchased annually per household in a given period, usually a base period. Retail cost of these foods used as a basis for computing an index of retail prices for domestically produced farm foods. Excluded are fishery products, imported foods, and meals eaten away from home.

MARKETING ORDERS AND AGREEMENTS (FEDERAL). A means (authorized by, and based on, enabling legislation) to permit agricultural producers collectively to influence the supply, demand and/or price for a particular crop or commodity in order to improve the orderly marketing of the crop or commodity. Once approved by a required number of producers, usually two-thirds, of the regulated commodity, the marketing order is binding on all handlers of the commodity in the area of regulation. A marketing agreement may contain more diversified provisions, but it is enforceable with respect to those producers or handlers who voluntarily enter into the agreement with the Secretary of Agriculture.

MARKETING QUOTA. That quantity of a crop that will provide adequate and normal market supplies. This quantity is translated into terms of acreage needed to grow that amount and allotted among individual farms, based on their previous production of

that commodity. When marketing quotas are in effect (only after approval by two-thirds or more of the eligible producers voting in a referendum), growers who produce in excess of their farm acreage allotments are subject to marketing penalties on the "excess" production and are ineligible for Government price-support loans. For certain tobaccos, a poundage limitation is applicable as well as acreage allotments, when approved by grower referendum.

MARKETING RESEARCH. Research to provide the consumer with the highest quality agricultural products that are low cost and safe through new science and technology and to stimulate development, innovation, and testing of new concepts in marketing, transportation, processing, storage, and consumer services.

MARKETING SPREAD. The difference between the retail price of a product and the farm value of the ingredients in the product. This farm-retail spread includes the charges made by marketing firms for assembling, storing, processing, transporting, and distributing the products.

MARKETING YEAR. The year beginning at harvest time during which a crop moves to market. See CARRYOVER.

NATIONAL PROGRAM ACREAGE. The number of harvested acres of feed grains, wheat, cotton, and rice needed nationally to meet domestic and export use and to accomplish any desired increase or decrease in carryover levels. Program acreage for an individual farm is based on the producer's share of the national farm program acreage, except when an acreage reduction program has been announced.

NATIONAL FOREST. A Federal reservation dedicated to the protection and management of natural resources, under the concept of multiple use, for a variety of benefits including water, forage, wildlife habitat, wood, recreation, and minerals. National Forests are administered by the USDA Forest Service.

NATIONAL GRASSLAND. Land, mainly grass and shrub cover, administered by the Forest Service as part of the National Forest System for promotion of grassland agriculture, watersheds, grazing, wildlife, and recreation.

NATIONAL WOOL ACT. Legislation that provides price support for shorn wool at an incentive level to encourage production. The law also provides for a payment on sales of unshorn lambs.

NEMATOCIDE. Any substance used to kill parasitic worms called nematodes, abundant in many soils. Many nematodes attack and destroy plant roots.

NET FARM INCOME. The money and nonmoney income farm operators realized from farming as a return for labor, investment,

and management after production expenses have been paid. Farm income is measured in two ways: Net farm income before inventory adjustment and net farm income after inventory adjustment. Net farm income before inventory adjustment does not include changes in the value of inventories such as crops and livestock at the end of the year.

NITROGEN. A chemical element essential to life and one of the primary plant nutrients. Animals get nitrogen from protein feeds, plants get it from soil, and some bacteria get it directly from air.

NONFARM INCOME. Includes all income from nonfarm sources (excludes money earned from working for other farmers) received by owner-operator families residing on a farm and by hired farm labor residing on a farm.

NONMONEY FARM INCOME. A statistical allowance used in farm income compilations to credit farmers with income for the value of farm products used on the farm (instead of being sold for cash) and the rental value of farm dwellings. It assumes farmers otherwise live rent-free on their farm business premises.

NONRECOURSE LOANS. Price-support loans to farmers to enable them to hold their crops for later sale. Farmers may redeem their loans by paying them off with interest. The loans are nonrecourse because if a farmer cannot profitably sell the commodity and repay the loan when it matures, the pledged or mortgaged collateral (the commodity on which the loan was advanced) can be delivered to the Government for settlement of the loan.

NORMAL CROP ACREAGE. The normal acreage on a farm devoted to a group of crops designated by the Secretary of Agriculture. When in effect, a farm's total planted acreage of such designated crops plus any set-aside cannot exceed the normal crop acreage if the farmer wants to participate in the program(s).

NORMAL YIELD. A term designating the average historic yield established for a particular farm or area. Can also describe average yields. Normal production would be the normal acreage planted to a commodity multiplied by the normal yield.

OFF-FARM INCOME. Off-farm income includes wages and salaries from working for other farmers, plus nonfarm income, for all owner-operator families, regardless of where they live.

OILSEED CROPS. Primarily soybeans, peanuts, cottonseed, sunflower seeds, and flaxseed used for the production of edible and/or inedible oils, as well as high protein meals. Lesser oil crops are rape seed, safflower, castor beans, and sesame.

OILSEED MEAL. The product obtained by grinding the cakes, chips, or flakes that remain after most of the oil is removed from

oilseeds. Oilseed meals are mainly used as a feed stuff for live-stock and poultry. They are also used as a raw material in processing edible vegetable-protein products.

ONE-PERSON BALING. Use of field pickup hay balers, with self-tying attachments and bale ejectors, that allow one person to harvest hay crops.

PARITY PRICE. Price per bushel (or pound or bale) that would be necessary for a bushel today to buy the same quantity of goods (from a standard list) that a bushel would have bought in the 1910-14 base period at the prices then prevailing. Over-simplified, it would be the price per bushel of wheat that farmers would need today so as to buy a suit of clothes with the same number of bushels that it took in 1910-14.

PARITY RATIO. A measure of the relative purchasing power of farm products. The ratio between the index of prices received by farmers for all farm products and the index of prices paid by farmers for commodities and services used in farm production and family living. The parity ratio measures price relationships (prices received and prices paid). It does not measure farm income (units of production per acre and per animal have increased, and fewer farmers share total farm income). It does not measure the farmers' total purchasing power, because individual farms are larger, and total farm production is higher. It does not measure farmers' welfare to reflect off-farm income, Government payments, farmers' assets, and other factors.

PAYMENT LIMITATIONS. Limitations set by law on the amount of money any one person may receive in farm program payments each year under the feed grain, wheat, cotton, and rice programs.

PESTICIDE. A substance used to kill a pest. Pesticides include insecticides, fungicides, herbicides, and nematocides.

PHOSPHATE. A term commonly used to indicate a fertilizer which supplies phosphorus. A major element in fertilizers.

POTASH. A term commonly used to indicate a fertilizer which supplies potassium, an essential nutrient for plant growth. A major element in chemical fertilizers.

PRICE INDEXES. An indicator of the average price change for a group of commodities which compares prices for the same commodities in some other period, commonly called the base period. Monthly price indexes computed by the U.S. Department of Agriculture are the Index of Prices Received by Farmers and the Index of Prices Paid by Farmers for Commodities and Services, Interest, Taxes, and Farm Wage Rates, referred to as the Parity Index when expressed in the 1910-14 = 100 base.

PRICE SUPPORT LEVEL. The price for a unit of a farm commodity (bushel, pound) which the Government will support

through price support loans and/or payments. Price support levels are determined by law and are set by the Secretary of Agriculture.

PRICES-PAID INDEX. An indicator of changes in the prices farmers pay for goods and services (including interest, taxes, and farm wage rates) used for producing farm products and those needed for farm family living. Is referred to as the Parity Index when computed on a 1910-14 = 100 base. Also computes on a 1967 = 100 base.

PRICES-RECEIVED INDEX. A measure computed on the basis of prices farmers received usually at the farm or in small local markets.

PRODUCTION CREDIT ASSOCIATIONS. Lending groups, owned by their farmer-borrowers, that provide short and intermediate term loans for up to 10 years from funds obtained from investors in the money markets. The associations are an integral part of the Farm Credit System.

PRODUCTION EXPENSES. Total cash outlays for production. Capital expenses are figured on annual depreciation rather than on yearly cash outlays for capital items.

PRODUCTIVE CAPACITY. The amount which could be produced within the next season if all the resources currently available were fully employed using the best available technology. Productive capacity will increase whenever the available resources increase or the production of those resources increases. It describes the possibilities at one point in time, but is not fixed for all time. As real prices and profitability rise, the resources committed to agriculture and the adoption of new technology also rise.

PRODUCTIVITY. The relationship between the quantity of inputs (land, labor, tractors, feed, etc.) employed and the quantity of outputs produced. An increase in productivity means that more outputs can be produced from the same inputs or that the same outputs are produced with fewer inputs. Both single-factor and multifactor indexes are used to measure productivity. Single-factor measures examine the output per unit of one input at the same time other inputs may be changing. Multifactor productivity indexes consider all productive resources as a whole, netting out the effects of substitution among inputs. Crop yield per acre, output per workhour, and livestock production per breeding animal are all single-factor productivity indicators. The "Total Farm Output per Unit of Input" index is a multifactor measure.

PUBLIC LAW 480. A law passed by the Congress in 1954, often referred to as "P.L. 480" or the "Food for Peace" program. Primary purposes are to expand foreign markets for

U.S. agricultural products and use U.S. agricultural abundance to combat hunger and encourage economic development in the developing countries. The program makes U.S. agricultural commodities available at low interest, long term credit under Title I of the law, and as donations for famine or other emergency relief under Title II. Under Title I, the recipient country agrees to undertake agricultural development projects to improve its own food production or distribution.

PULPWOOD. Wood used in the manufacture of paper, fiberboard, and so on.

RANCH. An expression used mostly in the Western United States to describe a tract of land, including land and facilities, used for the production of livestock. Accepted western usage generally refers to the headquarters facilities, pastures, and other land as the ranch, as distinguished from range. Loosely defined, a ranch also may be a small western farm, such as a fruit ranch or a chicken ranch.

RENEWABLE NATURAL RESOURCES. Resources such as forests, rangeland, soil and water that can be restored and improved to produce the food, fiber, and other things humans need on a sustained basis.

RESOURCES. The available means for production. Land, labor, and capital are the basic means of production on farms.

ROTATION, CROP. The growing of different crops in recurring succession on the same land.

ROUGHAGE. Feed, such as hay and silage, with high fiber content and low total digestible nutrients.

SECTION 32. A section of Public Law 320 (approved August 24, 1935) which authorizes use of customs receipts funds to encourage increased consumption of agricultural commodities by means of purchase, export, and diversion programs.

SET ASIDE. A Government farm program term used to describe the acreage a farmer must devote to soil conserving uses (such as grasses, legumes, and small grain which is not allowed to mature) in order to be eligible for production adjustment payments and price-support loans.

SHARECROPPER. A tenant who shares crops, livestock, or livestock products with the landowner, who, in turn, often extends credit to and closely supervises the tenant. The sharecropper generally supplies only labor.

SILAGE. A crop that has been preserved in moist, succulent condition by partial fermentation in a tight container (silo) above or below the ground. The chief crops stored in this way are corn, sorghum, and various legumes and grasses. The main use of silage is in cattle feeding.

SOIL. A dynamic natural body on the surface of the earth

composed of mineral and organic materials and living forms in which plants grow. In the United States about 70,000 kinds of soil are recognized in the nationwide system of classification. Each has a unique set of characteristics and a unique potential for use.

STANDARD METROPOLITAN STATISTICAL AREA (SMSA).

A county or group of contiguous counties which contain at least one city of 50,000 inhabitants or more, or twin cities with a combined population of at least 50,000. In addition, contiguous counties are included in an SMSA if, according to certain criteria, they are socially and economically integrated with the central city.

STARCH. A complex carbohydrate found in most plant seeds, bulbs, and tubers.

STRIPCROPPING. Growing crops in a systematic arrangement of strips or bands to serve as vegetative barriers to wind and water erosion. See CONTOUR FARMING.

STUBBLE MULCH. A protective cover provided by leaving plant residues of any previous crop as a mulch on the soil surface when preparing for the following crop.

SUBSISTENCE FARM. A low-income farm where the emphasis is on production for use of the operator and the operator's family rather than for sale.

SUPPLEMENTARY IMPORTS. Farm products shipped into this country that add to the output of U.S. agriculture. Examples: Cattle, meat, fruit, vegetables, and tobacco. See COMPLEMENTARY IMPORTS.

SYNTHETICS. Artificially produced products that may be similar to natural products.

TALL OIL. A byproduct from the manufacture of chemical wood pulp. Used in making soaps and for various industrial products.

TARGET PRICES. A minimum level of prices determined by law to provide an economic safety net. Sometimes called the "guaranteed price level." The target price, based on costs of production, becomes the price support level at which the Government will bolster farm income by making price support payments to qualifying farmers when national average market prices fall below the target. See DEFICIENCY PAYMENTS.

TECHNOLOGY. Applied science.

TRACE ELEMENT. A chemical substance used in minute amounts by organisms and held essential to their physiology (magnesium, iron, copper, etc.).

UNIT COST. The average amount it takes in dollars to produce a single item. The total cost divided by the number of items produced.

UPLAND COTTON. A fiber plant developed in the United States from stock native to Mexico and Central America. Includes all cotton grown in the continental United States except Sea Island and American Pima cotton. Staple length of upland cotton ranges from 3/4 inch to 1-1/4 inches.

URBAN AND BUILT-UP AREAS. Cities, villages, and other areas of more than 10 acres used as industrial sites, railroad yards, cemeteries, airports, golf courses, shooting ranges, institutional and public administration sites, and similar areas.

WATERSHED. The total land area, regardless of size, above a given point on a waterway that contributes runoff water to the flow at that point. A major subdivision of a drainage basin. On the basis of this concept, the United States is generally divided into 18 major drainage areas and 160 principal river drainage basins containing some 12,700 smaller watersheds.

WATERWAY. A natural or artificially constructed course for the concentrated flow of water.

WHOLESALE PRICE INDEX. Measure of average changes in prices of commodities sold in primary U.S. markets. "Wholesale" refers to sales in large quantities by producers, not to prices received by wholesalers, jobbers, or distributors. In agriculture, it is the average price received by farmers for their farm commodities at the first point of sale when the commodity leaves the farm.

YIELD, ECONOMIC MAXIMUM. The most that can be produced on full efficient application of technology presently known by all farmers. Assumes there are no limitations on management, materials, equipment, capital, and experience.

APPENDIX IV. SELECTED REFERENCES

HOW TO ORDER

“SUBSCRIPTION ONLY” PERIODICALS

Prices of periodicals listed as being available through “Subscription Only” can be obtained by writing or calling the Superintendent of Documents. Do not send request or payment to the Department of Agriculture. Instead, send written order and remittance to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Remittances can be made by money order, or personal check; GPO also now accepts Master Charge and Visa credit cards at all of its bookstores, on mail orders sent to the Superintendent of Documents (Washington, D.C. 20402), and on phone orders placed by dialing area code (202) 783-3238. Currency is sent at sender’s risk. Foreign currency and postage stamps are not acceptable. Remittances from foreign countries should be made by international money order, or a draft on a U.S. or Canadian bank, payable to Superintendent of Documents. UNESCO Coupons are also acceptable from foreign countries.

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CROP REPORTING BOARD REPORTS

The Crop Reporting Board of USDA’s National Agricultural Statistics Service (NASS) estimates production, stocks, inventories, disposition, utilization, and prices of agricultural commodities. Publications issued by the Crop Reporting Board and its 44 State Statistical Offices are for sale. Information about ordering publications is available from the Crop Reporting Board, USDA, Room 5829-S, Washington, D.C. 20250, phone (202) 447-4020.

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ECONOMIC RESEARCH SERVICE REPORTS

All periodicals from the Economic Research Service are available on a paid subscription basis through the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The subscription prices listed for periodicals are subject to change without notice.

For an order form or additional details, contact: EMS Information, Room 228, New York Ave., N.W., USDA, Washington, D.C. 20005-4788, phone (202) 786-1494.

Following are some ERS publications available through the GPO:

AGRICULTURAL ECONOMICS RESEARCH, a quarterly

containing technical articles on methods and findings of research in agricultural economics. It includes interim reports on work in progress and articles on new areas of research. Each issue carries book reviews. Yearly subscriptions are \$5.00 domestic, \$6.25 foreign. Send request and remittance to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

OUTLOOK AND SITUATION reports analyze supply, demand, use, trade, and prices of major crops, livestock, and dairy and poultry products in text, tables, and charts. The series includes the following: OIL CROPS; VEGETABLE; WHEAT (three issues annually); RICE (two issues annually): \$5.00 domestic and \$6.25 foreign. FEED; COTTON AND WOOL; SUGAR AND SWEETENERS (three issues annually): \$5.50 domestic and \$6.90 foreign. AGRICULTURAL EXPORTS (quarterly): \$5.00 domestic and \$6.25 foreign. DAIRY (five issues annually): \$6.00 domestic and \$7.50 foreign. FRUIT; TOBACCO (quarterly): \$7.50 domestic and \$9.40 foreign. LIVESTOCK & POULTRY (quarterly): \$8.50 domestic and \$10.65 foreign. WORLD AGRICULTURE (quarterly): \$7.00 domestic and \$8.75 foreign. The 11 WORLD AGRICULTURE regional reports are \$21.00 domestic and \$26.25 foreign.

Annual reports include: AGRICULTURAL FINANCE and AGRICULTURAL LAND VALUES AND MARKETS. Prices are determined upon publication. Ordering details are available through Economics Management Staff information: (202) 447-2078.

AGRICULTURAL OUTLOOK report pools USDA's latest analyses of commodity supplies and demand, world agricultural trade, food marketing, farm inputs, agricultural policy, transportation and storage, and related developments, and provides USDA's official estimates of farm income and food prices.

Special articles range from international trade policies to U.S. land use and availability. Published 11 times a year and averaging 48 pages, including 6 pages of charts and 20 pages of statistical tables, at an annual subscription rate of \$25.00 domestic and \$31.25 foreign.

FOREIGN AGRICULTURAL TRADE OF THE UNITED STATES is a bimonthly statistical report on farm exports and imports. Each issue of about 90 pages contains short feature articles that highlight current developments in farm trade, international prices, food aid, and similar topics. Subscribers also receive two annual supplements containing trade data for the fiscal year and calendar year. Subscription price is \$21.00 domestic and \$26.25 foreign.

The ECONOMIC INDICATORS OF THE FARM SECTOR

series contains five reports that explore the economic status of U.S. farms and farm operator income and expenses. National and State Financial data summarizes farming's financial status. Production and Efficiency Statistics is keyed to changes in production, management, and labor practices. Farm Sector Review analyzes all economic accounts and marketing data for food and fiber. Costs of Production presents final average cost estimates for major agricultural commodities. The subscription price is \$9.00 domestic and \$11.25 foreign.

FARMLINE, published 11 times a year, provides broad coverage of major ERS research and analysis, with emphasis on how current agricultural economic developments affect U.S. farmers, business people, and consumers. Directed at a general audience, Farmline illuminates data and complex trends with striking charts that drive home key points. Subscription rate is \$24.00 domestic and \$30.00 foreign.

The **REPORTS** catalogue provides descriptions and prices of all current ERS publications, including monographs. To be placed on its mailing list, write to EMS Information, Room 237, 1301 New York Ave., N.W., USDA, Washington, D.C. 20005-4788.

NATIONAL FOOD REVIEW, a quarterly, covers developments, issues, and programs relating to food economics. Objective, in-depth articles detailing the latest ERS information are prepared for economists, nutritionists, educators, consumer advisors, food industry representatives, and others who need to keep posted on current developments in food economics. The annual subscription price is \$5.50 domestic and \$6.90 foreign.

RURAL DEVELOPMENT PERSPECTIVES, published three times a year (October, February, and June), bridges the gap between rural theory and practice. It presents the latest research results and ideas in a crisp nontechnical manner so rural practitioners can put them to work. Each issue contains 8 to 10 articles (mostly no more than 4 pages long), liberally illustrated with charts and photos, 40-48 pages per issue. Subscription price is \$5.00 domestic and \$6.25 foreign.

HANDBOOK OF AGRICULTURAL CHARTS provides charts covering agricultural subjects ranging from farm income to consumer costs and from commodities to trade. Revised annually. Order from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

WEEKLY WEATHER AND CROP BULLETIN, published by USDA and the National Oceanic and Atmospheric Administration (NOAA), is available domestically for \$25 per year and \$33 foreign airmail. Make check payable to Department of

Commerce, NOAA. This weekly publication of the two Departments summarizes weather and its effect on crops for the preceding week. Condensed summaries give both weather and farm progress for all States. Order Weekly Weather and Crop Bulletin, Room 5844-South Bldg., USDA, Washington, D.C. 20250.

HUMAN NUTRITION INFORMATION SERVICE REPORTS

The following reports on food composition and food consumption are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

COMPOSITION OF FOODS . . . Raw, Processed, Prepared, Agricultural Handbook No. 8(AH-8) costs \$7.00. Its revised sections are: DAIRY AND EGG PRODUCTS (AH-8-1) \$7.00; SPICES AND HERBS (AH 8-2) (out of print); BABY FOODS (AH 8-3) (out of print); FATS AND OILS (AH 8-4) \$7.00; POULTRY PRODUCTS (AH 8-5) \$9.50; SOUPS, SAUCES, AND GRAVIES (AH 8-6) \$8.00; SAUSAGES AND LUNCHEON MEATS (AH 8-7) \$6.00; BREAKFAST CEREALS (AH 8-8) (out of print); FRUITS AND FRUIT JUICES (AH 8-9) \$9.00; PORK PRODUCTS (AH 8-10) \$7.50; VEGETABLES AND VEGETABLE PRODUCTS (AH 8-11) \$16.00; NUT AND SEED PRODUCTS (AH 8-12) (out of print); BEEF PRODUCTS (AH 8-13) \$19.00; and BEVERAGES (AH 8-14) \$9.50.

FOODS COMMONLY EATEN BY INDIVIDUALS: Amount Per Day and Per Eating Occasion (HERR-44), priced at \$10.00, shows intakes of 200 commonly used foods and food groups by men, women, and children of different ages from Nationwide Food Consumption Survey (NFCS) 1977-78.

FOOD CONSUMPTION: HOUSEHOLDS IN THE UNITED STATES, SEASONS AND YEAR 1977-78, NFCS, Report No. 6, and comparable reports for the NORTHEAST (No. 7), NORTH CENTRAL REGION (No. 8), SOUTH (No. 9), and WEST (No. 10) are \$7.50 each. These reports provide detailed information on the quantities and money value of foods used in 1 week by survey households for the four seasons and for the year. The households are classified by urbanization and income.

DIETARY LEVELS: HOUSEHOLDS IN THE UNITED STATES, SPRING 1977, NFCS Report No. 11 is \$8.00. Comparable reports for the NORTHEAST (No. 11), NORTH CENTRAL REGION (No. 12), SOUTH (no. 13), and WEST (No. 14) are \$7.00 each. These reports give the nutritional content of the food used by the survey households.

FOOD INTAKES: INDIVIDUALS IN 48 STATES, YEAR 1977-78, Report No. I-2 (\$13.00) gives the nutritional content of these diets. **FOOD AND NUTRIENT INTAKES: INDIVIDUALS IN FOUR REGIONS, 1977-78**, Report No. I-3 (\$18.00) breaks down the data by four census regions.

The **CONTINUING SURVEY OF FOOD INTAKES BY INDIVIDUALS** gives up-to-date information on daily food intakes for 1985 and compares new data with information from the 1977 survey. Report No. 85-1 (\$4.25) gives information for a sample of **WOMEN 19-50 AND THEIR CHILDREN 1-5, 1 DAY, 1985**; Report No. 85-2 (\$9.50) covers a sample of **LOW-INCOME WOMEN 19-50 AND THEIR CHILDREN 1-5, 1 DAY, 1985**. Report No. 85-3 provides information for a sample of **MEN 19-50 YEARS, 1 DAY, 1985**. More reports for 1985 and for 1986 are planned.

The following nutrition publications are available from the Consumer Information Center, Pueblo, Colorado 81009:

NUTRITION AND YOUR HEALTH: DIETARY GUIDELINES FOR AMERICANS (Item 519R), published jointly by USDA and the U.S. Department of Health and Human Services, describes the generally agreed-upon principle of healthy eating. This bulletin is also available in Spanish (Item 180S). Both are free.

MAKING FOOD DOLLARS COUNT: NUTRITIOUS MEALS AT LOW COST (Item 419R) gives advice on purchasing, planning, and preparing meals on a limited income. There is a charge of 50 cents.

The following nutrition publications have been developed for the general public and are for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402:

DIETARY GUIDELINES AND YOUR DIET (HG-232-1-7) is a set of seven bulletins that show how to apply the Dietary Guidelines in everyday diets; the set costs \$4.50.

THRIFTY MEALS FOR TWO: MAKING FOOD DOLLARS COUNT (HG-244) gives advice on purchasing, planning, and preparing meals for the two-person household; cost is \$2.50.

YOUR MONEY'S WORTH IN FOOD (HG-183) shows how to buy food economically; it costs \$2.25.

CALORIES & WEIGHT (AIB-364) provides the calorie contents of many common foods; \$2.25.

NUTRITIVE VALUE OF FOODS (HG-72) provides values for 18 nutrients in commonly used household measures of more than 900 foods; it costs \$2.75.

FOREIGN AGRICULTURAL TRADE REPORTS

Foreign Agricultural Service (FAS) COMMODITY CIRCULARS are periodic reports on world production and trade of major commodities, including grain and feed, cotton, oilseeds and products, livestock and meat, dairy and poultry, horticultural products, seeds, coffee, sugar, tea, tobacco, and wood products. Send requests for price list to Information Division, Program and Policy Branch, Room 4644-S, Foreign Agricultural Service, U.S. Department of Agriculture, Washington, D.C. 20250.

FOREIGN AGRICULTURE is a monthly magazine for business firms selling U.S. farm products overseas. Includes current and background information useful to export marketing, including programs to expand U.S. agricultural exports. Yearly subscription prices are \$11.00, domestic, and \$13.75, foreign; single copies are \$1.25, domestic, and \$1.56, foreign. Order from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

INTERNATIONAL MARKETING PROFILES present detailed statistical information on agricultural trade activity by country or commodity. Information is included on market performance of specific agricultural products, market trends, export performance, and lists of foreign buyers. There is a charge for these reports. For an order blank and price information, contact Agricultural Information and Marketing Services, Room 4649-S, Foreign Agricultural Service, USDA, Washington, D.C. 20250.

WORLD PRODUCTION AND TRADE is a weekly summary of significant developments in world agricultural production and trade, emphasizing commodity developments of importance to U.S. agriculture and a weekly table of Rotterdam prices and levies. Available free to U.S. residents only. Send requests to Information Division, Room 5918-S, Media and Public Affairs Branch, Foreign Agricultural Service, USDA, Washington, D.C. 20250.

WORLD CROP PRODUCTION is a monthly report of USDA's production estimates for wheat, rice, coarse grains, oilseeds, and cotton in major countries and selected regions of the world. Subscription fee is \$18.00 domestic and \$25.00 foreign. Send request to Information Division, Program and Policy Branch, Foreign Agricultural Service, USDA, Washington, D.C. 20250.

EXPORT HANDBOOK FOR U.S. AGRICULTURAL PRODUCTS (No. 593, revised March 1985) provides the shipper of U.S. agricultural products with brief and well defined guidelines that include general shipping information, product selection, packaging, storage, handling, loading, and transport.

Product disorders that exporters and foreign receivers of U.S. farm products should be aware of also are covered. Order from Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Price: \$6.00.

AGRICULTURAL MARKETING SERVICE REPORTS

AMS FOOD PURCHASES, free. Issued weekly and quarterly. The weekly report summarizes all purchases and requests for offers for those commodities purchased by the Agricultural Marketing Service (AMS) for use in school lunch and other domestic feeding programs. Information includes names of contract awardees, shipping points and destinations, quantities purchased, costs, award ranges, and shipping periods for each product. The quarterly report covers the total quantity and expenditures for each commodity purchased during the preceding quarters of the fiscal year. The reports are published by the Office of the Deputy Administrator, Commodity Services, Room 3064-S, AMS, USDA, Washington, D.C. 20250. Telephone: (202) 447-5231.

MARKET NEWS REPORTS cover current prices, supply, demand, and trends for various commodities produced and marketed in different geographical locations. They are available by mail or on a paid subscription basis from the respective commodity divisions of the AMS. Subscription prices are subject to change without notice. For more information, contact Information Staff, AMS, USDA, Washington, D.C. 20250. Telephone: (202) 447-8998. Please state the commodities that interest you.

ANNUAL SUMMARIES

AGRICULTURAL STATISTICS, produced by the National Agricultural Statistics Service, USDA, can be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. A comprehensive statistical report containing current and historical data. Revised annually.

COMMODITY CREDIT CORPORATION CHARTS, limited quantities available; free upon request. Graphic and tabular summary of financial and program data for the preceding fiscal year. Send request to Information Division, Agricultural Stabilization and Conservation Service, USDA, Washington, D.C. 20250.

REPORT OF THE PRESIDENT OF THE COMMODITY CREDIT CORPORATION, free distribution to Members of Congress, with limited additional copies available. A statutory

report covering operations and financial condition of the Commodity Credit Corporation for the preceding fiscal year. Send request to Information Division, Agricultural Stabilization and Conservation Service, USDA, Washington, D.C. 20250.

U.S. TIMBER PRODUCTION, TRADE, CONSUMPTION, AND PRICE STATISTICS, 1950-85. An annual report that presents statistical information on the production, trade, consumption, and price of timber products in the United States. Copies are available from the Forest Service, USDA, Washington, D.C. 20250.

PERIODICALS

AGRICULTURAL RESEARCH, published 10 times a year by the Agricultural Research Service, USDA, reports results of research conducted by ARS scientists. Send requests for subscription information to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

EXTENSION REVIEW, published quarterly by the Extension Service, USDA.

Describes Extension program activities at Federal, State, and county levels. Send subscription orders to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Yearly subscription, \$14.00, domestic, \$17.50, foreign. Send single issue requests to ES Publications and Inquiries, Rm. 3431-S South Bldg., USDA, Washington, D.C. 20250.

FARMER COOPERATIVES, published monthly by the Agricultural Cooperative Service (ACS), USDA, Washington, D.C. 20250. It is issued free to cooperative members and those who work directly with cooperatives; otherwise, yearly subscriptions, \$18.00, domestic, \$22.50, foreign, upon request to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Free copies can be obtained from ACS. Carries feature articles about ACS technical assistance and research projects, discusses current cooperative issues, and reports significant actions of farmer cooperatives across the Nation.

FGIS UPDATE, free. Issued every other month. Provides timely summary of important activities of the Federal Grain Inspection Service (FGIS) to all who have an active interest in the grain industry. Send requests to be added to the mailing list to: Information Specialist, FGIS, USDA, Washington, D.C. 20250.

FOOD AND NUTRITION, published by the Food and Nutrition Service (FNS) to report on the Federal food assistance programs administered by FNS in cooperation with State and local agencies. The programs include the Food Stamp Program; the Food

Distribution Program; the National School Lunch Program and School Breakfast Program; the Child Care Food Program; the Summer Food Service Program for Children; the Special Supplemental Food Program for Women, Infants, and Children; and the Commodity Supplemental Food Program. Free distribution is limited to cooperating agencies at the State, county, or city level; professional groups working with school programs or low-income families; persons who can further disseminate food and nutrition information, including the general press and libraries. Single copies, \$2.50, domestic, \$3.50, foreign; yearly subscriptions, \$11.00, domestic, \$13.75, foreign. Send check or money order to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

FOOD NEWS FOR CONSUMERS, published by the Food Safety and Inspection Service (FSIS), and available by subscription only, \$9.50, domestic, \$11.90, foreign. Order from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

SOIL AND WATER CONSERVATION NEWS, published monthly by the Soil Conservation Service (SCS). Presents articles, in nontechnical language, about national, State, and local programs for conserving and developing land and water resources, and improving environmental quality. Domestic annual subscription, \$18.00, \$22.50, foreign. Single copies \$2.50, domestic, \$3.15, foreign. Send subscription orders to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Free distribution is limited to cooperators of the Department engaged in conservation activities, agricultural colleges and libraries, experiment stations, and similar institutions. Write to SCS, USDA, P.O. Box 2890, Washington, D.C. 20013.

APPENDIX V. USDA'S COMPUTERIZED INFORMATION SERVICES*

The U.S. Department of Agriculture offers two services to speed much of its information to the public.

One is the "EDI Service," designed for use by private information news services that rewrite or otherwise enhance the information and sell it to their own clients. EDI offers only perishable information, or news, at speeds up to 9600 baud and in bulk. Reports from several major USDA agencies are available by computer within minutes of their scheduled release times anywhere in the country and throughout the world.

"USDA Online," USDA's other service, is designed for "end users": newspapers, broadcast stations, and businesses. USDA Online offers a wide selection of the reports available through EDI and includes some additional databases and useful features. Reports are broken down so users can select small parts.

Reports from EDI vary in length from a few sentences to as much as 100 pages. EDI offers about 340 different categories of reports including press releases; crop, livestock, outlook and situation reports; trade leads; attache reports; analyses of commodity reports from extension offices in 16 States; reports from fruit and vegetable, livestock, cotton, poultry and other markets; boat and rail arrivals; a daily 2-page summary of top news stories about USDA and agriculture in general; and much more.

EDI provides five methods of capturing information: (1) Use of a dedicated line which allows the EDI computer to send the user's computer what the user wants as soon as USDA releases it, (2) automatic retrieval through an order list developed by the user, (3) automatic retrieval by report title, (4) selected retrieval of releases on the user's list, (5) and selected retrieval by menu browsing.

USDA agencies loading into EDI are the Agricultural Marketing Service, Agricultural Stabilization and Conservation Service, Economic Research Service, Extension Service, Foreign Agricultural Service, National Agricultural Statistics Service (including some of its State offices), Office of Governmental and Public Affairs and World Agricultural Outlook Board.

EDI rates are \$150 monthly minimum, \$12 per hour for

** For more information on these USDA computer information services, call (202) 447-5505, or write to Special Programs Division, Office of Information, OGPA, Room 536-A, Washington, D.C. 20250.*

connect time, and \$1.20 for each 100 lines of information taken. The service is generally accessible by a local telephone call. Some communications charges are involved.

USDA Online offers many of the reports mentioned above, plus databases on food and nutrition, agricultural trade, animal health, agricultural facts (including facts from this publication), a calendar of agricultural events and speaking engagements of USDA's top officials and an exhibits schedule, regional news releases and a listing giving names and telephone numbers of people at USDA to call for various information.

A USDA Online password also gives you access to "FEDNEWS," information offered by seven other Federal Departments and Agencies, including the Commerce Department's Census Bureau, the Health and Human Services Department's Food and Drug Administration, the Department of Housing and Urban Development, the Department of the Interior, and the National Aeronautics and Space Administration.

Still another related service is "FEDWIRE," consisting mainly of transcripts of such things as White House, Pentagon, State Department, and other press conferences or briefings, TV talk shows such as "The McNeil-Lehrer Report," "Meet the Press," and others. Rates for these services are available upon request.

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