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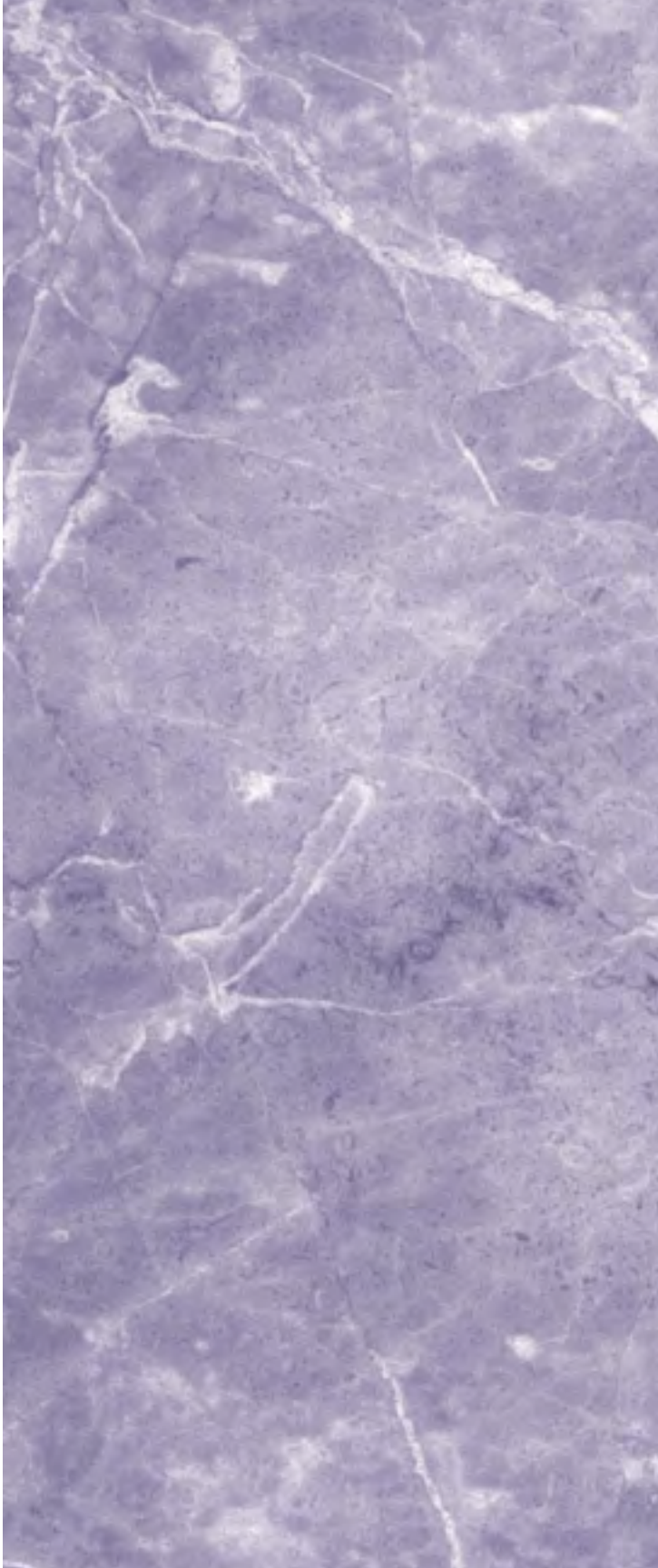

Agriculture Fact Book 1999

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Foreword

by Dan Glickman, Secretary

Providing information to the public is a core function of the U.S. Department of Agriculture. In fact, Abraham Lincoln created USDA in 1862 with the mission "to provide information about agriculture in the most comprehensive and general sense of the word." The ***Agriculture Fact Book*** helps fulfill that mission, offering thousands of useful facts about American agriculture and rural communities.

This ***Fact Book*** is also a handy reference tool that also describes USDA's varied programs. That includes not just our agricultural production programs--those that help American farmers and ranchers–but also the many other functions captured under our broad mandate. For example, many people probably do not realize that USDA:

- Leads national antihunger efforts, including food stamps, school meals, and the new Community Food Security Initiative;
- Provides national conservation assistance, helping protect soil, water, and wildlife on the 70 percent of American land that is privately held;
- Manages 192 million acres of forests and grassland through the Forest Service, which employs nearly half of USDA's workforce;
- Delivers housing, telecommunications, safe drinking water, and more to the Nation's rural communities;
- Protects the safety of all meat, poultry, and egg products;
- Conducts innovative research on new crop technologies, human nutrition, and conservation practices that allow us to grow more food and fiber using less water and less pesticides;
- Promotes open markets for U.S. agricultural products, and provides food aid to needy people overseas.

From production agriculture to the global marketplace and the corner store, from food safety to conservation, from managing our forests to administering the Nation's feeding programs, from supporting rural America to pursuing a wide-ranging research agenda, USDA touches your life every day.

Information about all of these USDA activities can be found here. However, this book is not the only USDA information source. Our award-winning Internet sites are insightful and easy to use. *www.usda.gov* is your gateway to an ever-widening universe of facts, statistics, and up-to-the-minute information.

We are also using information technology to deliver improved customer service. For example, our multimedia public outreach is powering efforts to:

- Let eligible people know that food stamps are available to help them feed their families;
- Collect public comments on USDA regulations, including those to establish a definition of organic food and establish a roadless policy for our national forests;
- Disseminate the 5th edition of the *Dietary Guidelines for Americans*;
- Promote the Millennium Green project, which is improving Americans' environment in urban, suburban, and rural areas by planting trees and gardens.

Whether you are a farmer, an exporter, a government official, a student, a scientist, or an interested citizen, I'm confident that you will find this book helpful. I hope that you will take advantage of the ***Agriculture Fact Book*** and the other information sources available from USDA.

1999 AGRICULTURE FACT BOOK

Millennium Milestones

As USDA looks toward the next century and millennium, we also look back to the rich past of American agriculture. The Millennium Milestones in this ***Agriculture Fact Book*** observe key historic markers that are the background leading up to some important issues that USDA faces every day–from production agriculture to nutrition, from soil surveys to food safety, from education to animal health, and from agricultural research to rural development. This look backward can help us to look forward with better awareness as we meet the challenges of the new millennium.

Soil Surveys

- 1830 Massachusetts became the first State to perform a soil survey.
- 1894 Secretary of Agriculture, J. Sterling Morton, establishes the Division of Agricultural Soils in its Weather Bureau; Milton Whitney is named as Chief of the Division.
- 1899 The National Cooperative Soil Survey established, creating a program of shared responsibilities and costs among Federal, State, and local soil districts.
- 1901 The Division of Soils is reorganized as the Bureau of Soils. 100 soil types had been identified, bearing names that combined information on the types' location and texture–such as Jordan sandy loam.
- 1904 400 soil types had been identified, and additional soil characteristics, including color and organic matter content, were adopted as bases for differentiating soil series.
- 1907 First use of official soil survey for land appraisal and tax assessment in Glenn County, CA. By 1912, this type of soil interpretation had received official recognition and support from the National Tax Association.
- 1909 715 soil types identified.
- 1911 The first USDA circular on soils, titled *Soils of the Eastern United States and Their Use*, published.
- 1912 1,650 soil types identified.
- 1920's Michigan uses soil survey data to plan road and highway development.
  - Soil erosion identified as serious threat to agricultural productivity.
  - Ten regional erosion experiment stations set up.
  - Increase in the quality and precision of the base maps, and the inception of aerial photography in soils mapping, increased the precision of plotting boundaries.
- 1930's Soil surveys used by the Bureau of Reclamation in planning large-scale irrigation and reclamation projects.
- 1935 Soil Conservation Act establishes a Soil Conservation Service (SCS) at USDA to carry out a continuing program of soil and water conservation.

- 1950's Soil survey finds increasing application in land use planning as the Nation urbanizes. Soil survey division samples soils internationally to test residual radioactivity resulting from above-ground nuclear testing.
- 1952 Secretary's Memorandum 1318 consolidated all soil survey work of the Department—including mapping, classification, correlation, interpretation, laboratory services, map compilation, and publication—and placed the activity in SCS.
- 1966 Public Law 89-560 gave firm authority to the soil survey to provide information for public and private entities for use in nonagricultural planning and resource development.
- 1985 Soil survey interpretations used to support land designations for the 1985 Farm Bill compliance provisions.
- 1990's The soil survey enters an era of dynamic, multilayered databases useful for site-specific analyses. The National Soil Information System (NASIS) becomes available as an online tool.

Nutrition Research and Nutrition Guidance

- 1796 Lemon juice introduced in British Navy to prevent scurvy.
- 1888 W.O. Atwater named as Chief of the newly organized Office of Experiment Stations at USDA; he and others construct the first calorimeter.
- 1894 USDA publishes Farmers' Bulletin giving the first dietary recommendations (Specific vitamins and minerals have not been discovered.). Dietary guidelines will continue to be revised as the science base evolves.
- 1899 USDA publishes compilation of the composition of a large number of foods (forerunner of Handbook 8, classic tables of food composition).
- 1900 By the turn of the 20th century, scientists had identified protein, fat, and carbohydrates as the basic nutrients in food.
- 1902 Atwater linked dietary intake to health, noting that "the evils of overeating may not be felt at once, but sooner or later they are sure to appear–perhaps in excessive amount of fatty tissue, perhaps in general debility, perhaps in actual disease."
- 1912-24 Relationship identified between "accessory food factors" (vitamins) and dietary deficiency syndromes, such as scurvy and beriberi.
- 1913-16 Discovery of vitamins A and B.
- 1916 The first USDA food guide, *Food for Young Children*, appears, listing five groups (milk and meat, cereals, vegetables and fruits, fats and fatty foods, and sugars and sugary foods).
- 1917 USDA issued *How To Select Foods*—the first dietary recommendations for the general public—based on same five food groups.
- 1921 Guide released using same five food groups but adding suggested amounts of foods to purchase each week for the average family.
- 1921-24 Blindness in children shown to be a result of lack of vitamin A.
- 1922-27 With the implementation of a statewide prevention program, the goiter rate in Michigan fell from 38.6 percent to 9 percent.

- 1922 Vitamin D identified in cod liver oil.
- 1924 Iodine was added to salt to prevent goiter.
- 1930's The Federal Government developed food relief and food commodity distribution programs, including school feeding and nutrition education programs and national food consumption surveys.
- 1932 Vitamin C isolated from lemon juice.
- 1933 USDA publishes food plans at four cost levels to help people shop for food, including 12 major food groups, to buy and use in a week to meet nutritional needs.
- 1938 Amino acids classified as essential and nonessential.
- 1940's Fortification of milk with vitamin D was a critical step in rickets control. Pellagra virtually eliminated by enriching flour with niacin.
- 1941 President Franklin D. Roosevelt convened the National Nutrition Conference for Defense, which led to the first Recommended Dietary Allowances of nutrients and resulted in the issuance of War Order Number One, a program to enrich wheat flour with vitamins and iron.
- 1941 Evidence provided for the influence of prenatal diet on the health of the newborn infant.
- 1943 Basic Seven food guide released as the National Wartime Nutrition Guide (which was updated as National Food Guide in 1946).
- 1949 Framingham study of coronary heart disease risk factors begins, to identify contribution of diet to development of cardiovascular disease and the effect of elevated serum cholesterol on the risk for coronary heart disease.
- 1940's First simple daily nutrition guide published.
- 1956 USDA published new food guide, the Basic Four, that recommended minimum number of foods from the four food groups–milk, meat, fruits and vegetables, and grain products; it was widely used for the next 2 decades.
- 1970's Food and nutrition labeling and other consumer information programs stimulated the development of products low in fat, saturated fat, and cholesterol.
- 1977 *Dietary Goals for the United States*, published by Senate Select Committee on Nutrition and Human Needs, shifted focus of dietary guidance from obtaining adequate nutrients to avoiding excessive intake of some foods.
- 1979 Publication of *Food* began to address the role of fats, sugars, and sodium in risks for chronic disease. The Basic Four food groups addition of a fifth group–fats, sweets, and alcoholic beverages–targeted for moderation.
- 1980 USDA and the U.S. Department of Health and Human Services published first edition of *Nutrition and Your Health: Dietary Guidelines for Americans* (which has been revised every 5 years). This and subsequent editions form the basis of Federal nutrition policy and provide a consensus on what makes a healthy diet.
- 1990 Third edition of the *Dietary Guidelines* promotes healthful eating through variety and moderation, and suggests a goal of 30 percent or less of calories from fat and less than 10 percent of calories from saturated fat.

- 1990 Nutrition Labeling and Education Act of 1990 mandates use of nutrition information on virtually all packaged and processed foods.
- 1992 *Food Guide Pyramid* released.
- 1994 Nutrition Facts Label required to give consumers information on nutritional content of foods.
- 1995 New (fourth) edition of *Dietary Guidelines*, now mandated by law, was released.

Animal Health

- 1870 Foot-and-mouth disease, a severe, highly communicable viral disease of cattle, swine, sheep, goats, deer, and other ruminants, first reported in the United States. The disease spreads widely and rapidly, causing grave physical and economic consequences.
- 1882 Robert Koch discovered the bacterium that caused tuberculosis (TB) and demonstrated how it was transmitted, making it possible to diagnose the disease in cattle and facilitating the control and eradication of TB in animals.
- 1889 Bureau of Animal Industry researchers discovered the carrier of tick fever (also called cattle fever, Texas fever, and distemper of cattle). A microparasite causing Texas fever and its transmittal by cattle ticks caused a chronic health problem among southern cattle. This was the first disease to be identified in which a protozoan parasite was communicated to a mammalian species by an arthropod vector.
- 1892 Contagious bovine pleuropneumonia eradicated 49 years after its introduction into the United States. This slow-spreading contagious bacterial disease of cattle had caused severe loss of cattle and great economic harm.
- 1899 Improved method of anthrax inoculation helps eliminate this dangerous disease of warm-blooded animals (including human beings) that is caused by the spore-forming bacterium *Bacillus anthracis*.
- 1903 Hog cholera serum developed to combat a highly infectious viral disease of swine. Pigs were immunized using the serum from recovered pigs and a little of the blood of an acutely ill pig.
- 1910 35 States and territories required tuberculin testing of all entering cattle. Tuberculosis is a contagious disease of both animals and humans. In an effort to reduce TB in the children at Indian schools, the Bureau of Animal Industries began TB testing of dairy cattle herds on reservations in several States; in1910, 35 States enacted legislation to test every cow, in every herd, on every farm.
- 1929 Foot-and-mouth disease, a highly contagious viral disease of cattle, swine, sheep, goats, deer, and other ruminants, was eradicated from the United States.
- 1929 Fowl plague (a viral disease reclassified in 1950 as avian influenza) was eradicated from the United States.
- 1934 Glanders—a contagious, acute or chronic, usually fatal bacterial disease of horses—was eradicated from the United States.

- 1942 Dourine, an often chronic venereal disease of horses, was eradicated from the United States.
- 1943 The cattle fever tick, Boophilus, was eradicated from the Continental United States, and deaths of cattle from tick fever stopped. Texas fever was the first disease to be eradicated by eliminating the vector and the first major disease to be eradicated by using chemical agents directed at the vector.
- 1947 The United States began formal cooperation with Mexico to prevent spread of foot-and-mouth disease. Congress also established authority to cooperate with Mexico, Central American countries, Panama, Colombia, and Canada to control or eradicate other animal diseases.
- 1955 Sterile flies were used to control screwworm (a cattle pest that causes extensive damage to domestic livestock) by interrupting its ability to breed. Screwworms were eradicated from the entire Southeastern United States in 1959, and in 1966, they were eradicated in the Southwest and in the entire United States.
- 1959 Vesicular exanthema (VE) of swine was eradicated. This acute, highly infectious disease, first observed in California in 1932, became widespread in the United States in the 1950's. A vigorous campaign by USDA to eradicate the disease was successful.
- 1971 Eradication of Venezuelan equine encephalomyelitis (VEE), a mosquito-borne disease of all equine species that humans can also contract. After the disease entered southern Texas in 1971, Federal and State animal health officials, the U.S. military, and affected communities took swift action to control and eradicate this outbreak. Efforts included spraying 13 million acres for mosquitoes and vaccinating 2.8 million horses.
- 1973 Sheep scabies (Psoroptic mange), which had afflicted sheep husbandry for more than 2,000 years, was declared eradicated in the United States.
- 1974 Exotic Newcastle disease was eradicated after the destruction of nearly 12 million chickens. In 1971, a major outbreak of this contagious and fatal viral disease had occurred in commercial poultry flocks in southern California. Eradication efforts cost taxpayers $56 million, and the disease has not affected domestic chickens in the United States since that outbreak was eradicated in 1974.
- 1978 Hog cholera—a highly contagious viral disease of swine that had caused enormous losses to the hog industry—was eradicated from the United States after a 16-year effort by the industry and by State and Federal governments.
- 1985 Lethal avian influenza eradicated. This disease is an extremely infectious and deadly form of avian influenza virus. Eradication efforts of a 1983 and 1984 high pathogen avian influenza (HPAI) outbreak in eight Northeastern States involved destruction of more than 17 million birds and cost nearly $65 million.

- 18th century *Essays Upon Field Husbandry*, written by Jared Eliot (1685-1763) of Connecticut.
- 1785 Thomas Jefferson's *Notes on the State of Virginia* contained one of the finest detailed descriptions of agriculture in an American State and asserted the virtues of rural life.
- 1825-50 Some schools and colleges began to offer courses in agriculture and in sciences helpful to agriculture.
- 1855 Michigan and Pennsylvania passed legislation providing for establishment of Michigan Agricultural College and the Farmers High School, later Pennsylvania State College.
- 1862 The drive for agricultural education culminated in the passage of the Morrill Land Grant College Act, which provided grants of public land to every State to be sold to fund an institution of higher education.
- 1871 Cornell University College of Veterinary Medicine granted its first bachelor's degree.
- 1874 Chatauqua system of adult education founded in New York.
- 1877 The University of Illinois offered the world's first course in general bacteriology.
- 1890's Development of agricultural education in secondary schools begins in local areas and some States.
- 1890 Second Morrill Act funded land-grant colleges for blacks in States where 1862 land grants were segregated.
- 1900 First corn club for boys, forerunner of 4-H clubs.
- 1903 Seaman Knapp began boll-weevil demonstration project in Texas, an inspiration for extension education, along with mobile school project of Booker T. Washington and George Washington Carver of Tuskegee Institute.
- 1914 Smith-Lever Act passed establishing the Cooperative Extension Service system.
- 1924 Clark-McNary Act provided for forestry extension work.
- 1928 Future Farmers of America founded.
- 1935 Bankhead-Jones Agricultural Research Act more than doubled Federal support of extension work.
- 1941 Extension agents worked in every rural county in the country, including Alaska, Hawaii, and Puerto Rico.
- 1964 Federal antipoverty programs led to expansion of extension education programs to urban areas.
- 1975 University of Nebraska professors established AGNET, the Nation's first interactive computer network to exchange agricultural information. AGNET allowed users miles away to access economic and management information.
- 1977 Legislation authorized funds to conduct extension programs and activities, as well as research programs, at the 1890 institutions and Tuskegee Institute.
- 1994 The Equity in Educational Land-Grant Status Act of 1994 established 29 tribal colleges, providing an endowment fund and authorizing extension activities at these 1994 land-grant institutions.

Agricultural Production Technology

- 1793 Invention of cotton gin.
- 1794 Thomas Jefferson's moldboard plow tested.
- 1797 Charles Newbold patented first cast-iron plow.
- 1819 Jethro Wood patented iron plow with interchangeable parts.
- 1834 McCormick reaper patented.
- 1834 John Lane began manufacturing plows faced with steel saw blades.
- 1837 John Deere and Leonard Andrus began manufacturing steel plows.
- 1837 Practical threshing machine patented.
- 1841 Practical grain drill patented.
- 1844 Practical mowing machine patented.
- 1849 Mixed chemical fertilizers sold commercially.
- 1856 2-horse, straddle-row cultivator patented.
- 1862-75 Change from hand power to horses characterized the first American agricultural revolution.
- 1868 Steam tractors tested.
- 1869 Spring-tooth harrow for seedbed preparation appeared.
- 1870's Silos came into use.
- 1870's Deep-well drilling first widely used.
- 1874 Glidden barbed wire patented. Availability of barbed wire allowed fencing of rangeland, ending era of unrestricted, open-range grazing.
- 1884-90 Horse-drawn combine used in Pacific coast wheat areas.
- 1890-95 Cream separators came into wide use.
- 1910-15 Big open-geared gas tractors came into use in areas of extensive farming.
- 1930's All-purpose, rubber-tired tractor with complementary machinery came into wide use.
- 1942 Spindle cotton picker produced commercially.
- 1945-70 Change from horses to tractors and the adoption of a group of technological practices characterized the second American agriculture revolution.
- 1954 Number of tractors on farms exceeded the number of horses and mules for the first time.
- Late 1950's–1960's Anhydrous ammonia increasingly used as cheap source of fertilizing nitrogen.
- 1965 99 percent of sugar beets harvested mechanically.
- 1968 96 percent of cotton harvested mechanically.
- 1970's No-till agriculture popularized.

Government Programs and Policy

- 1776 George Washington suggested to Congress the establishment of a National Board of Agriculture.
- 1819 New York State Board of Agriculture set up by State legislature.
- 1820 Agriculture Committee established in U.S. House of Representatives.
- 1825 Agriculture Committee established in U.S. Senate.
- 1839 $1,000 appropriated for Patent Office work with agricultural statistics.
- 1853 New York appointed first State entomologist.
- 1862 USDA set up without Cabinet status "to acquire and to diffuse among the people of the United States useful information on subjects connected with agriculture in the most general and comprehensive sense of that word…"
- 1874 Georgia set up the first State Department of Agriculture.
- 1889 USDA raised to Cabinet status.
- 1890, 1891, 1906 Meat Inspection Acts establish Federal program for certifying safety and quality of meats.
- 1893 Office of Road Inquiry organized at USDA to run demonstration and education programs.
- 1897 Greater emphasis in Federal agriculture program given to plant exploration and to increasing agricultural production.
- 1900-1920's Federal role in regulating food safety and marketing grows with passage of Pure Food and Drug Act, Cotton Futures Act, Packers and Stockyards Act, and Grain Futures Act.
- 1906 Appointment of first county agricultural agent.
- 1922 Capper-Volstead Act encouraged the growth of rural cooperatives.
- Early 1930's First Federal assistance to school lunch programs.
- 1930 Unprecedented drought relief legislation enacted.
- 1933-40 New Deal legislation increased Federal involvement in agriculture through production control, price support, and marketing programs; credit; rural relief and resettlement; soil conservation; crop insurance; rural electrification; and other programs.
- 1935 Rural Electrification Administration organized at USDA to bring electricity to farms.
- 1939 Food stamp plan begun.
- 1949 Rural Telephone Loan program begun.
- 1956 Soil Bank Program authorized to expand conservation of fragile lands and help control production.
- 1957 Poultry Inspection Act added poultry to the list of products inspected by USDA.
- 1961 Public Law 480 extended and expanded to increase U.S. food assistance to developing countries.
- 1964 Food Stamp Act expanded earlier food stamp program and established it as a major form of Government assistance to the poor.
- 1965 Appalachian Regional Development Act established Appalachian Regional Commission, a model regional rural development program.

- 1966 President's Commission on Rural Poverty appointed to investigate conditions of the rural poor and recommend programs to alleviate poverty in rural areas.
- 1966 Child Nutrition Act established the School Breakfast Program and Special Milk Program.
- 1966-67 National Advisory Commission on Rural Poverty organized; it published *The People Left Behind*, calling attention to rural poverty.
- 1971 Rural Telephone Bank organized to finance rural telephone cooperatives.
- 1972 Rural Development Act established rural development as an important mission of USDA.
- 1973 Agriculture and Consumer Protection Act emphasized maintaining or increasing instead of controlling production, an unusual, and short-lived, goal for U.S. farm policy.
- 1975 Economic Research Service reports reversal of rural-to-urban migration during 1970-73.
- 1985 Food Security Act lowered Government farm supports, promoted exports, set up the Conservation Reserve Program, and established National Advisory Commission on Agricultural and Rural Development Policy.
- 1989 30 million acres retired under the Conservation Reserve Program.
- 1994 The Federal Crop Insurance Reform and Department of Agriculture Reorganization Act reorganizes USDA into mission areas and calls for closing or consolidating one-third of USDA's 3,700 field offices.
- 1996 Federal Agricultural Improvement and Reform Act reoriented farm programs to increase reliance on market signals by allowing flexibility in planting and by "decoupling" support payments from levels of production.

Highlights of USDA Agricultural Research

- 1863 First monthly crop report published by USDA.
- 1866 Division of Botany created to preserve herbarium material collected in various government expeditions.
- 1871 Division of Microscopy created.
- 1873 Washington navel orange introduced into California with trees secured from Brazil by USDA.
- 1875 Agricultural experiment stations established in Connecticut and California.
- 1884 Bureau of Animal Industry established.
- 1887 15 States had formally organized experiment stations.
- 1887 Hatch Experiment Station Act provides Federal funding to State experiment stations.
- 1888 First successful biological control of crop pest; Vedalia beetles imported from Australia to control fluted scale on citrus.
- 1891 First comprehensive list of animal and human parasites developed; today comprises more than 30 volumes.
- 1900 First methodical breeding of plants for disease resistance–wilt-resistant cotton.

- 1900-1910 George Washington Carver, director of agricultural research at Tuskegee Institute, pioneered in finding new uses for peanuts, sweet potatoes, and soybeans, thus helping to diversify southern agriculture.
- 1910 USDA domesticated the wild blueberry.
- 1910 Scientists demonstrated that pasteurization killed toxin-producing organisms in raw milk without destroying beneficial lactic acid bacteria.
- 1918 W.W. Garner and H.A. Allard discovered that relative day and night length control flowering, known as photoperiodism.
- 1923 Tobacco mosaic virus isolated; established that viruses cause many plant diseases.
- 1925 Purnell Act provided for experiment stations to pursue economic and sociological research.
- 1932 Use of carbon dioxide tested as a method to retard decay in fresh produce.
- 1937 Insect sterilization technique for mating disruption proposed by Edward F. Knipling.
- 1938 Agricultural Adjustment Act established four regional research centers to develop new uses for farm products.
- 1941 Deep vat fermentation developed in Peoria, Illinois, by Andrew Moyer, allowing mass production of penicillin.
- 1944 Beltsville small white turkey developed, progenitor of today's commercial turkeys.
- 1944 Discovery that plants use the red part of sunlight to launch growth changes.
- 1946 Technique developed to produce high-quality frozen orange juice concentrate.
- 1948 Time-temperature tolerance project developed nine principles for freezing vegetables–still the industry standard.
- 1950 Economical methods for producing dextran developed; first used as alternative to blood plasma in Korean War.
- 1950 First light-scattering instrument for measuring size of molecules designed.
- 1950's Process for making instant potato flakes developed.
- 1953 Agricultural Research Service created in major reorganization of USDA.
- 1953 Discovery of THPC, compound that imparts fire resistance to cotton fabrics.
- 1954 DEET (N,N-diethyl-m-toluamide) insect repellent developed.
- 1956 First nucleotide sequence of transfer ribonucleic acid (RNA) isolated and characterized.
- 1958 National Seed Storage Laboratory set up to provide long-term storage of plant germplasm.
- 1962 First commercial semi-dwarf cultivar of a cereal grain in North America produced, helping to launch the "Green Revolution."

- 1965 Durable press (permanent press) cotton textile developed.
- 1971 Viroids, the smallest known agents of plant disease, discovered by Theodor O. Diener.
- 1973 Super Slurper developed, a combination of starch and a synthetical chemical that absorbs hundreds of times its own weight in water.
- 1988 First transgenic farm animals born.
- 1989 First separation of living farm-animal sperm into male- and female-producing batches.
- 1990 Fat replacement for food—"Oatrim"—developed from carbohydrate fiber and natural enzymes.
- 1990's Biodegradable plastics developed with cornstarch.
- 1994 First genetic map of blueberry.
- 1997 Gel formulation of formic acid developed to control parasitic bee mites.
- 1998 First noninvasive live-animal test for prion disease, scrapie, invented.
- 1998 Bacterial microbe mixture, PREEMPT, developed for competitive exclusion of *Salmonella*.
- 1999 Technique developed to grow taxol-producing cells in tissue culture.
- 1999 Rapid test developed to identify antibiotic-resistant strain of *Salmonella*; reduced test time from 6 weeks to 2 hours.

Legal and Regulatory Actions on Food Safety

- 1860's Following the Civil War, foods began to be mass produced and marketed in the United States, which led to food safety concerns about the way foods were processed, handled, and packaged.
- 1880's USDA developed methods to detect food adulteration, paving the way for the Pure Food and Drug Act.
- 1891 Federal ante- and post-mortem meat inspection mandated for U.S. exports. The goal was to promote meat exports to countries by requiring certification of inspection that was comparable to that which the foreign country provided. U.S. firms could request inspection of meat for domestic markets, but the widespread use of this voluntary program was prevented by the limitation on appropriations.
- 1906 Upton Sinclair's novel, *The Jungle*, drew attention to unsanitary conditions in U.S. meat packinghouses.
- 1906 Five months after Sinclair's novel was published, the Federal Meat Inspection Act and the U.S. Federal Food, Drug, and Cosmetics Act were passed, establishing two separate administrations: the U.S. Department of Agriculture (USDA) for meat inspections, and the U.S. Food and Drug Administration (FDA) for inspections of all other foods. The Federal Meat Inspection Act established mandatory Federal inspection of all meats in interstate commerce and provided continuous inspection of successive stages of processing. The Pure Food and Drug Act prohibited misbranded and adulterated foods and drugs from interstate commerce, and provided for seizure of violative products and the imposition of criminal sanctions.

- 1938 The Food, Drug, and Insecticide Administration (later renamed the Food and Drug Administration) became a separate unit of USDA.
- 1938 Congress enacted the U.S. Federal Food, Drug, and Cosmetics Act (FDCA) extending earlier legislation. Under the FDCA, the safety, purity, and wholesomeness of the food supply is ensured primarily by provisions forbidding interstate commerce in "adulterated" food.
- 1947 Federal Insecticide, Fungicide, and Rodenticide Act enacted.
- 1952 In *Berger v. United States*, pickles held in open vats where pigeons were flying around were in violation of section 402(a)(4) of the FDCA and were condemned as adulterated, despite lack of direct evidence of pigeon contamination of vats or pickles. The courts required only that a food "may" have become defective.
- 1953 Congress gave FDA authority to inspect a plant, after written notice to the owner, without a warrant and without permission of the owner.
- 1957 In the 1950's, poultry consumption increased significantly, leading to enactment of the Poultry Products Inspection Act for poultry slaughter and processing.
- 1958 Food Additives Amendment of 1958.
- 1966 Fair Package and Labeling Act.
- 1967 Wholesome Meat Act.
- 1968 Wholesome Poultry Products Act.
- 1969 Good manufacturing practices regulations first adopted.
- 1970 Egg Products Inspection Act.
- 1974 In *American Public Health Association v. Butz, Salmonella* was ruled as a natural contaminant of food and not an adulterant that could be readily controlled.
- 1986 USDA's Processed Products Inspection Improvement Act eliminated daily Federal inspection of meat and poultry slaughter and processing plants. Federal inspection was increased at plants that were deemed to have higher health risks.
- 1990 Nutrition Labeling and Education Act.
- 1992 U.S. Ninth Circuit Court of Appeals overturned EPA's use of de minimus standard for pesticide cancer risk.
- 1993 The public interest group, Safe Tables Our Priority (S.T.O.P.), was formed by parents of children who had become ill or died from *E. coli* O157:H7 contamination in hamburgers.
- 1994 In *Texas Food Industry v. Espy*, the court ruled that *E. coli* O157:H7 is an adulterant. This meant that meat and poultry contaminated with *E. coli* O157:H7 must be destroyed.

- 1994 The Uruguay Round of the General Agreement on Tariffs and Trade was signed; it provides a framework for distinguishing protectionist regulations from legitimate Sanitary and Phytosanitary (SPS) measures by requiring all SPS measures to be science based.
- 1994 USDA required all raw (and partially cooked) meat and poultry products to carry a label explaining safe cooking, storing, and handling practices.
- 1995 The food code was revised in 1973 and, since 1995, will be updated annually because of improved information about foodborne pathogens and how to prevent associated illnesses.
- 1995 FSIS also introduced a process certification program. If a company can demonstrate that its new process will "significantly reduce" pathogens, then it can be certified.
- 1995 FDA promulgated a Hazard Analysis and Critical Control Point (HACCP) plan for seafood (*Federal Register*, December 18, 1995).
- 1996 FSIS requires that all meat and poultry slaughter and processing plants implement the pathogen reduction/HACCP system to identify hazards and critical control points in their particular production, processing, and marketing activities (*Federal Register*, July 25, 1996). HACCP focuses on identifying hazards and preventing pathogen contamination rather than detecting defective products.
- 1997 The National Food Safety Initiative has several components: a new early warning system for foodborne illness, outbreak coordination, risk assessment, bioscience research, maximizing inspections to support HACCP, improving food safety education, and a strategic plan for action.
- 1997 The Center for Science in the Public Interest petitioned FDA for warning labels about *Salmonella enteritidis* (SE) risks on shell egg cartons, and for HACCP programs on all egg-producing farms to control SE.
- 1998 New and proposed regulations for the safety of juice.
- 1998 New regulation for shell eggs.
- 1999 Regulatory guidelines cover *Listeria monocytogenes* contamination of ready-to-eat livestock and poultry products.

Statistical Profile of U.S. Farm Life

- 1893 42 percent of population lives on farms
- 1908 33 percent of population lives on farms, and 54 percent live in rural areas
- 1920 30 percent of the population lives on farms
- 1930 58 percent of all farms had cars; 34 percent had telephones, 13 percent had electricity
- 1933 10 percent of farms electrified; 26 percent of population lives on farms
- 1935 35 percent of farms electrified
- 1940 23 percent of population lives on farm; 43 percent of population lives in rural areas
- 1950 12 percent of population lives on farms
- 1954 70.9 percent of all farms had cars; 49 percent had telephones, 93 percent had electricity
- 1960 8 percent of population lives on farms
- 1970 26 percent of population lives in rural areas
- 1972 5 percent of population lives on farms
- 1975 90 percent of all farms had telephones; 98.6 percent had electricity
- 1979 99 percent of farms electrified
- 1982 3 percent of population lives on farms; 97 percent of farms have telephone service
- 1988 75 percent of U.S. counties, with 26 percent of population, are nonmetropolitan

1. U.S. Agriculture—Linking Consumers and Producers

What Do Americans Eat?

Consistent with dietary and health recommendations, Americans now consume a half more grain products and a fourth more fruits and vegetables per capita than they did in 1970, eat leaner meat, and drink lower fat milk. Moreover, a steady increase in the proportion of refined flour that is enriched (from 65 percent in 1970 to more than 90 percent today) and changes in flour-enrichment standards in 1974 and 1983, along with big increases in grain product consumption since 1984, have boosted per capita supplies of four of the nutrients lost in the milling process and approximately replaced by manufacturers—iron, niacin, thiamine, and riboflavin, and, since January 1, 1998, folate.

But contrary to recommendations, Americans are consuming record-high amounts of caloric sweeteners and some high-fat dairy products, and near-record amounts of added fats, including salad and cooking oils and baking and frying fats. Moreover, the hefty increase in grain consumption reflects higher consumption of mostly refined, rather than high-fiber, whole-grain products—less than 2 percent of the 150 pounds of wheat flour consumed per capita in 1997 was whole wheat flour. (Most nutrients lost during processing, including fiber, vitamins, minerals, and phytochemicals, are not restored to refined flour.)

A variety of factors are responsible for the changes in U.S. consumption patterns in the last 25 years, including changes in relative prices, increases in real (adjusted for inflation) disposable income, and more food assistance for the poor. New products, particularly more convenient ones, also contribute to shifts in consumption, along with more imports, growth in the away-from-home food market, expanded advertising programs, and changes in food-enrichment standards and fortification policy. Sociodemographic trends also driving changes in food choices include smaller households, more two-earner households, more single-parent households, an aging population, and increased ethnic diversity. An expanded scientific base relating diet and health, new *Dietary Guidelines for Americans* designed to help people make food choices that promote health and prevent disease, improved nutrition labeling, and a burgeoning consumer interest in nutrition also influence marketing and consumption trends.

USDA's Economic Research Service (ERS) estimates per capita food supplies, based on food disappearance data. Estimates of food for domestic human consumption usually are calculated by subtracting measurable uses such as exports, industrial consumption, farm inputs, and end-of-year inventories from total supply (the sum of production, beginning inventories, and imports). Accordingly, the data are indirect

measures of actual consumption. They may overstate what is actually eaten because they represent food supplies available in the market and do not account for waste. Food supply nutrient estimates are derived from the disappearance data by researchers in USDA's Center for Nutrition Policy and Promotion.

Per Capita Meat Supply Larger and Leaner. Now more than ever, we are a Nation of meat eaters—but we are eating leaner meat. In 1999, total meat consumption (red meat, poultry, and fish) amounted to 197 pounds (boneless, trimmed-weight equivalent) per person, 20 pounds above the 1970 level and 91 pounds above the average annual level for the 1930's, when effects of the Great Depression dampened consumption. Each American consumed an average of 18 pounds less red meat (mostly less beef) than in 1970, 35 pounds more poultry, and 3 pounds more fish and shellfish.

Nutritional concern about fat and cholesterol has encouraged the production of leaner animals, the closer trimming of outside fat on retail cuts of meat, the marketing of lower fat ground meat and processed meat products, and consumer substitution of poultry for red meat—significantly lowering the meat, poultry, and fish group's contribution to total fat and saturated fat in the food supply.

Red meat (beef, pork, lamb, and veal) accounted for 58 percent of the total meat supply in 1999, compared with 74 percent in 1970. By 1999, chicken and turkey accounted for 35 percent of the total meat consumed, up from 19 percent in 1970. Fish and shellfish accounted for 7 percent of total meat consumption in both years.

Per capita consumption of beef reached an all-time high of 89 pounds (boneless, trimmed-weight equivalent) in 1976 when beef supplies were at record levels because of liquidation of the Nation's beef herd. It dropped significantly in the late 1970's, remained flat in the early 1980's, and then, from a 1980's high of 75 pounds per capita in 1985, declined steadily to 61.5 pounds in 1993. In 1994-99, increasing supplies of beef and declining beef prices spurred a 2- to 3.5-pound increase in annual per capita consumption of beef.

Consumer concerns about cholesterol and saturated fat, inconsistent quality, and lack of convenience in preparation are behind the negative trend in beef demand. Beginning around 1960, in response to concerns about fat and cholesterol, beef producers began shifting production from the very fat English breeds like Hereford and Angus to the bigger, rangier, less fat, faster growing exotic breeds. This shift led to increasing inconsistency in the quality of beef—a less tender and less juicy product. By 1995, one of four steaks was considered too tough to chew, according to the 1995 National Beef Quality Audit. In addition, the mass entry of women into the paid labor force has drastically reduced consumption of beef roasts and other beef cuts requiring lengthy cooking times.

Beef has lagged behind poultry and pork in marketing value-added, convenience items. In January 1999, the beef industry launched a new advertising campaign that uses the familiar "Beef, It's What's for Dinner" tagline and aims to inform consumers and beef industry channels about a new trend—beef dishes that are fully cooked and ready to microwave and serve in 10 minutes. Such dishes include traditional beef favorites like pot roast, meat loaf, and beef ribs. In addition, in 1998, the beef industry funded new genetic research to improve beef tenderness.

In contrast, per capita consumption of chicken, which remained flat in the early 1970's, steadily increased from 26 pounds (boneless-weight equivalent) in 1975 to 54 pounds in 1999. Similarly, per capita consumption of turkey climbed from 6.5 pounds in 1975 to 14 pounds a year in 1999. The poultry industry has enjoyed great success, partly by catering to consumers. The industry has provided scores of new brand-name, value-added products processed for consumers' convenience, as well as a host of products for foodservice operators. Poultry has also benefited from its lower price relative to beef and health-related concerns about beef.

Year-to-year fluctuations in pork consumption are often quite large, but consumption has been fairly stable in the long run. In fact, annual per capita pork consumption averaged 47.6 pounds per person in 1970-74 and 47.7 pounds per person in 1995-99. The 1990's quantity, however, contained much more lean and much less fat. Through improved breeding and husbandry practices and greater trimming of outside fat on retail cuts, the pork industry has lowered the fat content of retail pork by more than 30 percent since the 1970's.

U.S. per capita seafood consumption for 1999 is estimated at 14.8 pounds, down from a record high of 16.1 pounds in 1987. Despite the 8-percent decline from the 1987 level, average consumption in 1999 was still 26 percent above 1970, even though seafood prices outpaced those of other protein sources during those years. The Consumer Price Indexes (CPI) for fish, red meat, and poultry climbed 481 percent, 223 percent, and 195 percent, respectively, from 1970 to 1998.

The next decade will undoubtedly bring more changes. Technological advances will mean a host of new products in the meat case. With little increase in overall consumption of meat products expected in the next decade, the beef, pork, poultry, and fish industries will try to capture a larger share of a stagnant market by offering more prepared products.

Long-Term Decline in Per Capita Egg Consumption Levels Off in the 1990's. Egg consumption has two components: shell eggs and egg products. Shell eggs are those eggs purchased in cartons in the grocery store. Egg products are eggs that have been processed and sold primarily to food manufacturers and foodservice operators in liquid or dried form. These pasteurized eggs reach consumers as ingredients of foodservice menu items and processed foods—such as pasta, candy, baked goods, and cake mixes—or directly as liquid eggs in grocery stores.

Between 1970 and 1989, total annual consumption of shell eggs and egg products steadily declined about 4 eggs per person per year, from 309 eggs to 237. During the 1990's, total egg consumption has leveled off, fluctuating between 234 and 249 eggs per person per year. The record high for U.S. per capita egg consumption was 421 eggs in 1945.

The decline in per capita egg consumption over the last few decades reflects two very different and somewhat counterbalancing trends: a dominating, nearly constant decline in consumption of shell eggs, and a partially offsetting growth in consumption of egg products during the 1980's and 1990's.

Shell-egg consumption dropped from 276 eggs per capita in 1970 to 178 in 1999. The average annual rate of decline in per capita shell-egg consumption was 4 eggs per year in the 1970's and 5 eggs per year in the 1980's. In the 1990's, the rate of decline in per capita consumption of shell eggs has slowed to less than 1 egg per year and is expected to slow even more.

Much of the decline in shell-egg consumption since 1970 was due to changing lifestyles (for example, less time for breakfast preparation in the morning as large numbers of women joined the paid labor force) and the perceived ill effects of the cholesterol intake associated with egg consumption. Total cholesterol in the U.S. per capita food supply declined 13 percent between 1970 and 1994, from 470 milligrams per person per day to 410 milligrams. Eggs contributed 39 percent of the total cholesterol in the food supply in 1970 and 34 percent in 1994.

Consumption of egg products has doubled since 1983, reaching 71 eggs per person by 1999. The growth period followed more than two decades of relatively constant consumption. Egg product consumption will continue to increase as consumers opt for more prepared foods.

Americans Drinking Less Milk, Eating More Cheese. In 1998, Americans drank an average of 24 percent less milk and ate 2-1/2 times as much cheese (excluding cottage types) as in 1970. Annual per capita consumption of milkfat from fluid milk products (beverage milks and yogurt) has declined by half since 1970 due to lower milk consumption and a trend toward lower fat milks. Americans cut their average consumption of fluid whole milk by two-thirds between 1970 and 1998, and nearly tripled their use of lower fat milks. But because of the growing yen for cheese and fluid cream products, the Nation failed to cut the overall use of milkfat.

Annual per capita consumption of beverage milk declined from 31 gallons in 1970 to less than 24 gallons in 1998. Consumption of soft drinks, fruit drinks and ades, and flavored teas displaced beverage milk in the diet. Big increases in eating away from home, especially at fast-food places, and in consumption of salty snack foods favored soft drink consumption.

The beverage milk trend is toward lower fat milk. While whole milk represented 81 percent of all beverage milk (plain, flavored, and buttermilk) in 1970, its share dropped to 35 percent in 1998. As a result, total beverage milk contributed 51 percent less fat to the average American's diet in 1998 than in 1970. In contrast, rising consumption of fluid cream products meant that they contributed two times as much milkfat to the average diet in 1998 as in 1970. (Per capita consumption of fluid cream products—half-and-half, light cream, heavy cream, eggnog, sour cream, and dips—jumped from 10 half pints in 1970 to 17 half pints in 1998.)

On balance, however, annual per capita consumption of milkfat from all fluid milk and cream products declined by 38 percent in 1970-98, from 9.1 pounds per person to 5.9 pounds. Of that 5.9 pounds, whole milk contributed 2.5 pounds; lower fat milks, 1.7 pounds; and fluid cream products, 1.7 pounds. Skim milk added 0.05 pound of fat to the average diet in 1997, and yogurt (most of which is reduced-fat or fat-free) added 0.09 pound of fat.

Average consumption of cheese (excluding full-skim American and cottage, pot, and baker's cheeses) increased 149 percent between 1970 and 1998, from 11.4 pounds per person to 28.4 pounds. Lifestyles that emphasize convenience foods were probably major forces behind the higher consumption. In fact, two-thirds of our cheese now comes in commercially manufactured and prepared foods (including foodservice) such as pizza, tacos, nachos, salad bars, fast-food sandwiches, bagel spreads, sauces for baked potatoes and other vegetables, and packaged snack foods. Advertising and new products—such as reduced-fat cheeses and resealable bags of shredded cheeses, including cheese blends tailored for use in Italian and Mexican recipes—also boosted consumption.

From 1970 to 1998, consumption of Cheddar cheese, America's favorite cheese, increased 67 percent to 9.7 pounds per capita. Per capita consumption of Mozzarella—the main pizza cheese—in 1998 was 8.7 pounds, 7-1/3 times higher than in 1970, making it America's second favorite cheese. Cream cheese (including Neufchatel) overtook Swiss in the 1980's to become America's third favorite cheese, at 2.3 pounds per person in 1998. Lower fat cheeses accounted for a fifth (reduced fat, 16 percent; nonfat, 4 percent) of supermarket sales for the 52 weeks ending July 11, 1998 (at 20 percent, that is down 2 percentage points from 2 years earlier), according to the International Dairy Foods Association. Lower fat cheeses make up a much smaller proportion of the total cheese used by food manufacturers and foodservice operators.

The Array of Fruit and Vegetable Choices Widens. As Americans increasingly embrace national health authorities' recommendation of consuming at least five fruits and vegetables a day, their array of choices continues to widen. Fresh-cut fruits and vegetables, prepackaged salads, locally grown items, and exotic produce—as well as hundreds of new varieties and processed products—have been introduced or expanded since the early 1980's. Supermarket produce departments carry over 400 produce items today, up from 250 in the late 1980's and 150 in the mid-1970's. Also, the number of ethnic, gourmet, and natural foodstores—which highlight fresh produce—continues to rise.

Consumers increasingly have more access to fresh, local produce as well. The number of farmers' markets reported to State agriculture departments has grown substantially throughout the United States over the last several decades, numbering around 1,755 at the end of 1993 and eclipsing 2,746 in 1998. Some analysts say that the total number of farmers' markets, including those not reported, is more than double that figure.

While the overall market for fruits and vegetables has expanded in the last 15 years, the mix has changed. Shifts have taken place among traditional produce items and between fresh and processed forms. Traditional varieties have lost market share to specialty varieties, and exotic produce has gained favor. For example, per capita consumption of iceberg lettuce fell by 4.4 pounds (or 15 percent) between 1989 and 1997, while per capita consumption of romaine and leaf lettuces increased 2.5 pounds (or 69 percent) during the same period. In addition, many specialty lettuces not yet

tracked in USDA's food supply database—such as radicchio, frisee, arugula, and red oak—gained in popularity in the last several years because of inclusion in fresh-cut salad mixes and in upscale restaurant menus. Annual consumption of fresh carrots jumped up 3-1/2 pounds per person between 1995 and 1997, to 12-1/2 pounds per person, with the introduction of packaged, ready-to-eat baby carrots, which are now a popular lunchbox and snack item.

Consumption of Added Fats and Oils Remains Near Record High. Americans' overriding nutrition concern in the mid-1990's with cutting dietary fat is apparent in the recent per capita food supply data, which show a modest decline since 1993 in the use of added fats and oils. Annual per capita consumption of added fats and oils declined 8 percent between 1993 and 1998, from a record-high 69.7 pounds (fat-content basis) per person to 64.9 pounds. However, average use of added fats and oils in 1998 remained about a fifth above the 1970 level. Added fats and oils include fats and oils used directly by consumers, such as butter on bread, as well as shortenings and oils used in commercially prepared cookies, pastries, and fried foods. Excluded is all fat naturally present in foods, such as in milk and meat.

Studies in the 1950's and 1960's showed that replacing saturated fatty acids and animal fat with polyunsaturated fatty acids lowered blood cholesterol levels. Consequently, diets high in polyunsaturated oils like corn and safflower oils were widely recommended for the prevention of heart disease. Within the added fats and oils group, animal fats declined a fourth from 1970 to 1998 on a per capita basis, and vegetable fats and oils increased roughly two-fifths. Per capita consumption of salad and cooking oils, most of which were high in polyunsaturated fatty acids, nearly doubled between 1970 and 1998, from 15 pounds to 28 pounds.

However, concern developed about the safety of polyunsaturated fatty acids, and interest in the health benefits of monounsaturated fatty acids also increased. Some research suggests that replacing saturated fats with polyunsaturated fats in the diet reduces low-density lipoprotein (LDL)—the harmful form of blood cholesterol—but also reduces protective high-density lipoprotein (HDL)—the so-called "good cholesterol." Meanwhile, replacing saturated fats with monounsaturated fats lowers LDL cholesterol but leaves HDL levels stable. In addition, polyunsaturated fatty acids are more easily oxidized than monounsaturated fatty acids, making them more likely to contribute to atherosclerosis (fatty deposits in the inner layer of the arteries). Monounsaturated fatty acids are the most common fat in foods, but they are particularly plentiful in olive oil, canola oil, almonds, and avocados. In the 1998 food supply, olive oil and canola oil together accounted for 12 percent of total salad and cooking oils, up from 2 percent in 1985. Canola oil also is used in some soft, liquid-oil margarines.

In 1993, health concern about trans-fatty acids (or trans-fats) hit newspaper headlines. Trans-fats are created when liquid oils are hydrogenated to make them more solid and stable at room temperature; they raise LDL cholesterol and lower beneficial HDL cholesterol levels, and are associated with increased risk of coronary heart disease. Hydrogenated fats are used in everything from margarines, shortenings, crackers, cookies, baked goods, and peanut butter to foods fried in fast-food eateries, fried snack foods, and even some soups, beans, and cereals. From 1993 to 1998, per capita consumption of margarine and shortening declined by a third and nearly a

sixth (17 percent), respectively. About 40 percent of the margarine on supermarket shelves today is the old-fashioned stick variety, with the other 60 percent made up of tub or liquid margarines. In 1970, most margarine was the stick variety. In general, the softer the margarine, the lower its percentage of partially hydrogenated oils, and thus the lower the amount of trans-fats.

The U.S. Food and Drug Administration (FDA) proposed in November 1999 that food manufacturers begin disclosing on nutrition labels the amount of trans-fats in prepared food products. Nutrition labels currently list the total grams of fat per serving of product, and that total does include trans-fats, but there is no separate line showing, as they do with saturated fats, the actual amount of trans-fats. By highlighting trans-fatty acids on food labels along with saturated fat, the FDA hopes that it will encourage Americans to vote with their shopping carts and avoid foods that are high in trans-fats and saturated fats. Including trans-fats on food labels is another way for the FDA to encourage food companies to alter ingredients, opting for more healthful alternatives. It could take about 2 years for any new rule to go into effect. Some food manufacturers have already reformulated their products to eliminate trans-fats and are now capitalizing on that fact as a marketing tool.

Grain Consumption Rises by Nearly Half Since 1970. Per capita use of flour and cereal products reached 200 pounds in 1997 from an annual average of 145 pounds in 1980 and 136 pounds in 1970. The expansion in supplies reflects ample grain stocks, strong consumer demand for variety breads and other instore bakery items, as well as grain-based snack foods, and increasing fast-food sales of products made with buns, doughs, and tortillas.

USDA's nationwide food consumption surveys confirm the food supply data, also indicating Americans are eating more grain products. Consumption of grain mixtures—such as lasagna and pizza—increased 115 percent between 1977-78 and 1994. Snack foods—such as crackers, popcorn, pretzels, and corn chips—soared 200 percent, and ready-to-eat cereals were up 60 percent. One of the biggest changes within the grain mixture group was the explosion of ethnic foods, especially Mexican foods. Mexican foods were consumed four times more often in 1994 than in the late 1970's. Yet Americans are still eating a serving or less a day of whole-grain foods, far below the minimum three per day the American Dietetic Association recommends.

Since January 1, 1998, all enriched grain foods—including ready-to-eat breakfast cereals, pasta, bread, rolls, flour, cakes, and cookies—have been fortified with folic acid (the synthetic form of folate, a B-vitamin). In an effort to see what effect this has had, researchers at USDA's Human Nutrition Research Center on Aging at Tufts University in Boston studied a group of mostly white, middle-aged residents of one Massachusetts town and looked at their blood levels of folic acid before and after the food fortification began. They found that average blood levels of folic acid doubled. Just under 2 percent still had folic acid deficiency, compared to 22 percent before the vitamin was added to food. That should reduce the risk of neural tube birth defects like spina bifida. It may also protect adults from heart disease and reduce the chances of cervical cancer in women. Folic acid is found naturally in legumes; liver; many vegetables, especially green leafy ones like spinach; citrus fruits and juices; whole-grain products; and eggs.

Average Consumption of Caloric Sweeteners Hits Record High. Americans have become conspicuous consumers of sugar and sweet-tasting foods and beverages. Per capita consumption of caloric sweeteners (dry-weight basis)—mainly sucrose (table sugar made from cane and beets) and corn sweeteners (notably high-fructose corn syrup, or HFCS)—increased 33 pounds, or 27 percent, between 1982 and 1998. In 1998, each American consumed a record average 154 pounds of caloric sweeteners. That amounted to more than two-fifths of a pound—or 53 teaspoonfuls—of added sugars per person per day in 1997. Of course, some of the 53 teaspoons of added sugars were lost or wasted in the food system or in the home. But even if we allow that as much as 40 percent of the supply of added sugars might be wasted, consumption would remain high—about 32 teaspoonfuls per person a day. USDA's Food Guide Pyramid suggests that people consuming 1,600 calories limit their intake of added sugars to 6 teaspoons per day. The daily suggested limit increases to 12 teaspoons for those consuming 2,200 calories, and to 18 teaspoons for those consuming 2,800 calories.

A striking change in the availability of specific types of sugar occurred in the past three decades. Sucrose's share of total caloric sweetener use dropped from 83 percent in 1970 to 42 percent in 1998, while corn sweeteners increased from 16 percent to 57 percent. All other caloric sweeteners—including honey, maple syrup, and molasses—combined to maintain a 1-percent share.

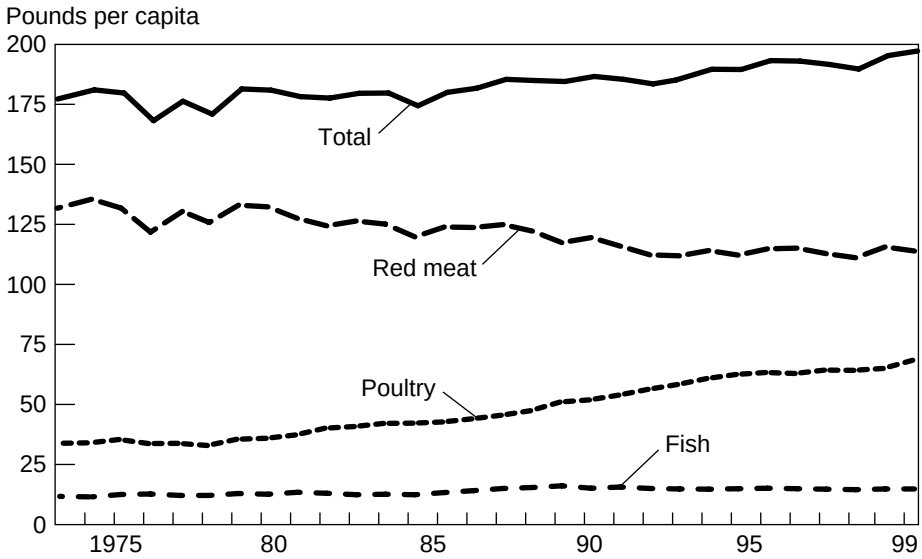
The steep rise in caloric sweetener consumption since the mid-1980's coincides with a 51-percent increase in annual per capita consumption of regular (nondiet) carbonated soft drinks, from 28 gallons per person in 1986 to nearly 43 gallons in 1998 (that is 14.9 ounces per person per day, an amount that contains more than 11 teaspoonfuls of sugar). Carbonated soft drinks provided more than a fifth (22 percent) of the refined and processed sugars in the 1994 American diet.

Sugar—including sucrose, corn sweeteners, honey, and molasses—is, in a sense, the number-one food additive. It turns up in some unlikely places, such as pizza, bread, hot dogs, boxed rice mixes, soup, crackers, spaghetti sauce, lunch meat, canned vegetables, fruit drinks, flavored yogurt, ketchup, salad dressing, mayonnaise, and some peanut butter.

The new food label, introduced in 1994, which lists the amount of sugars in grams (for example, 4 grams equal 1 teaspoon) in a serving of the food, can help people who are trying to moderate their sugar intake. This number includes both added sugars and those naturally present. Foods with natural sugars, such as milk and fruit, are also good sources of other nutrients, such as vitamins and minerals.

Figure 1-1.

Total per capita meat consumption in 1999 was 20 pounds above the 1970 level—a new record high



Boneless, trimmed equivalent.
Source: USDA/Economic Research Service.

Figure 1-2.

Beef is still America's most popular meat but chicken is gaining popularity

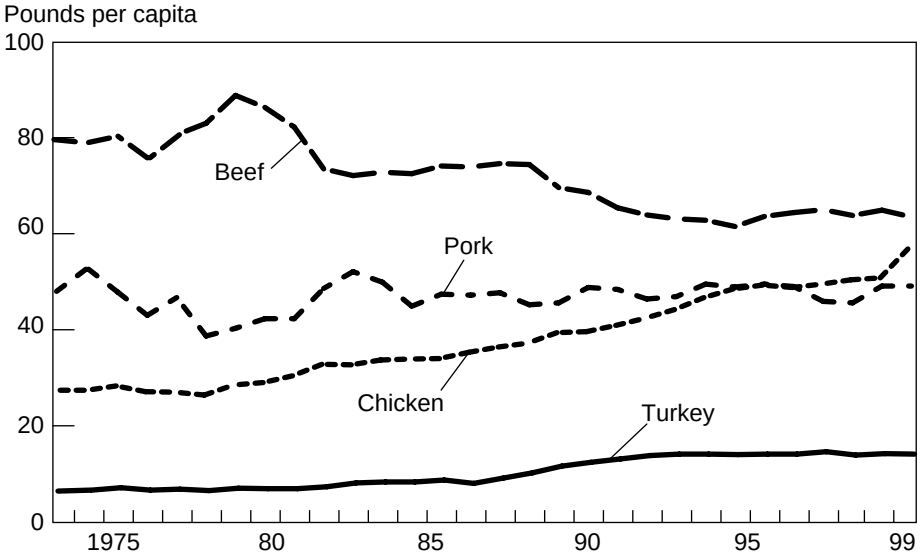
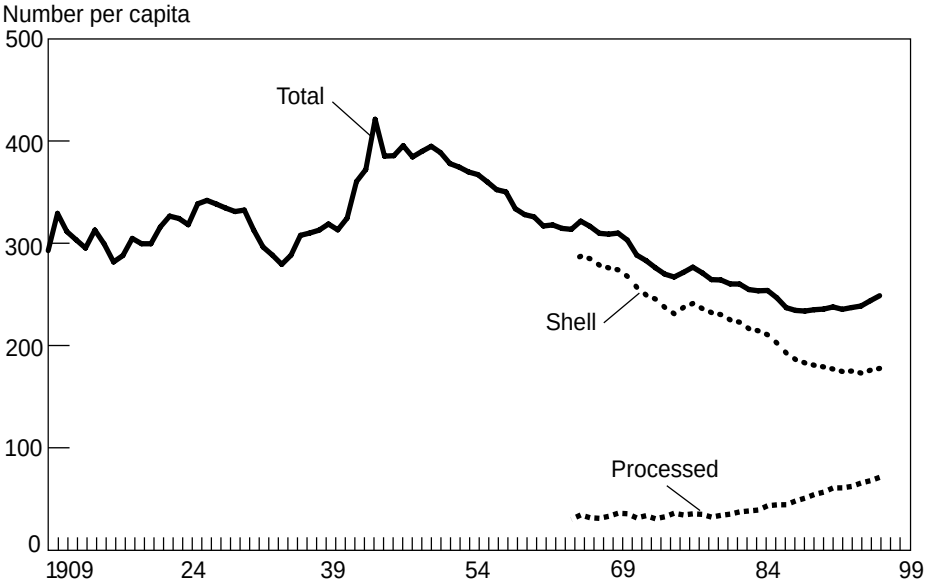


Figure 1-3.

Long-term decline in per capita egg consumption levels off in the 1990's



Source: USDA/Economic Research Service

Figure 1-4.

Per capita consumption of beverage milk declined 24 percent between 1970 and 1998

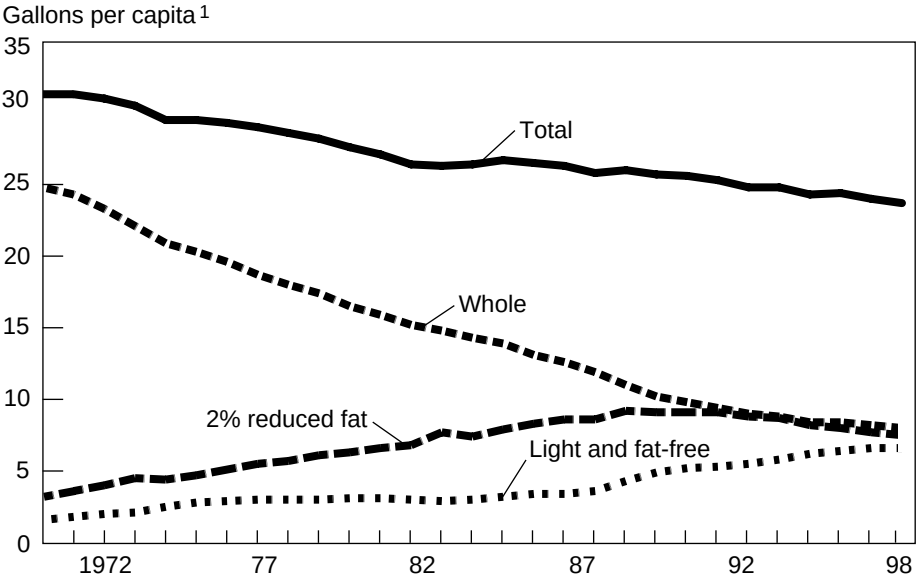


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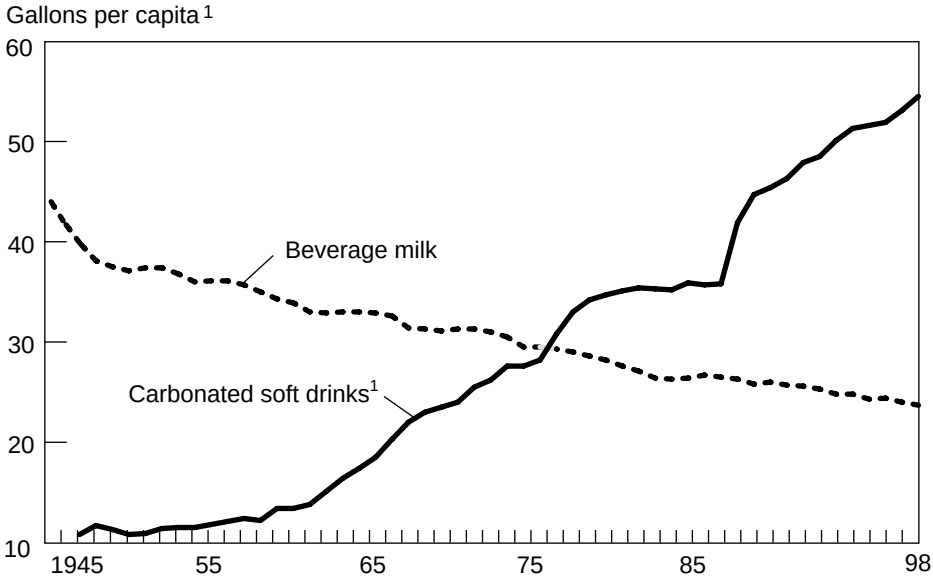
Figure 1-5.

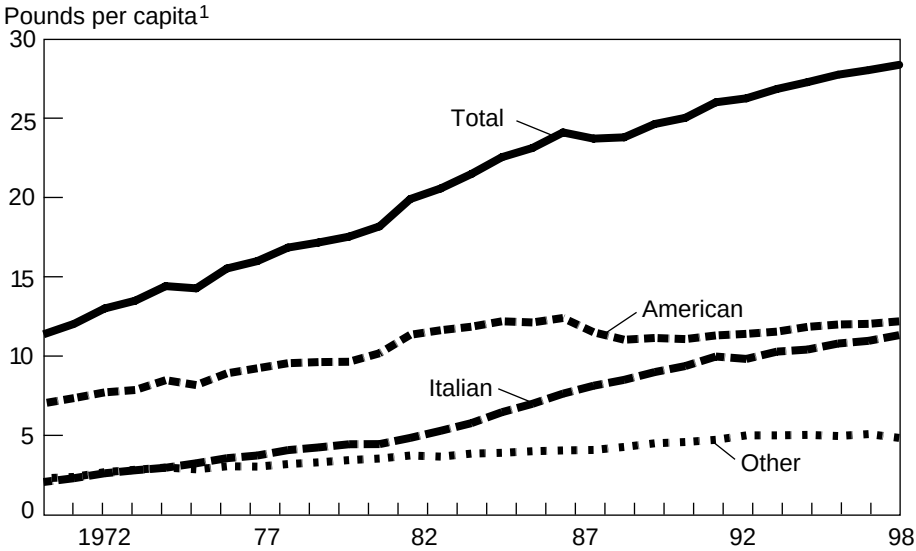
In 1945, Americans drank more than four times as much milk as carbonated soft drinks; in 1998, they downed nearly 2 1/3 times more soda than milk



[1]Excludes flavored milk and buttermilk.

Figure 1-6.

Per capita consumption of cheese in 1998 was 2 1/2 times higher than in 1970

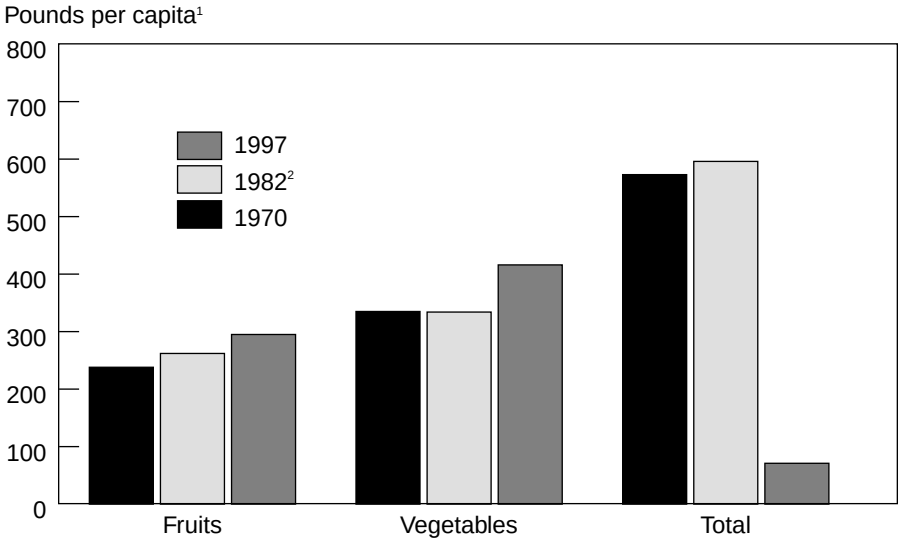


[1] Natural equivalent of cheese and cheese products. Excludes full-skim American and cottage type cheeses.

Source: USDA/Economic Research Service.

Figure 1-7.

Total per capita consumption of fruits and vegetables increased 24 percent between 1970 and 1997



[1]Fresh weight equivalent. [2]Publication of *Diet, Nutrition, and Cancer*, which emphasized the importance of fruits and vegetables in the daily diet.

Source: USDA/Economic Research Service.

Figure 1-8.

In 1998, per capita consumption of total added fats was 8 percent below 1993's record-high level but remained a fifth above the 1970 level

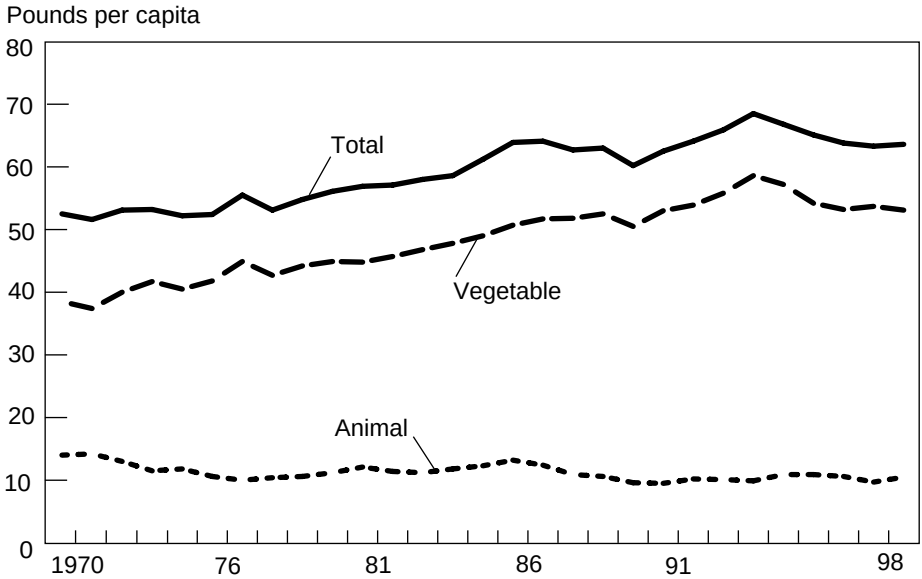
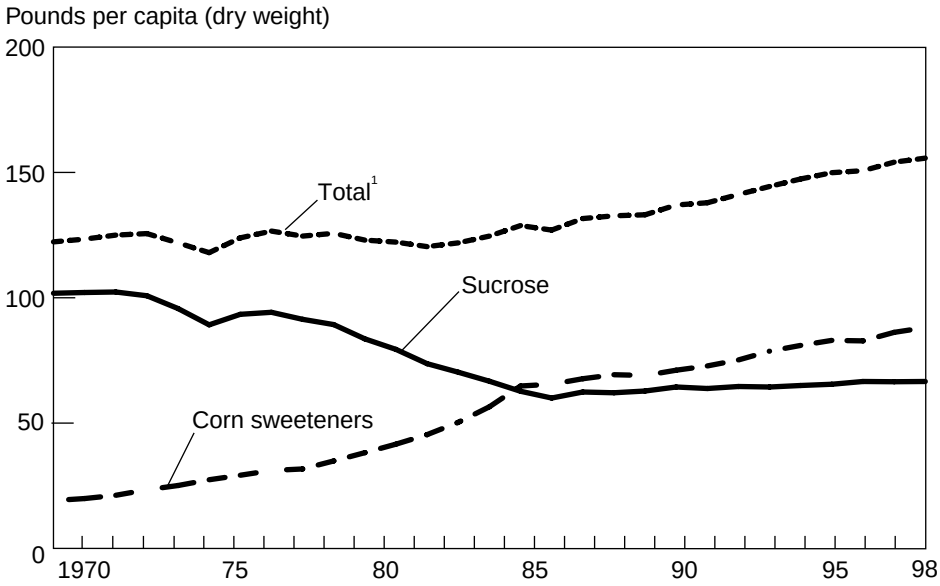


Figure 1-9.

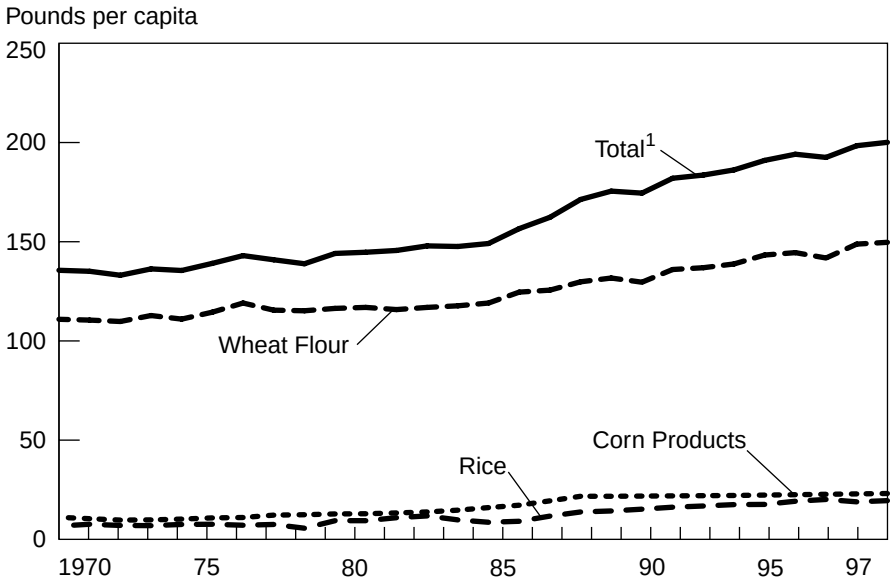
In 1998, Americans consumed an average two-fifths of a pound of sugar a day



[1]Excludes flavored milk and buttermilk.

Figure 1-10.

Consumption of flour and cereal products increased 48 percent between 1970 and 1997 to 200 pounds



[1] Includes oat, rye, and barley products.

Cost of Food Services and Distribution

The estimated bill for marketing domestic farm foods—which does not include imported foods—was $466 billion in 1998. This amount covered all charges for transporting, processing, and distributing foods that originated on U.S. farms. It represented 80 percent of the $585 billion consumers spent for these foods. The remaining 20 percent, or $119 billion, represents the gross return paid to farmers.

The cost of marketing farm foods has increased considerably over the years, mainly 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 the increase in services provided with the food.

In 1988, the cost of marketing farm foods amounted to $302 billion. In the decade after that, the cost of marketing rose about 54 percent. In 1998, the marketing bill rose 4.8 percent.

These rising costs have been the principal factor affecting the rise in consumer food expenditures. From 1988 to 1998, consumer expenditures for farm foods rose $186 billion. Roughly 88 percent 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, accounting for nearly half of all marketing costs. Labor used by assemblers, manufacturers, wholesalers, retailers, and public eating places cost $228 billion in 1998. This was 5.1 percent higher than in 1997 and 65 percent more than in 1988. The total number of food marketing workers in 1998 was about 13.8 million, about 17 percent more than a decade ago. About 73 percent of the growth in food industry employment occurred in public eating places.

Wage supplements comprise about 20 percent of total labor costs. However, the cost of wage supplements has accelerated at a slower pace in recent years for two reasons. First, the cost of medical care has risen at a slower pace in recent years. Second, union contracts often require workers to pay a greater portion of their medical care costs.

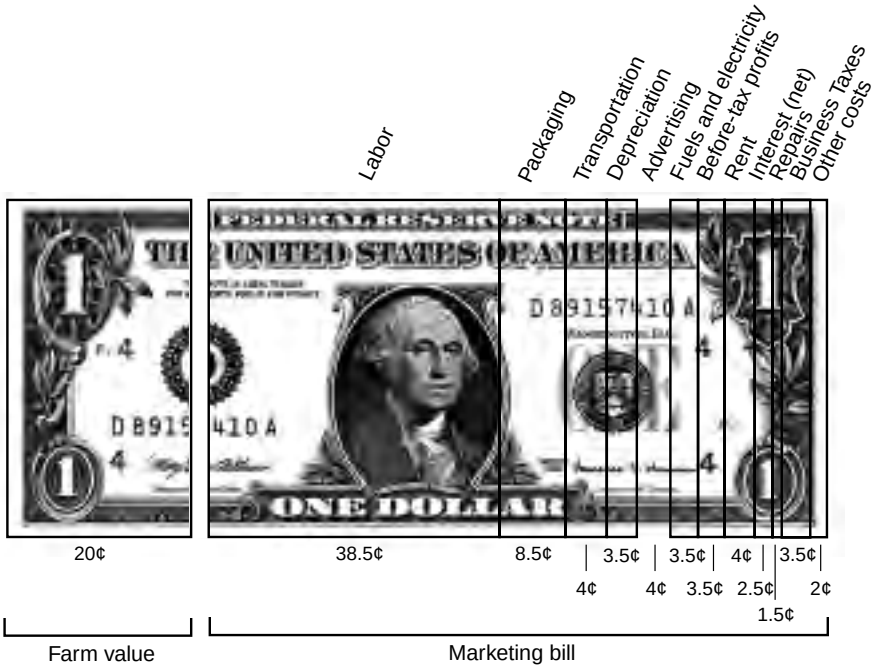
Labor productivity in food manufacturing industries has risen moderately over the years, thereby causing a long-term decline in employment. This trend largely reflects the adoption of various technologies which have reduced industry demand for labor. On the other hand, labor productivity has declined in food stores. This drop reflects increased demand for labor-intensive convenience foods prepared by supermarkets. The additional services which are required to prepare these foods have raised employee hours relative to output, thereby accounting for the lowered productivity.

A wide variety of other costs comprise the balance of the marketing bill. These costs include packaging, transportation, energy, advertising, business taxes, net interest, depreciation, rent, and repairs. Their relative proportions are illustrated in the accompanying dollar chart.

Packaging is the second largest component of the marketing bill. At $50 billion, packaging accounted for 8.5 percent of the food dollar. Paperboard boxes and containers are the largest packaging cost, and comprise approximately 40 percent of total packaging expenses. Metal cans are the second largest packaging expense, making up

Figure 1-11.

What a dollar spent for food paid for in 1998



about 20 percent of total food packaging expenses. The costs of plastic containers and wrapping materials account for another 20 percent of total food packaging expenses. Miscellaneous packaging materials such as glass containers and metal foil account for the remaining 20 percent of total packaging costs.

The energy bill for food marketing costs totaled $21 billion in 1998, and accounted for 3.5 percent of retail food expenditures. Natural gas and electricity prices exert the greatest impact on the energy costs of processing and retailing food. The prices of alternative energy sources, such as oil, have little effect. Public eating places and other food service facilities incur nearly 40 percent of the fuel and electricity costs of food marketing. Their energy expenses have risen because of large growth in the away-from-home food market. Energy costs of food retailers are the second largest, at about 26 percent of the energy bill, and consist mainly of electricity. Electricity is the primary source of energy in these food industries. The food processing sector is responsible for another 20 percent of the food energy bill, and uses a combination of gas and electricity. The wholesaling sector accounts for the remaining 14 percent of the food energy bill, and relies primarily on electricity.

Intercity truck and rail transportation for farm foods came to $24 billion and accounted for about 4 percent of retail food expenditures in 1998. Rail freight rates rose about 3 percent, while trucking rates grew roughly 3.5 percent. Labor costs account for 40 percent of trucking expenses, with fuel comprising another 20 percent.

Advertising expenses totaled $22 billion and comprised 4 percent of food expenditures in 1998. Food manufacturing accounts for about half of total food industry advertising expenditures, with food service contributing another 25 percent, and food retailing about 15 percent. A mix of print and broadcast media are used to promote food industry products. In recent years, food service and food retail firms have experienced the largest increases in advertising expenditures.

Depreciation, rent, and repairs together came to $53 billion and accounted for 9 percent of the 1998 consumer food dollar. The food service sector incurred about 40 percent of these costs, while food stores made up about a quarter of the total. Manufacturing and wholesaling establishments together accounted for the remaining 35 percent. Food service establishments incurred high property rental expenses, and thus had the highest total of any food sector.

Net interest accounts for only 2.5 percent of total consumer expenditures, but grew sharply over the last decade, rising to $13 billion in 1998. Most of the increase occurred in the food store sector, and reflected higher debt acquired due to merger and acquisition activity, particularly leveraged buyouts. Moreover, net interest grew as the result of loans booked during years of rising interest rates, such as 1995.

Food Prices and the Farm-to-Retail Price Spread

In the United States, total retail food prices (including meals served in restaurants) rose 36.0 percent over the last 10 years (1988-98). Prices of food eaten away from home increased 32.3 percent, while retail food store prices increased 38.2 percent.

Prices of goods and services, excluding food, in the Consumer Price Index climbed 38.1 percent over the same 10 years. Transportation was up 30.3 percent; housing, 35.4 percent; medical care, 74.7 percent; and apparel and upkeep, 15.3 percent.

Food prices include payments for both the raw farm product and marketing services. In 1998 the farm value, or payment for the raw product, averaged 2.2 percent of the retail cost of a market basket of U.S. farm foods sold in food stores. The other 7.8 percent, the farm-retail price spread, consisted of all processing, transportation, wholesaling, and retailing charges incurred after farm products leave the farm.

Farm-retail spreads have increased every year for the past 30 years, largely reflecting rising costs of labor, packaging, and other processing and marketing inputs. In 1998, farm-to-retail spreads rose an average of 3.6 percent and farmers received 2.7 percent less for the food they produced. The farm value as a percentage of retail prices was about 1 percent lower in 1998 than in 1997. Meanwhile, retail food prices rose 2.1 percent. Widening farm-retail spreads continued to push up food costs in 1998.

The percentage of the retail price accounted for by the farm value varies widely among foods. Generally, it is larger for animal products than for crop-based foods, and smaller for foods that require considerable processing and packaging. The percentage generally decreases as the degree of processing increases. For example, the farm value of meat was 30 percent in 1998, while cereal and bakery products

had a farm value averaging only 6 percent. The farm inputs needed to feed, house, and maintain the health of livestock are greater than the inputs required to grow crops. The additional manufacturing processes required for cereal and bakery products also result in a lower farm value than for meats. Most other foods also entail fewer inputs at the farm level. Other factors that influence the farm value percentage include transportation costs, product perishability, and retailing costs. Higher levels of these marketing factors tend to lower the farm value percentage.

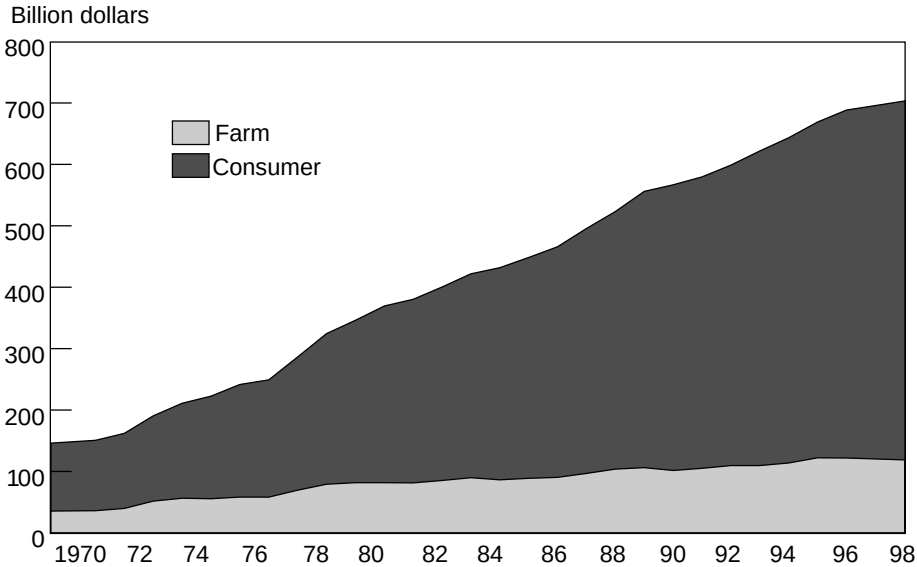
Table 1-1.

Farm value as a percentage of retail price for domestically produced foods, 1988 and 1998

Items	*1988*	*1998*
Livestock products:		
Meats	45	30
Dairy	40	36
Poultry	49	43
Eggs	53	42
Crop Products:		
Cereal and bakery	9	6
Fresh fruits	25	17
Fresh vegetables	28	20
Processed fruits and vegetables	28	18
Fats and oils	24	22

Figure 1-12.

Distribution of consumer expenditures



2. Structure of U.S. Agriculture

Farming Regions

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

The Northeastern States and the Lake States are the Nation's principal milk-producing areas. Climate and soil in these States are suited for raising grains and forage for cattle and for providing pastureland for grazing. Broiler farming is important in Maine, Delaware, and Maryland. Fruit and vegetables are also important to the region.

The Appalachian region is the major tobacco-producing region in the Nation. Peanuts, cattle, and dairy production are also important there.

In the Southeast region, beef and broilers are important livestock products. Fruits, vegetables, and peanuts are grown in this region. Big citrus groves and winter vegetable production areas in Florida are major suppliers of agricultural goods. Cotton production is making a comeback.

In the Delta States, 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 has rich soil and good climate 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.

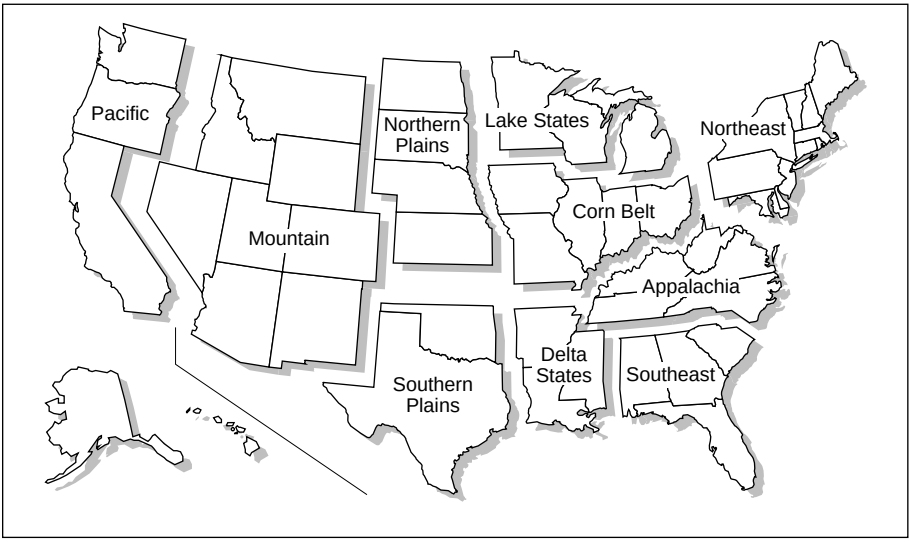
Agriculture in the Northern and Southern Plains, which extend north and south from Canada to Mexico, is restricted by rainfall in the western portion and by cold winters and short growing seasons in the northern part. About three-fifths of the Nation's Winter and Spring wheat is produced in this region. Other small grains, grain sorghum, hay, forage crops, and pastures form the basis for raising cattle. Cotton is produced in the southern part.

The Mountain States provide a still different terrain. Vast areas of this region are suited for 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 Washington and Oregon specialize in raising wheat, fruit, and potatoes; vegetables, fruit, and cotton are important in California. Cattle are raised throughout the region. In Hawaii, sugarcane and pineapples are the major crops. Greenhouse/nursery and dairy products are Alaska's top-ranking commodities.

Figure 2-1.

U.S. farm production regions



Farms and Land in Farms

The United States had 2.19 million farms in 1998, up fractionally from 1997. A farm is defined as any establishment from which $1,000 or more of agricultural products were sold or would normally be sold during the year. The number of farms declined less than 1 percent, overall, during the period 1988 through 1998.

Land in farms continues to decline slowly; the total of 954 million acres in 1998 is down 0.2 percent from a year earlier and down 4.1 percent from 1988. Land in farms has declined every year since reaching its peak at 1.206 billion acres in 1954. The average size of farms decreased from 452 acres in 1988 to 435 acres in 1998, while the number of farms declined at a smaller rate over the same period.

Table 2-1.

Number of farms, land in farms, average farm size: United States, June 1, 1988-98[1, 2]

Year	*Number of Farms*	*Land in Farms*	*Average Farm Size*
	In 1,000	*In 1,000 acres*	*In acres*
1988	2,201	994,423	452
1989	2,175	990,723	456
1990	2,146	986,850	460
1991	2,117	981,736	464
1992	2,108	978,503	464
1993	2,201	968,845	440
1994	2,198	965,935	440
1995	2,196	962,515	438
1996	2,191	958,675	438
1997	2,191	968,010	436
1998	2,192	953,765	435

[1]A farm is any establishment from which $1,000 or more of agricultural products were sold or would normally be sold during the year.
[2]1988-92 estimates are for a June 1 reference date. 1993-98 estimates are for the entire calendar year.
Source: U.S. Department of Agriculture, National Agricultural Statistics Service, Farms and Land in Farms

Farms by Sales Class

Farms are commonly classified in size groups based on the total value of their gross farm sales. Data from USDA, National Agricultural Statistics Service's annual Farms and Land in Farms report show that the greatest number of farms is in the lower sales classes, with over 64.3 percent reporting gross farm sales of less than $20,000 in 1998. According to the survey, these small farms accounted for only 20 percent of the acreage operated. A relatively small number of very large farms produce the largest share of farm sales. Only 3.1 percent of the farms in 1998 were large operations with sales of $500,000 or more, but they operated 17.6 percent of the land. Average farm size increases consistently with sales class, ranging from 68 acres per farm in the less than $2,500 category to 2,471 acres for farms with receipts of $500,000 or more.

Table 2-2.

Number of farms and land in farms: by State and United States, June 1, 1993-98[1]

State	Farms			Land in farms		
	1993	1994	1995	1993	1994	1995
	Number of farms			1,000 Acres		
AL	46,000	46,000	47,000	10,000	10,200	10,200
AK	530	520	520	940	930	920
AZ	7,400	7,400	7,400	35,500	35,400	35,400
AR	45,000	44,000	43,000	15,300	15,100	15,000
CA	79,000	79,000	80,000	30,000	29,900	30,000
CO	25,500	25,300	25,000	32,800	32,700	32,700
CT	3,800	3,800	3,800	400	390	380
DE	2,500	2,500	2,500	570	570	570
FL	39,000	39,000	39,000	10,300	10,300	10,300
GA	46,000	45,000	45,000	12,100	12,100	12,000
HI	4,800	4,800	4,800	1,590	1,590	1,590
ID	20,500	20,500	21,500	13,500	13,500	13,500
IL	79,000	77,000	77,000	28,100	28,100	28,100
IN	63,000	63,000	62,000	16,000	16,000	15,900
IA	102,000	101,000	100,000	33,300	33,200	33,200
KS	65,000	65,000	66,000	47,800	47,800	47,800
KY	91,000	89,000	89,000	14,100	14,100	14,000
LA	29,000	28,000	27,000	8,600	8,400	8,500
ME	7,300	7,600	7,600	1,400	1,360	1,350
MD	15,000	14,500	14,300	2,200	2,200	2,200
MA	6,200	6,000	6,000	610	600	570
MI	52,000	52,000	54,000	10,700	10,700	10,700
MN	87,000	85,000	87,000	29,700	29,700	29,800
MS	39,000	39,000	42,000	12,800	12,800	13,000
MO	106,000	105,000	105,000	30,200	30,100	30,000
MT	23,800	22,500	22,000	59,800	59,700	59,700
NE	55,000	55,000	56,000	47,100	47,100	47,000
NV	2,400	2,400	2,500	8,900	8,800	8,800
NH	2,500	2,400	2,300	440	440	440
NJ	8,900	8,900	9,000	870	860	850
NM	13,500	13,500	13,500	44,200	44,200	44,000
NY	37,500	36,000	36,000	8,100	7,900	7,700
NC	59,000	58,000	58,000	9,400	9,300	9,200
ND	32,500	32,000	32,000	40,400	40,400	40,300
OH	76,000	75,000	74,000	15,200	15,200	15,200
OK	70,500	70,000	71,000	34,000	34,000	34,000
OR	37,500	38,000	38,500	17,500	17,500	17,500
PA	51,000	51,000	50,000	7,900	7,800	7,700
RI	700	700	700	63	63	63
SC	24,000	23,000	22,000	5,150	5,100	5,050
SD	34,500	34,000	33,000	44,200	44,200	44,000
TN	84,000	83,000	81,000	12,100	12,000	12,000
TX	200,000	200,000	202,000	30,000	129,000	129,000
UT	13,000	13,000	13,400	11,200	11,100	11,100
VT	6,400	6,200	6,000	1,430	1,400	1,370
VA	45,000	46,000	47,000	8,600	8,600	8,600
WA	36,000	36,000	36,000	16,000	15,800	15,800
WV	20,000	20,000	20,000	3,700	3,700	3,700
WI	79,000	79,000	80,000	17,100	16,900	16,900
WY	9,200	9,200	9,200	34,600	34,600	34,600
US	2,083,430	2,064,720	2,071,520	976,463	973,403	972,253

Table 2-2 continued.

Number of farms and land in farms: by State and United States, June 1, 1993-98[1]

State	Farms 1996	Farms 1997	Farms 1998	Land in farms 1996	Land in farms 1997	Land in farms 1998
	Number of farms			1,000 Acres		
AL	49,000	49,000	49,000	9,700	9,600	9,500
AK	550	560	560	920	910	910
AZ	7,900	7,900	7,900	28,300	28,300	28,300
AR	49,500	49,000	49,500	14,900	14,800	14,750
CA	86,000	87,000	89,000	29,000	28,700	28,500
CO	29,500	29,500	29,500	32,500	32,500	32,200
CT	4,100	4,100	4,100	380	380	380
DE	2,800	2,800	2,700	590	585	580
FL	45,000	45,000	45,000	10,700	10,600	10,600
GA	49,000	49,000	50,000	11,400	11,300	11,300
HI	5,400	5,500	5,500	1,440	1,440	1,440
ID	24,000	24,500	24,500	12,100	12,000	12,000
IL	79,000	79,000	79,000	27,900	27,800	27,800
IN	66,000	66,000	66,000	15,600	15,600	15,600
IA	99,000	98,000	97,000	33,000	33,000	33,000
KS	65,000	65,000	65,000	47,500	47,500	47,500
KY	92,000	91,000	90,000	14,000	13,900	13,900
LA	30,000	30,000	30,000	8,300	8,200	8,200
ME	7,200	7,000	6,900	1,310	1,280	1,280
MD	13,700	13,000	12,500	2,200	2,200	2,100
MA	6,000	6,000	6,000	570	570	570
MI	54,000	53,000	52,000	10,600	10,400	10,400
MN	82,000	81,000	80,000	29,200	29,100	28,900
MS	42,000	42,000	42,000	11,900	11,700	11,600
MO	110,000	110,000	110,000	30,100	30,100	30,100
MT	26,500	27,000	27,500	58,500	57,800	57,500
NE	56,000	55,000	55,000	46,400	46,400	46,400
NV	3,000	3,000	3,000	6,900	6,900	6,900
NH	2,900	3,000	3,100	420	420	420
NJ	9,500	9,600	9,600	840	830	830
NM	15,500	15,500	16,000	45,100	45,300	45,300
NY	38,000	38,000	38,000	7,800	7,800	7,800
NC	59,000	59,000	58,000	9,500	9,500	9,400
ND	32,000	31,500	31,000	39,900	39,700	39,500
OH	78,000	79,000	80,000	14,900	14,900	14,900
OK	82,000	83,000	83,000	34,000	34,000	34,000
OR	38,500	39,000	39,500	17,500	17,500	17,200
PA	59,000	60,000	60,000	7,600	7,700	7,700
RI	750	750	750	65	65	65
SC	25,000	25,000	25,000	5,000	5,000	4,900
SD	32,500	32,500	32,500	44,000	44,000	44,000
TN	91,000	91,000	91,000	12,000	12,000	11,900
TX	224,000	225,000	226,000	132,000	131,500	131,500
UT	15,000	15,000	15,000	11,400	11,600	11,600
VT	6,500	6,600	6,700	1,340	1,330	1,340
VA	49,000	49,000	49,000	8,800	8,800	8,800
WA	39,000	39,000	40,000	15,700	15,700	15,700
WV	21,000	21,000	21,000	3,700	3,700	3,700
WI	79,000	79,000	78,000	16,600	16,500	16,400
WY	9,200	9,200	9,200	34,600	34,600	34,600
US	2,190,500	2,190,510	2,191,510	958,675	956,010	953,765

[1]A farm is any establishment from which $1,000 or more of agricultural products were sold or normally would be sold during the year. Source: USDA/ National Agricultural Statistics Service, Farms and Land in Farms.

Table 2-3.

Percent of farms and land in farms: by economic sales class, United States, 1997-98[1]

Economic class (gross value of sales)	Percent of total				Average size of farms (acres)	
	Farms		Land			
	1996	1997	1996	1997	1996	1997
$1,000 - $2,499	27.4	27.6	4.4	4.3	70	68
$2,500 - $4,999	14.6	14.7	4.4	4.4	132	130
$5,000 - $9,999	12.4	12.1	5.4	5.5	190	198
$10,000 - $19,999	9.9	9.9	5.8	5.8	256	255
$20,000 - $39,999	9.0	8.9	7.4	7.3	359	357
$40,000 - $99,999	10.6	10.5	17.0	16.8	700	696
$100,000 - $249,999	9	8.9	24.0	23.5	1,164	1,149
$250,000 - $499,999	4.1	4.3	14.2	14.8	1,512	1,498
$500,000 +	3.0	3.1	17.4	17.6	2,531	2,471
Total	100.0	100.0	100.0	100.0	436	435

[1]A farm is any establishment from which $1,000 or more of agricultural products were sold or normally would be sold during the year. Source: U.S. Department of Agriculture, National Agricultural Statistics Service

Legal Structure of U.S. Farms (Individual, Partnership, Corporation)

Type of organization refers to the farm's form of business organization. Farms may broadly be classified as individual operations (proprietorships), partnerships, or corporations (family and nonfamily). Agricultural Resource Management Study data indicate that individual operations are the most common type of farm organization. Nine out of ten farms in the 1997 survey were classified as individual operations. Partnerships and corporations make up a very small share of farms. About 85 percent of farm corporations are family corporations, with more than 50 percent of the stock held by people related by blood or marriage. Individual operations account for the largest share of farmland (75 percent) and gross farm sales (60 percent). Corporate farms have the highest average farm sales. The average value of gross farm sales by corporate farms in 1997 was $724,867, while partnerships averaged $243,464. Gross sales for individual operations averaged $53,518, less than one-quarter of the corporate level. Average acreage was also higher for corporate farms (2,024 acres) and for partnerships (1,006 acres) than for individual operations (373 acres).

Land Tenure

Land tenure describes the farm operator's ownership interest in the land farmed. The major land tenure categories are (1) full owners, who own all the land they operate; (2) part owners, who own some and rent the remainder of their land; and (3) tenants, who rent all of their land or work on shares for others. The majority of farms in the 1997 Agricultural Resource Management Study (55 percent) reported full ownership of the land they operated, while 35 percent owned part and rented part of the farmland they operated. Only 9 percent of operations reported that they rented all of their land.

Part owners generally operate the largest farms, averaging 800 acres in 1997, followed by tenants with 545 acres and full owners with 219 acres per farm. Part owners account for the largest share of acreage operated (62 percent of the total in 1997).

Gross farm sales are also concentrated on part-owner operations (54 percent of gross farm sales in 1997). The average value of gross farm sales for part owners in 1997 was $125,867, about $8,988 less than the average for tenants at $134,855. Gross farm sales for full-owner operations were much smaller, averaging $45,632.

Major Uses of U.S. Cropland

The major uses of U.S. cropland include cropland harvested, summer fallow, land idled in Federal programs, and crop failure. Cropland harvested peaked in 1981 at 351 million acres. Harvested cropland declined to 287 million acres in 1988 and is estimated at 314 million acres in 1998. Summer fallow acreage ranges between 20 million and 34 million acres per year. Cropland idled in Federal commodity and conservation programs has ranged from none in 1980 and 1981 to 78 million acres in 1983 and 1988. Crop failure generally varies within a range of 5-11 million acres per year. The noticeable differences are often the result of weather conditions such as the drought in 1988, or the flood and wet weather at planting time in 1993.

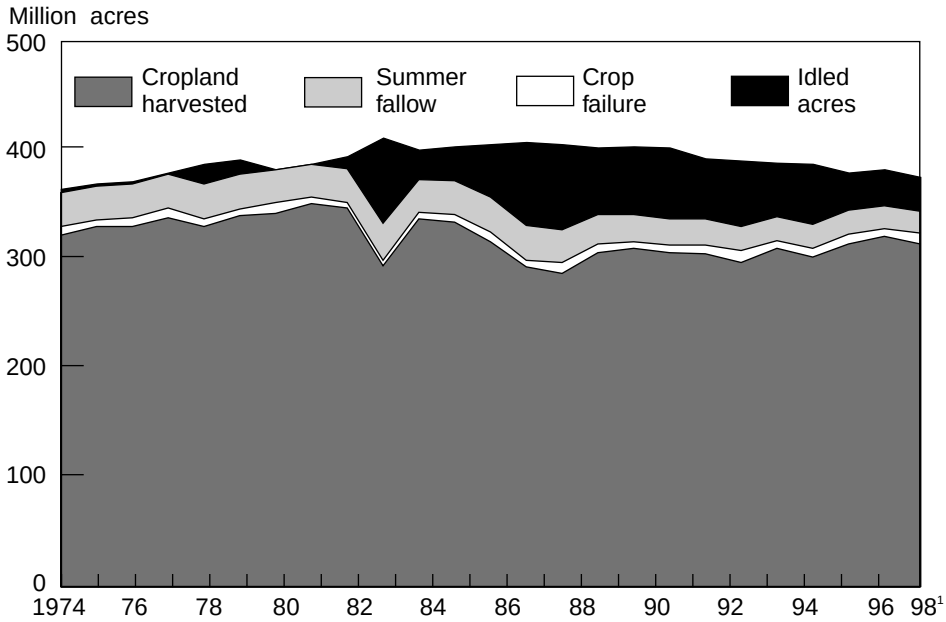
In 1983, the sharp decline in cropland harvested was the result of "PIK" (payment-in-kind), a USDA land retirement program that paid for the land retirement with surplus commodities. The idle acreage in 1983 included nearly 49 million acres in the PIK program and more than 29 million acres in the Acreage Conservation Reserve and Paid Land Diversion programs.

Acreage Harvested of Major Crops

The harvested acreage of corn in recent years has varied from 51.5 million acres in 1983 to 75.2 million acres in 1985, largely as the result of Federal acreage reduction programs. The PIK program idled nearly 22 million acres of corn acreage in 1983. Wheat acreage has ranged between a high of 80.6 million acres in 1981 to a low of 53.2 million acres in 1988. The PIK program removed about 18 million acres of wheat base from production in 1983. Barley and oat acreage harvested have been declining since the early 1970's. Acreage has tended to shift out barley and oats to the more profitable crops. Soybean acreage harvested has fluctuated as the relative prices of soybeans and corn changed and as prices for soybeans in the world market were more or less favorable. Soybean acreage was at a 24-year high in 1998, at 70.8 acres.

Figure 2-2.

Major uses of U.S. cropland, 1974-98



[1]preliminary.

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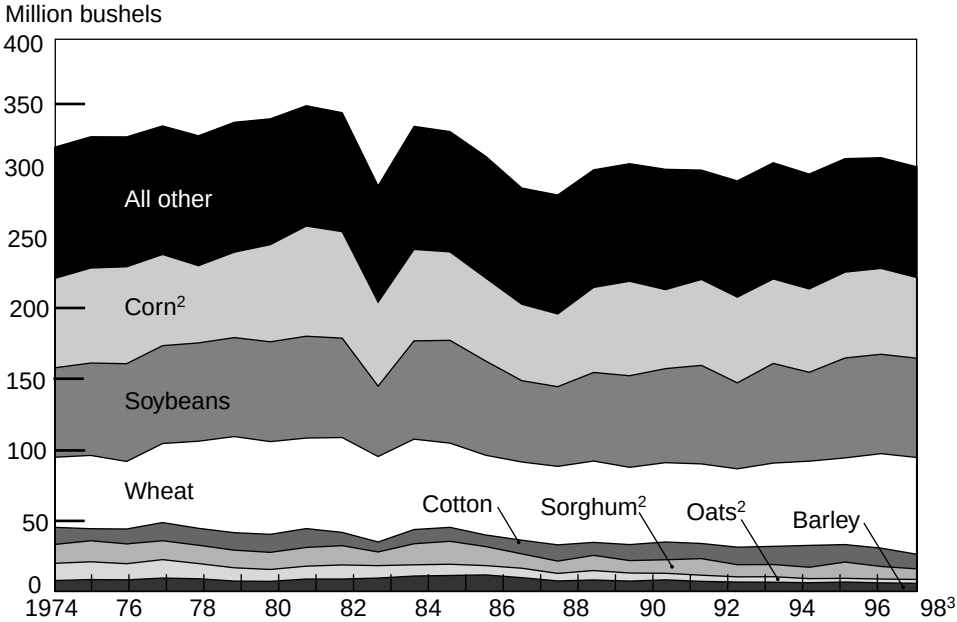
Figure 2-3.

Acreage harvested of specified crops, 1974-98[1]



[1]Includes the 48 conterminous States.
[2]Corn and sorghum for grain.
[3]Preliminary.

3. The U.S. Farm Sector

Farm Labor

Labor use on U.S. farms has changed dramatically over the past several decades. Average annual farm employment dropped from 9.9 million in 1950 to 2.8 million in 1998. This decrease resulted largely from the trend toward fewer and larger farms, increased farm mechanization and other technological innovations, and higher off-farm wages. However, farm employment appears to have stabilized in recent years as increases in mechanization and labor-saving technology have leveled off and the downward trend in farm numbers has slowed.

Family workers, including farm operators and unpaid workers, accounted for 69 percent of farm labor in 1998, while hired farm workers accounted for 31 percent. Service workers, including crew leaders and custom crews, accounted for 9 percent of all workers on farms in 1998.

The average wage rate for hired farm workers in the United States in 1998 was $7.47 per hour. Wages varied by type of worker: livestock workers averaged $7.03 per hour, and field workers averaged $6.97 per hour.

A significant portion of total farm production expenses is spent on labor. The 1997 Census of Agriculture reported the expenditures for hired and contract labor on U.S. farms were $17.8 billion in 1997, or almost 12 percent of total farm production expenses. About 34 percent of all farms had hired labor expenses and 12 percent had contract labor expenses.

The importance of labor varied significantly by farm type and size of farm. The proportion of total farm production expenses attributed to hired and contract labor expenses was greatest on horticultural specialty farms (44 percent), fruit and tree nut farms (40 percent), and vegetable and melon farms (32 percent). These types of farms are least mechanized, and many of the commodities they produce are still harvested by hand. At the other extreme, labor expenses comprised less than 5 percent of all production expenses on beef cattle, hogs, sheep, and poultry farms.

Larger farms are more likely to have labor needs in excess of that provided by the family farm. Farms of 260 or more acres, which accounted for only 31 percent of all farms, had 70 percent of all labor expenses in 1997. In terms of sales class, the 26 percent of all farms with $50,000 or more in value of products sold accounted for 96 percent of all labor expenses.

Agricultural Credit

Farm business debt at the end of 1997 was $165.4 billion, up $9.3 billion from 1996. Farm real estate debt rose $3.7 billion (over 4 percent) from 1996 to $85.4 billion at the end of 1997, while farm business nonreal estate debt increased $5.6 billion (over 7 percent) to $80.1 billion at the end of 1997. The increase in farm debt in 1997 was higher than the recent trend of modest growth in outstanding loan balances.

While volatile commodity prices have generated some concern about short-term profitability in some farm enterprises, farmers and lenders maintain confidence in the long-run viability of agriculture. The availability and use of credit plays a significant role in the sustained profitability of farm enterprises. In this regard, a symbiotic relationship exists between agricultural producers and their lenders; the health of one depends on the condition of the other.

Loans made to agricultural producers are classified as real estate and non-real-estate loans in the farm sector accounts. Real estate loans generally have terms of 10 to 40 years and are ordinarily used to purchase farmland or to make major capital improvements to farm property. Non-real-estate loans are typically made for loan terms of less than 10 years, with the term depending on the purpose of the loan. Seasonal operating loans are made for less than 1 year, while loans to purchase machinery and equipment or livestock may run for 7 years or more.

Commercial banks held over 40 percent of all farm business debt at the end of 1997, providing $25.2 billion in real estate loans (almost 30 percent of total) and $41.7 billion in non-real-estate debt (52 percent). The Farm Credit System (FCS) held $27.1 billion in farm business real estate loans and $15.2 billion in non-real-estate loans. In total, the Farm Credit System held about 25 percent of farm business loans. Favorable interest rate spreads improved FCS earnings during 1990-97. Improved borrower financial conditions have translated into improved Farm Credit System performance.

Life insurance companies maintained their presence in the agricultural credit market, as their total farm business debt rose slightly to $9.7 billion, giving them an 11-percent share of the farm business mortgage market. USDA's Farm Service Agency (formerly Farmers Home Administration) direct loans to farm businesses dropped by $600 million in 1997. The "Individuals and others" classification is composed primarily of sellers financing the sale of farmland, input suppliers, farm machinery finance corporations, and some minor lending agencies. These accounted for $19 billion in real estate loans and $18.8 billion in non-real-estate loans at the end of 1997.

Table 3-1.

Farm business debt, selected years

	Farm debt outstanding, December 31												
	1950	*1960*	*1970*	*1980*	*1985*	*1990*	*1991*	*1992*	*1993*	*1994*	*1995*	*1996*
Real estate debt:						*$ Billion*							
Farm Credit System	0.8	2.2	6.4	33.2	42.2	26.0	25.3	25.4	24.9	24.6	24.9	25.7	27.1
Life insurance companies	1.1	2.7	5.1	12.0	11.3	9.7	9.5	8.8	9.0	9.0	9.1	9.5	9.7
Banks	0.8	1.4	3.3	7.8	10.7	16.3	17.4	18.8	19.6	21.1	22.3	23.3	25.2
Farm Service Agency	0.2	0.6	2.2	7.4	9.8	7.6	7.0	6.4	5.8	5.5	5.1	4.7	4.4
Individuals and others	2.1	4.5	10.5	27.8	25.8	15.2	15.6	16.1	16.7	17.5	18.0	18.5	19.0
Total	5.2	11.3	27.5	89.7	100.1	74.79	74.9	75.4	76.0	77.7	79.3	81.7	85.4
Non-real-estate debt:													
Banks	2.4	4.7	10.5	30.0	33.7	31.3	32.9	32.9	34.9	36.7	37.7	38.3	41.7
Farm Credit System	0.5	1.5	5.3	19.8	14.0	9.8	10.2	10.3	10.5	11.2	12.5	14.0	15.2
Farm Service Agency	0.3	0.4	0.7	10.0	14.7	9.4	8.2	7.1	6.2	6.0	5.1	4.6	4.3
Individuals and others	2.5	4.5	4.8	17.4	15.1	12.7	13.0	13.2	14.2	15.2	16.2	17.4	18.8
Total	5.7	11.1	21.3	77.1	77.5	63.2	64.3	63.6	65.9	69.1	71.5	74.4	80.1
Total, all	10.9	22.4	48.8	166.8	177.6	138.0	139.2	139.1	141.9	146.8	150.8	156.1	165.4

Source: USDA, Economic Research Service, Resource Economics Division.

The Balance Sheet

Farm business asset values are estimated to have totaled $1,088.8 billion on December 31, 1997, an increase of 5 percent over the preceding year. Farm business debt rose 6 percent during 1997, totaling $165.4 billion at year's end. As a result, farm business equity is estimated to have risen 5.2 percent.

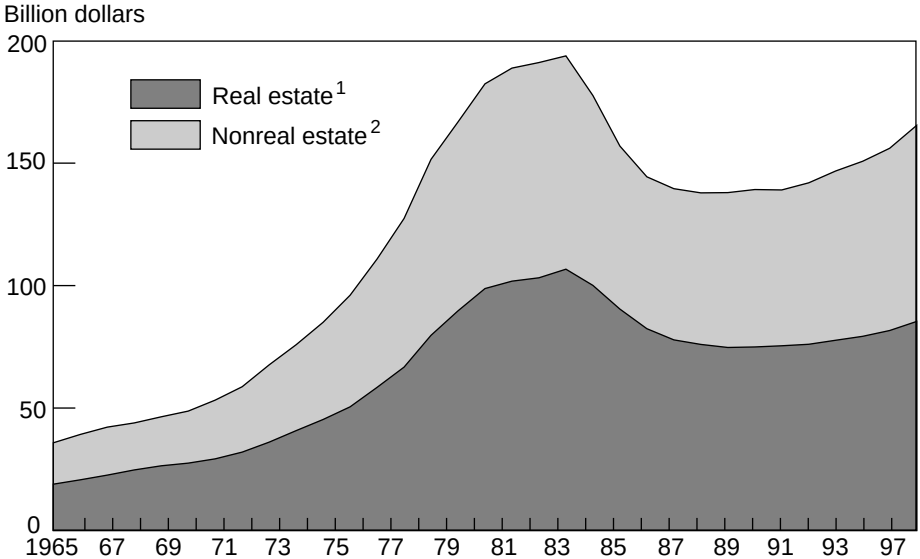
The debt-to-asset ratio for 1997 (expressed as a percentage) increased from 15.1 to 15.2. This ratio is substantially below the peak of 24 percent reached in 1985.

Real estate assets accounted for 78 percent of the value of farm business assets at the end of 1997. Real estate assets are expected to have increased 6 percent during the year.

Non-real-estate assets are estimated to have increased 2 percent during 1997. The value of machinery and motor vehicles and for crops stored decreased from 1996 to 1997, whereas, the value of purchased inputs, financial assets, and livestock and poultry increased during this period.

Figure 3-1.

Farm business debt

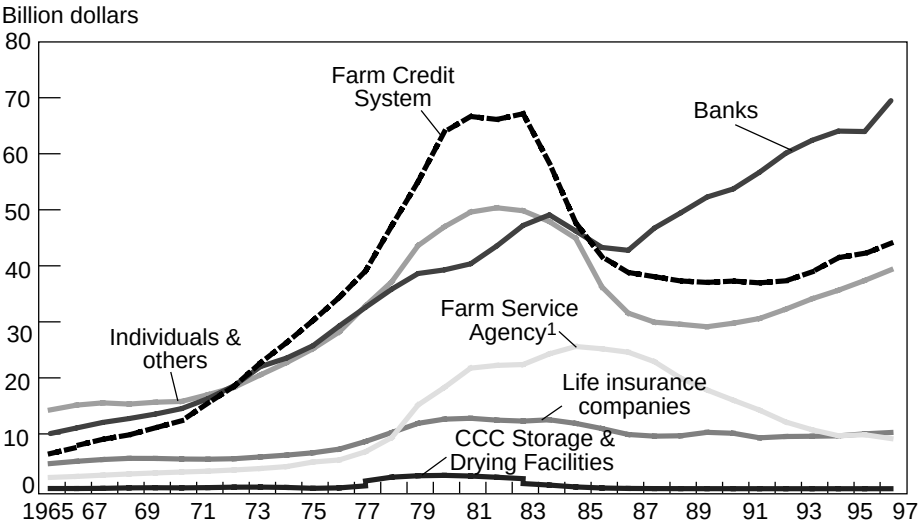


[1] Debt secured by farm real estate. [2] Debt for operating purposes.

Source: USDA, Economic Research Service, Resource Economics Division.

Figure 3-2.

Farm business debt by lender



[1] Includes the former Farmers Home Administration's loans.
Individuals and others include Commodity Credit Corporation real estate loans.

Source: USDA, Economic Research Service, Resource Economics Division.

Farm business real estate debt increased 4.5 percent in 1997, standing at $85.4 billion at the end of the year. Non-real-estate debt rose 7.6 percent to $80.0 billion. On December 31, 1997, commercial banks held 40 percent of farm business debt, and the Farm Credit System held 26 percent.

Table 3-2.

Farm business assets, debt, and equity[1]

Item	*1960*	*1970*	*1980*	*1990*	*1997*
		Billion dollars			
Assets	171.0	273.0	965.9	841.5	1,088.8
Real estate	123.3	202.4	782.8	620.0	849.2
Non-real-estate 2/	47.7	70.6	183.0	221.5	239.6
Debt	22.4	48.8	166.8	138.0	165.4
Real estate 3/	11.3	27.5	89.7	74.7	85.4
Non-real-estate 4/	11.1	21.2	77.1	63.2	80.1
Equity (assets minus debt)	148.6	224.3	799.0	703.5	923.4

[1] As of December 31. 2/ Crop inventory value is value of non-Commodity Credit Corportation (CCC) crops held on farms plus value above loan rate for crops held under CCC. 3/ Includes CCC storage and drying facilities loans. 4/ Excludes value of CCC crop loans.
Source: USDA, Economic Research Service, Resource Economics Division.

Net Value-Added, Net Farm Income, and Net Cash Income

Net value-added and net farm income both declined by $3.5 billion in 1997, but each measure remained at a level surpassed only by the record values attained in 1996. Both these measures of farm income had risen substantially from 1995 to 1996. As a consequence, even though net value-added fell 3.7 percent in 1997, it was still $17.9 billion greater than for 1995. **Net value-added** represents the total value of the farm sector's output of goods and services, less payments to other (non-farm) sectors of the economy, and is production agriculture's addition to national output.

The value of the sector's production (final output) increased by $2.3 billion in 1997. This increase, however, was exceeded by the $5.7 billion expansion in out-of-pocket costs (intermediate consumption outlays). The result was $3.5 billion less in net value-added to be distributed among the providers of resources to the farm sector in 1997. Hired workers and lenders received 3.9 percent and 3.5 percent more for their contributions to 1997 farm production than in 1996. By contrast, the earnings of non-operator landlords were down 7.4 percent. The decline in earnings to landlords reflected lower returns to holders of share-rent contracts, which, in turn, can be traced directly to the $3.1 billion decline in the value of crop production. Most share-rent arrangements involve crops, and while the harvest for many major crops remained near or even exceeded the record levels of 1996, prices received in selling commodities were significantly lower than in 1996.

Net farm income, which fell $3.5 billion from 1996 to 1997, is that portion of net value-added earned by farm operators (defined as those individuals and entities who share in the risks of production). Typically, it is the farm operators who benefit most from the increases and absorb most of the declines arising from short-term, unanticipated weather, and market conditions. In fact, an amount equal to the total 1997 drop in net value-added accrued to farm operators, as the increase in factor payments to hired labor and lenders offset the lower payments to landlords. Declining prices accounted for much of the drop in net value-added in 1997 and is reflected in net farm income.

Net cash income rose by $4.3 billion, a 7.7-percent increase from 1996 to 1997. Cash earnings realized within the year from the sales of production, and the conversion of assets, both inventories (in years in which they are reduced) and capital consumption, into cash are the receipts included in net cash income. Unlike net farm income, net cash income does not include the value of home consumption, changes in inventories, capital replacement, and implicit rent and expenses related to the farm operator's dwelling—none of which reflect cash transactions during the current year.

The value of the agricultural sector production (commodities and services) rose a mere $2 billion from 1996 to 1997, but the level in 1996 had exceeded the previous record (1994) by a whopping $20 billion. Increases of $5 billion in the value of cattle production and $3.6 billion in the value of soybean production more than offset the declines in value of other commodities where lower prices decreased returns. Yet, the higher value of output only partially offset the $5.7 billion increase in intermediate consumption outlays. The outcome was a $3.8 billion fall in net value-added.

The total value of final 1997 crop output was down $3.4 billion, reflecting significant price declines for many major crops. In 1996, crop prices had been high in the first half but began a decline in the second half that continued on through 1997. Soybeans were an exception as prices ascended to an unusually rarified level of $8 per bushel or more in the first half of 1997. Soybean prices began tailing off in the second half, but still finished the year in a range favorable to producers. With large crop harvests in 2 consecutive years, farmers sold during the year approximately what they harvested, incrementing inventories by a modest $323 million. Inclusion of the inventory change enables a full accounting of a current year's production in the tabulation of the calendar year's farm sector output.

The total value of livestock production in 1997 was $4 billion higher than the previous year, the second consecutive year with significant increase. The value of cattle produced jumped $5 billion, and hog producers added another $498 million to the production of meat animals. The value of dairy products declined $1.8 billion. Market prices available to farmers for hogs and broilers declined sharply in the latter half of 1997, beef cattle prices were steady throughout the year after staging a comeback from lows reached in first half of 1996, and dairy prices bottomed out and turned up in the summer of 1997. The $5 billion rise in cattle production resulted from a jump in production in response to the improvement in market prices. Producers reversed the herd liquidation which they had been employing to minimize the consequences of being caught in an ongoing cost-price squeeze without prospects of an immediate turnaround. The rapid structural change occurring in livestock production with regional shifts in production and consolidation into large operations

Table 3-3.

Value added to the U.S. economy by the agricultural sector via the production of goods and services, 1994-97[1]

	1994	1995	1996	1997	Year-to-year change Amount	Year-to-year change Percent
	$ Million				$ Million	Percent
Final crop output	100,314	95,805	115,591	112,498	(3,093)	(2.7)
Food grains	9,545	10,417	10,741	10,603	(138)	(1.3)
Feed crops	20,351	24,581	27,265	27,638	374	1.4
Cotton	6,738	6,851	6,983	6,515	(468)	(6.7)
Oil crops	14,657	15,496	16,362	19,911	3,549	21.7
Tobacco	2,656	2,548	2,796	2,886	90	3.2
Fruits and tree nuts	10,335	11,119	11,933	12,790	858	7.2
Vegetables	13,893	14,913	14,561	15,086	525	3.6
All other crops	14,897	15,165	15,935	16,668	732	4.6
Home consumption	72	104	92	78	(13)	(14.7)
Value of inventory adjustment[2]	7,170	(5,390)	8,924	323	na	na
Final animal output	89,691	87,632	92,190	96,200	4,009	4.3
Meat animals	46,785	44,828	44,414	49,925	5,511	12.4
Dairy products	19,935	19,894	22,820	20,989	(1,831)	(8.0)
Poultry and eggs	18,445	19,070	22,345	22,183	(162)	(0.7)
Miscellaneous livestock	3,004	3,227	3,425	3,471	46	1.3
Home consumption	409	365	333	380	47	14.2
Value of inventory adjustment[2]	1,112	248	(1,147)	(749)	na	na
Services and forestry	17,886	19,388	20,671	22,074	1,403	6.8
Machine hire and custom work	2,071	1,928	2,154	2,601	447	20.8
Forest products sold	2,743	2,947	2,824	2,840	16	0.6
Other farm income	4,392	5,213	5,894	6,350	456	7.7
Gross imputed rental value of farm dwellings	8,680	9,300	9,799	10,283	484	4.9
Final agricultural sector output	207,891	202,824	228,452	230,771	2,319	1.0
Less: Intermediate consumption outlays	104,903	109,002	112,852	118,552	5,700	5.1
Farm origin	41,278	41,626	42,675	45,695	3,021	7.1
Feed purchased	22,631	23,829	25,234	25,232	(3)	(0.0)
Livestock and poultry purchased	13,273	12,335	11,229	13,753	2,524	22.5
Seed purchased	5,373	5,462	6,212	6,711	499	8.0
Manufactured inputs	24,398	26,155	28,640	28,964	324	1.1
Fertilizers and lime	9,180	10,033	10,934	10,933	(1)	(0.0)
Pesticides	7,225	7,726	8,526	8,827	301	3.5
Petroleum fuel and oils	5,312	5,427	6,019	6,223	204	3.4
Electricity	2,682	2,968	3,161	2,981	(181)	(5.7)
Other intermediate expenses	39,227	41,220	41,536	43,892	2,356	5.7
Repair and maintenance of capital items	9,083	9,470	10,254	10,394	139	1.4
Machine hire and custom work	4,790	4,792	4,719	4,833	113	2.4
Marketing, storage, transportation expenses	6,821	7,182	6,926	7,106	179	2.6
Contract labor	1,805	1,969	2,129	2,596	467	21.9
Miscellaneous expenses	16,728	17,807	17,508	18,964	1,457	8.3
PLUS: Net Government tranactions	989	106	98	56	(42)	(43.0)
+ Direct Government payments	7,879	7,279	7,340	7,496	156	2.1
- Motor vehicle registration and licensing fees	415	462	423	461	39	9.2
-Property taxes	6,475	6,711	6,819	6,979	160	2.3
Gross value added	103,977	93,929	115,699	112,275	(3,423)	(3.0)
less: Capital consumption	18,695	19,099	19,419	19,520	101	0.5
Net value-added	85,282	74,830	96,280	92,755	(3,524)	(3.7)
LESS: Factor payments	37,015	38,847	42,928	42,931	4	0.0
Employee compensation (total hired labor)	13,506	14,321	15,406	16,011	604	3.9
Net rent received by nonoperator landlords	11,774	11,799	14,301	13,243	(1,057)	(7.4)
Real estate and non-real-estate interest	11,735	12,726	13,221	13,678	457	3.5
Net farm income	48,266	35,984	53,352	49,824	(3,528)	(6.6)

[1]Final sector output is the gross value of the commodities and services produced within a year. Net value-added is the sector's contribution to the national economy and is the sum of the income from production earned by all factors of production. Net farm income is the farm operators' share of income from the sector's production activities. The concept presented is consistent with that employed by the Organization for Economic Cooperation and Development.

[2]A positive value of inventory change represents current-year production not sold by December 1. A negative value is an offset to production from prior years included in current-year sales.

Na = not applicable.

Source: USDA, Economic Research Service, Resource Economics Division

Table 3-4.

Farm income indicators, 1994-97

	1994	1995	1996	1997	Year-to-year change Amount	Year-to-year change Percent
		Million dollars			$ Million	Percent
Gross farm income	215,770	210,104	235,791	238,267	2,476	1.1
Gross cash income	198,326	205,476	217,791	227,952	10,160	4.7
Farm marketings	181,241	188,108	199,580	208,665	9,085	4.6
Crops	93,072	101,090	106,575	112,097	5,522	5.2
Livestock and products	88,169	87,018	93,005	96,568	3,563	3.8
Government payments	7,879	7,279	7,340	7,496	156	2.1
Farm-related income	9,206	10,088	10,872	11,791	919	18.5
Noncash income	9,161	9,770	10,223	10,741	518	5.1
Value of home consumption	481	469	425	458	34	8.0
Rental value of dwellings	8,680	9,300	9,799	10,283	484	4.9
Operator and other dwellings[1]	8,241	8,732	9,167	9,716	549	6.0
Hired laborer dwellings	439	568	631	566	(65)	(10.3)
Value of inventory adjustment	8,283	(5,142)	7,777	(425)	na	na
Total production expenses	167,504	174,120	182,439	188,443	6,004	3.3
Intermediate product	103,513	107,494	111,145	116,417	5,272	4.7
Farm origin	41,278	41,626	42,675	45,695	3,021	7.1
Feed purchased	22,631	23,829	25,234	25,232	(3)	(0.0)
Livestock and poultry purchased	13,273	12,335	11,229	13,753	2,524	22.5
Seed purchased	5,373	5,462	6,212	6,711	499	8.0
Manufactured inputs	24,398	26,155	28,640	28,964	324	1.1
Fertilizer and lime	9,180	10,033	10,934	10,933	(1)	(0.0)
Pesticides	7,225	7,726	8,526	8,827	301	3.5
Fuel and oil	5,312	5,427	6,019	6,223	204	3.4
Electricity	2,682	2,968	3,161	2,981	(181)	(5.7)
Other	37,837	39,713	39,830	41,757	1,927	4.8
Repair and maintenance	9,083	9,470	10,254	10,394	139	1.4
Other miscellaneous	28,754	30,243	29,576	31,364	1,788	6.0
Interest	11,735	12,726	13,221	13,678	457	3.5
Real estate	5,782	6,042	6,359	6,544	185	2.9
Non-real-estate	5,954	6,685	6,862	7,133	272	4.0
Contract and hired labor	15,311	16,290	17,535	18,606	1,071	6.1
Net rent to nonoperator landlords[2]	11,774	11,799	14,301	13,243	(1,057)	(7.4)
Capital consumption	18,695	19,099	19,419	19,520	101	0.5
Property taxes	6,475	6,711	6,819	6,979	160	2.3
NET FARM INCOME[3]	48,266	35,984	53,352	49,824	(3,528)	(6.6)
Gross cash income	198,326	205,476	217,791	227,952	10,160	4.7
Cash expenses	147,648	153,640	161,354	167,168	5,815	3.6
Cash expenses, excluding net rent	134,495	140,433	145,620	152,494	6,874	4.7
Intermediate product	102,566	106,532	109,962	115,142	5,180	4.7
Interest	11,338	12,303	12,785	13,196	411	3.2
Cash labor expenses	14,873	15,722	16,904	18,040	1,136	6.7
Property taxes	5,718	5,876	5,970	6,117	147	2.5
Net rent to nonoperator[4]	13,154	13,206	15,733	14,674	(1,059)	(6.7)
NET CASH INCOME	50,678	51,836	56,438	60,783	4,346	7.7

[1]Value added to gross income. Value added to net farm income equals difference in net farm income and returns to operators.

[2]Includes landlord capital consumption.

[3]Statistics in and above the Net Farm Income line represent the farm sector, defined as including farm operators' dwellings located on farms. Statistics below the Net Farm Income line represent only the farm businesses to the exclusion of the operators' dwellings.

[4]Excludes landlord capital consumption.

Na = not applicable.

Source: USDA, Economic Research Service, Resource Economics Division.

(examples: hogs in North Carolina and dairy in California) has resulted in higher production and lower prices that will persist until higher cost production declines in sufficient quantities to achieve an equilibrium. As an aside, a consequence of this restructuring is that a higher percentage of feed is being purchased as opposed to being grown on the farms producing the livestock.

Farm Household Income

Farm operators have been surveyed by the annual Agricultural Resource Management Study (formerly the Farm Costs and Returns Survey) about the finances and production of their farms since 1985. Beginning in 1988, USDA collected additional information about the operator's household. In 1997, the most recent year for which the survey data are available, about 98 percent of farms were covered in the household definition. Included are those run by individuals, legal partnerships, and family corporations. Nonfamily corporations, cooperatives, and institutional farms are not included in the household definition.

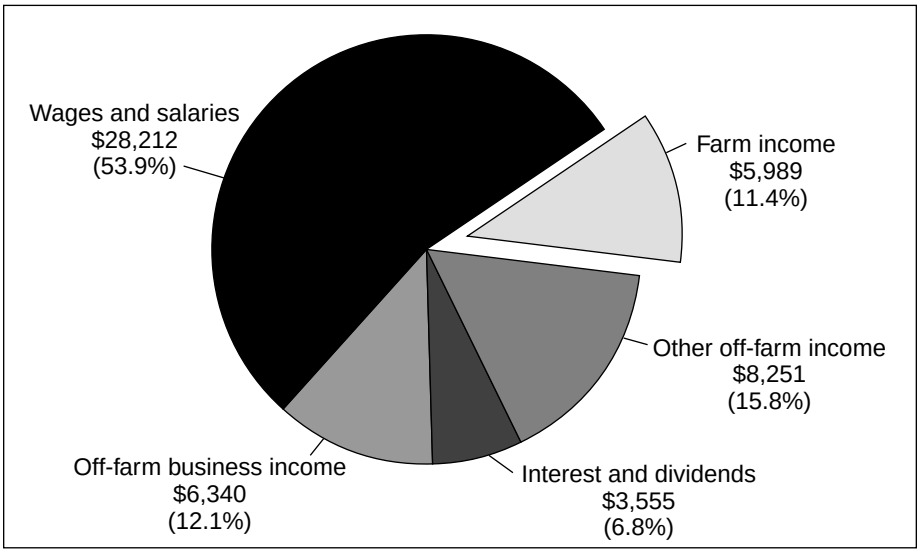
Like many other U.S. households, farm households receive income from a variety of sources, one of which is farming. The 1997 average household income for farm operators households was $52,300, which is on par with the average U.S. household. About 89 percent of the average farm operator's household income came from off-farm sources, and many operators spent most of their work efforts in occupations other than farming. Off-farm income includes earned income such as wages and salaries from an off-farm job and net income from an off-farm business. Off-farm income also includes unearned income, such as interest and dividends, and Social Security.

For the majority of farm operator households, off-farm income is critical. Most U.S. farms are run by households that depend mainly on off-farm income. About 43 percent of operators reported a nonfarm major occupation in 1996, and another 19 percent were retired. Most operators of larger farms reported farming as their major occupation, and their households were more likely to depend on farm income.

Average household income and dependence on off-farm income also varies among types of farm households. For example, 8 percent reported negative household income for 1997. On average, these households lost $47,566 from farming during the year. About 34 percent had household income of $50,000 or over, with farm income averaging $29,025. Among occupational categories, households of operators who reported occupations other than farming or retired had the highest average household income, largely from off-farm sources. Data on operators' age show that households associated with the oldest operators had the lowest average household income. Data on operators' educational level show significant increases in average income with each higher educational level.

Figure 3-3.

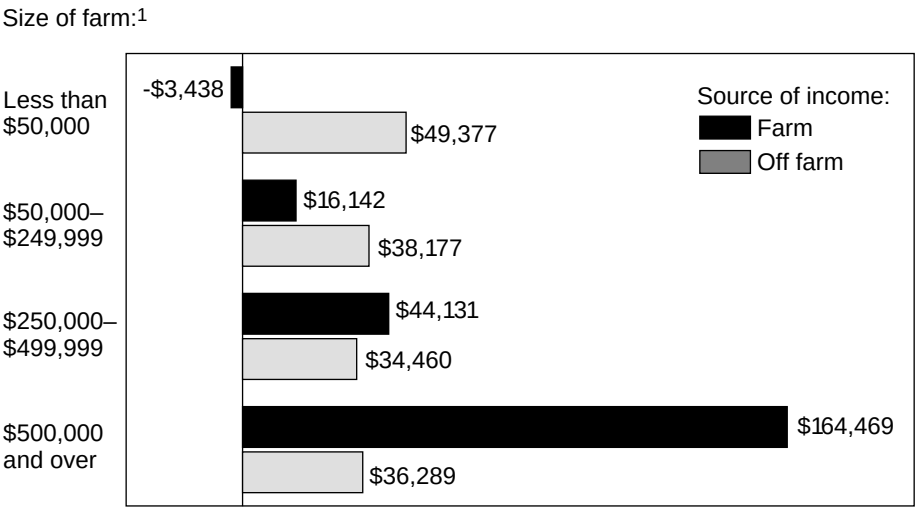
Sources of income for average farm operator household, 1997



Source: USDA, Economic Research Service,
Resource Economics Division, 1997 Agricultural Resource Management Study.

Figure 3-4.

Average farm and off-farm income for farm operator households, by size of farm, 1997



[1] Based on gross value of farm sales, which includes farm businesses', share landlords', and production contractors' shares of agricultural production.

Source: USDA Economic Research Service, Resource Economics Division, 1997 Agricultural Resource Management Study.

Table 3-5.

Farm operator households and household income, by selected characteristics, 1997

Item	*Number of households*	*Average household income*[1]	*Share from off-farm sources* [2]
	Number	Dollars	Percent
All operator households	2,011,568	52,347	88.6
Household income class:			
Negative	151,543	-35,678	-33.3
0-$9,999	178,539	5,302	213.3
$10,000-$24,999	398,564	17,438	112.5
$25,000-$49,999	591,897	36,116	94.7
$50,000 and over	691,025	117,843	75.4
Operator major occupation:			
Farm or ranch work	756,299	48,314	60.8
Other	866,331	63,954	104.7
Retired	388,939	34,335	97.6
Operator age class:			
Under 35 years	153,470	50,842	89.0
35-44 years	378,549	48,597	86.3
45-54 years	503,402	65,194	89.0
55-64 years	423,229	51,795	86.9
65 years or older	552,918	44,058	91.0
Operator educational level:			
Less than high school	312,036	27,879	93.2
High school	870,210	47,750	86.8
Some college	448,285	50,652	87.2
College	381,037	84,877	90.6

[1]The household income of farm operator households includes the net cash farm income that accrues to the farm operation, less depreciation, as well as wages paid to household members for work on the farm, net income from farmland rentals, and net income from another farm business, plus all sources of off-farm income accruing to the household. In cases where the net income from the farm was shared by two or more households, the net cash income was allocated to the primary operator's household based on the share that the operator reported receiving.

[2]Income from off-farm sources is more than 100 percent of total household income if farm income is negative.

Source: USDA, Economic Research Service, Resource Economics Division, 1997 Agricultural Resource Management Study.

Net Farm Income by State

Thirty-one of the 50 States experienced declines in net farm income of varying degrees in 1997 in contrast to the across-the-board increases experienced in the prior year. In order to retain perspective, remember that 1996 was truly an exceptional year with record yields for major crops and prices that remained unusually high. The value of crop production soared in 1996 reflecting rebounds in both acres harvested and yields for major crops.

Crop prices were much higher in the first half of 1996 relative to the same period in 1995 and tended to remain stable in the latter half of the year, despite the rebound in production. Corn and soybeans led the recovery, and the producers of these two crops, along with hogs, were among the principal beneficiaries of favorable prices. Previous growth in the economies of Southeast Asia translated into demand for U.S. agricultural products and helped to support commodity prices and boost farm income. These economies began to falter in the summer of 1997 and began to reduce their demand for imports of agricultural commodities.

In 1997, farmers faced contrasting production and market conditions depending on the types of commodities produced. Cattle producers experienced stable prices throughout the year at levels significantly above the lows of 1996 and benefitted from lower feed as a consequence of declining grain prices. Rising hog prices in the first half of 1997 led hog producers to step up production only to see prices drop once the extent of the production increase became known. Soybean producers experienced soaring prices in the first half of the year as world stocks dwindled but saw prices retreat in the latter half of the year, eventually returning to near beginning-year levels.

Wheat producers suffered perhaps the most market adversity in 1997. Market prices were low at the beginning of 1997 and declined throughout the year. A drop in demand for exports of U.S. wheat resulted from the depreciation in the currency values in many countries. This effectively reduced the demand for imports into the consuming countries and increased the competitive advantage of exporting countries.

Dairy prices were impacted by additional supplies of milk in States not traditionally known for dairy farming. California in particular has experienced a large increase in the production of milk. Expansion is occurring in large, dry-lot dairy operations that by all indications are among the lowest cost producers. Higher cost producers will have to reduce capacity to bring price and quantity into equilibrium. This process is not unlike what has been occurring in hog production for the last 5 years and what occurred in the broiler industry several decades ago.

The contrasting commodity situations yielded some distinctly different regional effects. Leading cattle States, particularly those with cow-calf operations, were the leaders in year-over-year gains in net farm income. Income was up more than 90 percent in Oklahoma and Wyoming. Income was down more than 50 percent in North Dakota (-90), Maine(-75), Wisconsin(-66), and New York(-51). The latter three States are traditional dairy-producing States. The North Dakota agricultural economy is heavily dependent on wheat sales, and producers suffered a one-third drop in production due to lower yields, giving farmers less to sell at lower prices.

California continues to lead the Nation in cash receipts and farm income, reflecting both its substantial land mass and its commodity mix, which is heavily weighted towards those with high value of production per acre. California's net farm income in 1997 slipped 1.7 percent to $5.8 billion, down from $5.9 billion in 1996. Iowa with $3.7 billion, representing a reduction of 7 percent, maintained its position as the State with the second largest net farm income in 1997. Two additional States earned at least $3.5 billion in net farm income for 1997—Texas ($3.6 billion) and North Carolina ($3.5 billion)—and three additional States exceeded $2 billion—Georgia, Illinois, and Nebraska. In contrast, four States had their net farm income plummet in excess of 50 percent: North Dakota (-90), Maine (-75), Wisconsin (-66), and New

York (-51). The latter three States are in the northern tier of the traditional dairy States where producers may be among the higher cost producers. Short growing seasons and cold weather may put producers in the more northern latitudes at a comparative disadvantage to the more Southern States, in terms of costs per unit of output.

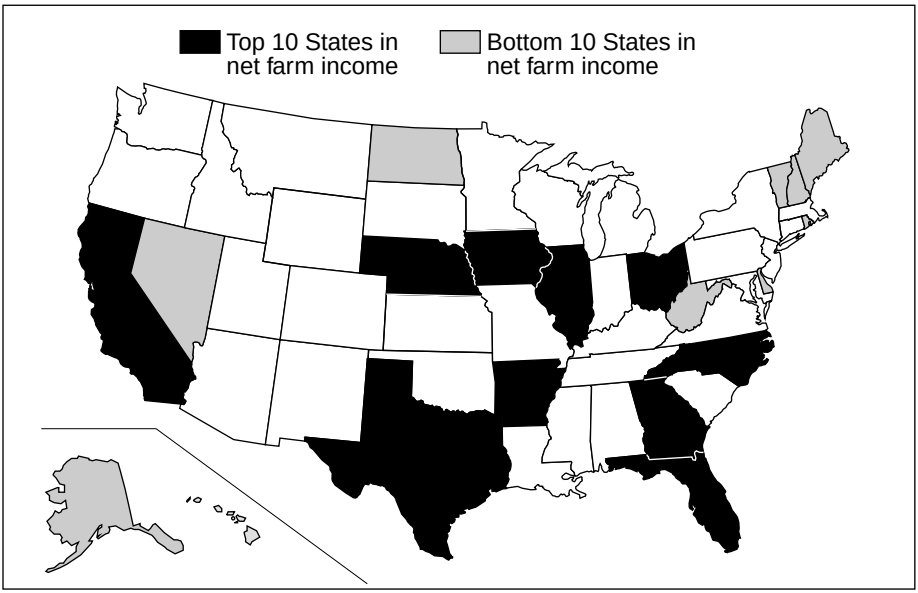
State Rankings by Cash Receipts

The top 10 States in cash receipts for all commodities in 1997 were California, Texas, Iowa, Nebraska, Illinois, Kansas, North Carolina, Minnesota, Florida, and Georgia. The share of total cash receipts derived from crop or livestock sales varied greatly among these 10 top-ranked States.

California led the Nation in crop sales with $19 billion, and was the top producing State for 8 of the sector's top 25 commodities: dairy products, greenhouse and nursery products, hay, grapes, tomatoes, lettuce, almonds, and strawberries. Milk and other commodities in which California is a leading producer tend to be perishable and expensive to transport, either because they are bulky and\or require special handling, such as refrigeration. Three-quarters of California's farm sales were from crops; fruits and nuts equaled 30 percent, vegetables, 24 percent; and greenhouse and nursery, 9 percent. Florida's pattern of cash receipts is similar to California , with vegetables, fruits and nuts, and greenhouse and nursery accounting for 69 percent of agricultural sales. By contrast, 61 percent of Texas' cash receipts were from livestock, and 71 percent of that was cattle and calves. Over 8 percent of the Nation's livestock

Figure 3-5.

Net farm income, 1997



Source: USDA, Economic Research Service, Resource Economics Division

sales value was attributed to Texas. Iowa's sources of cash receipts are, in contrast to those of Texas, more heavily weighted to crops, which comprise 57 percent of the total and livestock 43 percent. Feed grains and oilseeds represented 56 percent of Iowa's sales, while hogs accounted for 23 percent. Iowa leads the Nation in both corn and hog sales.

Cattle and calves remained the top ranked commodity in generation of cash receipts for 1997, as sales surged $5 billion or 16 percent. In fact, the sales of cattle and calves are still $3.3 billion or 8.3 percent below the peak attained in 1993, but 1997 represents a significant reversal of the slide. Historically, cattle production and the related herd size has evidenced the existence of a multi-year cycle, and indications are that cattle had previously been in the downward phase of that cycle. As the largest of the animals produced in significant quantities in the U.S. agricultural sector, cattle have by far the longest gestation period and the longest growth stage in developing into an adult animal for marketing and breeding purposes, all of which contribute to the length of the cycle. Texas led in cattle and calf receipts with $5.8 billion, up $454 million (8.3 percent) from the prior year but still $340 million (-5.5 percent) below its 1993 peak in sales. Nebraska ($4.4 billion) and Kansas ($4.4 billion) were the second and third leading producers of cattle.

Dairy products ranked second in cash receipts, with California remaining the leader in sales with over $3.6 billion. Dairy sales in California slipped $97 million (-2.6 percent) in 1997, but the State's sales have risen $955 million (36 percent) since 1993. This shift is significant, both geographically in the replacement of production in the Lakes States and structurally in the production of milk via large operations. The rapid population growth in California and other adjacent States has created an explosion in the demand for dairy products sufficient to enable large dairies capable of achieving economies of scale to be cost competitive, regionally. Wisconsin was second in dairy sales but lagged considerably behind California in 1997, followed by New York, Pennsylvania, and Minnesota. These five States were the only ones with sales of dairy products exceeding a billion dollars.

Corn and soybeans were the third and fourth-ranked commodities in the Nation, with Iowa and Illinois the undisputed leaders in sales of these commodities. Iowa's corn receipts were highest at $3.8 billion, followed by Illinois with $3.5 billion. Iowa also lead in soybean sales of $3.3 billion followed by Illinois, with $3.1 billion for 1997. This is first time any States have reached the $3 billion level in soybean sales, which indicates what an exceptional year 1997 was for soybean producers.

Table 3-6

States ranked by cash receipts, with 5 leading commodities, 1997[1]

	Total		Livestock and products		Crops		State's top ranking commodities by value of cash receipts				
State	Rank	Cash receipts	Rank	Cash receipts	Rank	Cash receipts	1	2	3	4	5
ALABAMA	26	3,227	15	2,431	34	796	Broilers	Cattle and calves	Cotton	Chicken eggs	Greenhouse/nur.
ALASKA	50	32	50	6	50	26	Greenhouse/nur.	Dairy products	Hay	Potatoes	Cattle and calves
ARIZONA	31	2,145	32	888	29	1,257	Cattle and calves	Dairy products	Lettuce	Cotton	Cantaloups
ARKANSAS	11	5,862	10	3,416	15	2,446	Broilers	Soybean	Rice	Cotton	Cattle and calves
CALIFORNIA	1	25,289	2	6,294	1	18,995	Dairy products	Grapes	Greenhouse/nur.	Cattle and calves	Lettuce
COLORADO	17	4,399	12	3,012	25	1,388	Cattle and calves	Corn	Wheat	Dairy products	Hogs
CONNECTICUT	43	496	43	218	40	279	Greenhouse/nur.	Dairy products	Aquaculture	Chicken eggs	Tobacco
DELAWARE	40	748	39	573	44	174	Broilers	Soybean	Greenhouse/nur.	Corn	Dairy products
FLORIDA	9	6,243	28	1,265	5	4,978	Greenhouse/nur.	Oranges	Tomatoes	Cane for sugar	Dairy products
GEORGIA	10	5,887	9	3,442	16	2,445	Broilers	Cotton	Peanuts	Chicken eggs	Cattle and calves
HAWAII	45	483	48	68	39	415	Pineapples	Cane for sugar	Greenhouse/nur.	Macadamia nuts	Dairy products
IDAHO	24	3,315	25	1,389	20	1,926	Cattle and calves	Dairy products	Potatoes	Wheat	Hay
ILLINOIS	5	9,276	18	1,937	2	7,339	Corn	Soybean	Hogs	Cattle and calves	Dairy products
INDIANA	14	5,506	19	1,896	10	3,610	Corn	Soybean	Hogs	Chicken eggs	Dairy products
IOWA	3	12,841	4	5,530	3	7,311	Corn	Soybean	Hogs	Cattle and calves	Dairy products
KANSAS	6	9,001	5	5,017	8	3,985	Cattle and calves	Wheat	Corn	Sorghum grain	Soybean
KENTUCKY	21	3,633	17	1,978	22	1,655	Tobacco	Horses/mules	Cattle and calves	Soybean	Corn
LOUISIANA	32	2,140	36	659	23	1,481	Cotton	Cane for sugar	Rice	Soybean	Cattle and calves
MAINE	44	486	42	258	42	228	Potatoes	Dairy products	Chicken eggs	Aquaculture	Blueberries
MARYLAND	36	1,538	31	915	35	623	Broilers	Greenhouse/nur.	Dairy products	Soybean	Cattle and calves
MASSACHUSETTS	41	532	46	102	38	430	Cranberries	Greenhouse/nur.	Dairy products	Apples	Sweet corn
MICHIGAN	22	3,588	27	1,352	19	2,236	Dairy products	Greenhouse/nur.	Corn	Soybean	Cattle and calves
MINNESOTA	8	8,155	8	4,054	7	4,101	Soybean	Corn	Dairy products	Hogs	Cattle and calves
MISSISSIPPI	23	3,476	16	2,006	24	1,470	Broilers	Cotton	Soybean	Aquaculture	Cattle and calves
MISSOURI	13	5,564	13	2,795	13	2,768	Soybean	Cattle and calves	Corn	Hogs	Broilers
MONTANA	33	2,063	30	991	30	1,072	Cattle and calves	Wheat	Barley	Hay	Sugar beets
NEBRASKA	4	10,092	3	5,542	6	4,550	Cattle and calves	Corn	Soybean	Hogs	Wheat

—*continued*

Table 3-6

States ranked by cash receipts, with 5 leading commodities, 1997[1]

	Total		Livestock and products		Crops		State's top ranking commodities by value of cash receipts				
State	Rank	Cash receipts	Rank	Cash receipts	Rank	Cash receipts	1	2	3	4	5
NEVADA	47	310	44	180	45	130	Cattle and calves	Hay	Dairy products	Onions	Potatoes
NEW HAMPSHIRE	48	166	47	69	47	97	Dairy products	Greenhouse/nur.	Apples	Cattle and calves	Christmas trees
NEW JERSEY	39	776	45	180	36	596	Greenhouse/nur.	Dairy products	Cranberries	Pepper, green	Blueberries
NEW MEXICO	34	1,915	26	1,354	37	562	Cattle and calves	Dairy products	Hay	Chili peppers	Onions
NEW YORK	28	2,896	21	1,859	31	1,037	Dairy products	Greenhouse/nur.	Apples	Cattle and calves	Corn
NORTH CAROLINA	7	8,302	6	4,694	11	3,608	Hogs	Broilers	Tobacco	Greenhouse/nur.	Turkeys
NORTH DAKOTA	25	3,313	38	611	14	2,702	Wheat	Cattle and calves	Sunflower	Soybean	Barley
OHIO	16	5,345	20	1,869	12	3,476	Soybean	Corn	Dairy products	Greenhouse/nur.	Hogs
OKLAHOMA	18	4,369	11	3,061	27	1,308	Cattle and calves	Wheat	Hogs	Broilers	Greenhouse/nur.
OREGON	27	3,113	34	740	18	2,373	Greenhouse/nur.	Cattle and calves	Hay	Wheat	Dairy products
PENNSYLVANIA	20	4,128	14	2,789	26	1,339	Dairy products	Greenhouse/nur.	Cattle and calves	Chicken eggs	Mushrooms
RHODE ISLAND	49	83	49	9	48	74	Greenhouse/nur.	Dairy products	Sweet corn	Potatoes	Chicken eggs
SOUTH CAROLINA	35	1,695	33	797	32	898	Broilers	Tobacco	Greenhouse/nur.	Cotton	Turkeys
SOUTH DAKOTA	19	4,237	22	1,820	17	2,417	Cattle and calves	Corn	Soybean	Wheat	Hogs
TENNESSEE	30	2,292	29	1,005	28	1,287	Cattle and calves	Soybean	Broilers	Tobacco	Dairy products
TEXAS	2	13,461	1	8,184	4	5,277	Cattle and calves	Cotton	Greenhouse/nur.	Dairy products	Broilers
UTAH	37	953	35	715	41	238	Cattle and calves	Dairy products	Hay	Hogs	Greenhouse/nur.
VERMONT	42	513	40	416	46	97	Dairy products	Cattle and calves	Greenhouse/nur.	Hay	Christmas trees
VIRGINIA	29	2,401	24	1,538	33	863	Broilers	Cattle and calves	Dairy products	Tobacco	Turkeys
WASHINGTON	15	5,382	23	1,604	9	3,778	Apples	Dairy products	Wheat	Cattle and calves	Potatoes
WEST VIRGINIA	46	394	41	324	49	71	Broilers	Cattle and calves	Dairy products	Turkeys	Chicken eggs
WISCONSIN	12	5,756	7	4,070	21	1,686	Dairy products	Cattle and calves	Corn	Soybean	Hogs
WYOMING	38	845	37	646	43	199	Cattle and calves	Sugar beets	Hay	Sheep and lambs	Hogs

[1]All cash receipts are in million dollars.
Source: USDA, Economic Research Service, Resource Economics Division.

Table 3-7

Leading States for cash receipts, 1997[1]

Commodity [1]	Rank	Value	Top 10 States by their value of cash receipts 1	2	3	4	5	6	7	8	9	10
		$ Million	State and $ million									
			CA	TX	IA	NE	IL	KS	NC	MN	FL	GA
Total		208,665	25,289	13,46	112,841	10,092	9,276	9,001	8,302	8,155	6,243	5,887
			TX	CA	NE	IA	KS	NC	WI	MN	GA	AR
Livestock & poultry		96,568	8,184	6,294	5,542	5,530	5,017	4,694	4,070	4,054	3,442	3,416
			CA	IL	IA	TX	FL	NE	MN	KS	WA	IN
Crops		112,097	18,995	7,339	7,311	5,277	4,978	4,550	4,101	3,985	3,778	3,610
			TX	NE	KS	CO	OK	IA	CA	SD	MN	MO
Cattle and calves	1	36,094	5,849	4,385	4,354	2,286	2,009	1,652	1,323	1,188	973	901
			CA	WI	NY	PA	MN	TX	MI	WA	ID	OH
Dairy products	2	20,989	3,618	2,948	1,528	1,526	1,200	787	732	728	634	583
			IA	IL	NE	IN	MN	OH	KS	SD	MO	TX
Corn	3	20,456	3,777	3,524	2,643	1,600	1,325	964	890	782	781	658
			IA	IL	IN	MN	OH	MO	NE	AR	SD	KS
Soybeans	4	18,321	3,293	3,107	1,550	1,511	1,360	1,180	1,053	787	756	628
			GA	AR	AL	NC	MS	TX	MD	DE	CA	VA
Broilers	5	14,151	2,277	2,096	1,653	1,372	1,226	775	532	530	472	445
			IA	NC	MN	IL	NE	IN	MO	OK	OH	KS
Hogs	6	13,197	2,957	2,017	1,169	1,011	833	805	779	423	413	410
			CA	FL	TX	NC	OH	OR	MI	PA	GA	NY
Greenhouse & nursery[2]	7	11,431	2,346	1,134	1,043	943	525	469	433	362	306	266
			KS	ND	MT	WA	OK	ID	SD	TX	MN	CO
Wheat	8	8,926	1,503	1,270	699	694	523	423	402	362	317	309
			TX	CA	GA	MS	AR	NC	LA	AZ	AL	TN
Cotton	9	6,515	1,582	1,097	709	625	562	329	328	294	228	223
			CA	OR	WA	ID	TX	SD	KS	CO	NE	NM
Hay	10	4,633	679	289	258	256	230	224	198	187	163	159

—continued

Table 3-7

Leading States for cash receipts, 1997[1]

Commodity [1]	Rank	Value	Top 10 States by their value of cash receipts 1	2	3	4	5	6	7	8	9	10
		$ Million	State and $ million									
			GA	OH	CA	PA	IN	AR	TX	IA	AL	NC
Chicken eggs	11	4,531	359	357	345	315	300	276	268	242	221	203
			CA	WA	NY	OR	MI	PA	AZ	AR	GA	OH
Grapes	12	3,053	2,816	124	37	21	15	14	14	4	3	2
			NC	KY	TN	SC	VA	GA	FL	OH	IN	PA
Tobacco	13	2,886	1,193	730	228	213	191	158	32	29	26	25
			NC	MN	MO	AR	CA	VA	IN	SC	PA	IA
Turkeys	14	2,880	528	400	236	215	202	189	144	144	97	81
			ID	WA	CA	WI	OR	ND	ME	MN	MI	FL
Potatoes	15	2,259	526	432	152	139	128	113	100	99	80	80
			CA	FL	GA	OH	VA	NJ	IN	SC	TX	TN
Tomatoes	16	1,852	870	610	58	48	44	28	24	23	22	21
			FL	CA	AZ	TX	n.a	n.a	n.a	n.a	n.a	n.a
Oranges	17	1,717	1,128	580	5	3						
			AR	CA	LA	TX	MS	MO	n.a	n.a	n.a	n.a
Rice	18	1,657	717	319	262	168	137	54				
			KS	TX	NE	MO	OK	AR	IL	NM	SD	LA
Sorghum grain	19	1,619	666	450	204	86	60	29	28	21	20	19
			CA	AZ	NJ	NM	CO	OH	FL	NY	WA	n.a
Lettuce	20	1,608	1,251	303	14	13	10	6	6	3	3	
			WA	CA	NY	MI	PA	VA	ID	NC	OR	MA
Apples	21	1,527	817	167	126	92	53	29	18	17	16	16
			MN	ID	ND	CA	MI	MT	WY	CO	NE	WA
Sugar beets	22	1,349	389	239	194	128	126	59	58	54	45	25
			CA	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a	n.a
Almonds	23	1,127	1,127									
			GA	TX	AL	NC	VA	OK	FL	NM	SC	AZ
Peanuts	24	932	363	193	102	88	55	54	54	14	9	1
			CA	FL	OR	NC	NY	MI	WI	PA	WA	LA
Strawberries	25	908	686	146	20	13	10	7	6	5	5	4

n.a. = not applicable

[1]The 25 leading commodities ranked by value of farm marketings. [2]Excludes mushrooms.

Source: USDA, Economic Research Service, Resource Economics Division

Government Payments by Program and State

Government payments of $7.3 billion in 1996 and $7.5 billion 1997 were significantly lower than the average for the first half of the 1990's. Total payments in both years were slightly higher than those of 1995 but 45 percent lower than the $13.4 billion in 1993 which was the highest level since 1988. Direct government payments were expected to begin declining with the 1996 Farm Act. Even though the payments in 1996 and later years reflect the production flexibility payments provided under the 1996 Act, adjustments for deficiency payments owed to farmers for some commodities in 1996 and repayments by farmers for overpayments under the previous farm program also are included in 1996 and 1997 payments.

Under the old farm program, deficiency payments due to producers were made in as many as three payments, in 2 calendar years. The first payment was based on an estimation of the final amount likely to be owed to the producer, using projected market prices over the relevant period; and subsequent payments were then the balance due once the actual market prices became known.

During the 1995/96 marketing year, commodity prices received by farmers tended to be higher than had been projected when determining initial deficiency payments for the 1995/96 crops. For many producers, this meant that the disbursement received as the first deficiency payment for the 1995 crops exceeded the amount they were due, once all the information necessary to complete the final determination became available. As a consequence, they were required to reimburse USDA; and these reimbursements were then available for disbursement under production flexibility contract payments.

After 1997, the influence of the deficiency repayment adjustments should be concluded and the payment totals will more closely follow the declining levels of production flexibility contract payments specified in the 1996 Farm Act. The payment totals will be constrained by the fixed funding set forth for production flexibility contracts in the 1996 Farm Act through the year 2002.

Innovative legislation was implemented in 1996

As a refresher, new legislation enacted effective for 1996 represented a significant departure from that which it replaced, mandating sweeping changes in the operational design of Federal farm programs for a period of 7 years. Under the new farm programs, government payments to farmers will decline over 7 years in both absolute terms and as a proportion of production income. Both the declining payments and diminishing role of the Government crystallized in the new legislation represent extensions of trends under which Government assistance as a share of production income was already in a decline.

The 1996 Farm Act, more formally known as The Federal Agriculture Improvement and Reform Act of 1996, signed in April1996, initiated a new Government farm policy for 1996 through 2002 that disconnects the link between production history and the level of Federal support payments. The legislation also severed the links between Government payments and the crops produced and commodity prices. During the 7-year period covered by the 1996 Act, payments determined during a one-time, sign-up window in 1996 are scheduled to decline.

The payments are a function of the farmer's established program crop acreage times the established program yield multiplied (per a formula) by a set payment rate. The crop acreage and program yields remain constant throughout the 7 years, but payment rates are scheduled to generally decline. Nonrecourse marketing loans administered by the Commodity Credit Corporation remain available for the contract crops, oilseeds, and extra long staple cotton. The loan rates are generally much lower than past support levels and marketing loans are available to producers. Consequently, farmers don't necessarily have to place the commodity under loan in order to receive the benefits for which they are eligible and the Government's potential financial exposure through loan defaults is reduced.

Restrictions: Farmers are not bound to plant any particular set of crops and have flexibility as to what they do plant, with some exceptions pertaining to fruits and vegetables. Two requirements that farmers must meet are to comply with established conservation measures and either buy crop insurance or sign a waiver to all Federal disaster assistance.

Exceptions: The legislation contains special language for peanuts and sugar that generally maintains the structure of those programs established under the previous legislation but at lower support levels, thereby reducing the Government's exposure. The dairy price support program will be phased out over 4 years and the dairy milk marketing orders are to be reduced by two-thirds in 3 years. Tobacco program provisions are covered under separate legislation and are not affected by the 1996 Farm Act.

Number of Farms and Net Cash Income by Sales Class

The number of farms decreased slightly to 2,057,910 in 1997, and the percent of farms in each major sales class changed somewhat. Almost three quarters of all U.S. farms have annual sales of less than $50,000, while approximately 1 percent of all farms have sales greater than $1 million. Farms with over $250,000 in sales account for less than 7 percent of all farms but dominate American agricultural output. These large farms sell 65 percent of the Nation's livestock and 61 percent of the crops. They have 61 percent of the gross cash income compared with 59 percent of the cash expenses. In 1997 they accounted for 67 percent of the Nation's net cash income. Approximately 35 percent of direct Government payments went to these farms.

Table 3-8

Government payments, by program and State, 1997[1]

State	Feed grain	Wheat	Rice	Cotton	Wool Act	Conservation[2]	Miscellaneous[3]	Total
				1,000	*dollars*			
Alabama	(318)	(3)	0	(112)	0	25,138	41,081	65,785
Alaska	0	0	0	0	0	990	500	1,490
Arizona	(140)	(59)	0	(933)	(7)	787	47,019	46,667
Arkansas	(1,502)	(394)	7	(505)	0	12,912	264,339	274,857
California	(1,022)	(147)	(11)	(1,217)	6	13,200	209,727	220,536
Colorado	(8,687)	(318)	0	0	0	78,338	106,292	175,626
Connecticut	(77)	0	0	0	0	162	1,299	1,384
Delaware	(571)	(1)	0	0	0	347	5,950	5,725
Florida	(106)	(1)	0	(11)	0	5,967	13,198	19,047
Georgia	(892)	(38)	0	(249)	0	27,866	82,520	109,207
Hawaii	0	0	0	0	0	163	391	554
Idaho	(301)	(528)	0	0	1	38,583	72,675	110,429
Illinois	(81,151)	(135)	0	0	0	62,071	571,701	552,486
Indiana	(44,556)	(71)	0	0	0	30,364	279,429	265,166
Iowa	(86,847)	(1)	0	0	0	148,216	651,533	712,901
Kansas	(29,526)	(1,356)	0	0	0	151,940	408,725	529,784
Kentucky	(7,354)	(39)	0	0	0	22,353	68,107	83,067
Louisiana	(824)	(42)	(27)	(534)	0	7,578	151,195	157,346
Maine	(66)	0	0	0	0	2,170	2,093	4,197
Maryland	(1,962)	(4)	0	0	0	2,152	19,304	19,490
Massachusetts	(45)	0	0	0	0	211	1,030	1,196
Michigan	(19,121)	(90)	0	0	1	20,854	119,642	121,287
Minnesota	(56,472)	(540)	0	0	(5)	86,946	387,120	417,049
Mississippi	(629)	(26)	5	(520)	0	35,562	135,469	169,861
Missouri	(15,484)	(145)	0	(72)	0	104,659	189,108	278,066
Montana	(422)	(571)	0	0	1	101,164	130,745	230,918
Nebraska	(82,023)	(282)	0	0	0	69,287	467,616	454,598

—*continued*

Table 3-8

Government payments, by program and State, 1997[1]

State	Feed grain	Wheat	Rice	Cotton	Wool Act	Conservation[2]	Miscellaneous[3]	Total
				1,000	dollars			
Nevada	(1)	(5)	0	0	0	940	1,161	2,096
New Hampshire	(30)	0	0	0	0	172	747	889
New Jersey	(537)	0	0	0	0	226	3,940	3,629
New Mexico	(1,228)	(35)	0	(25)	0	18,201	22,085	38,998
New York	(4,622)	(13)	0	0	0	4,601	39,667	39,633
North Carolina	(3,349)	(28)	0	(61)	0	17,744	73,459	87,764
North Dakota	(5,178)	(1,305)	0	0	5	103,387	264,640	361,549
Ohio	(25,323)	(146)	0	0	0	25,899	185,998	186,429
Oklahoma	(1,622)	(916)	0	(66)	0	49,644	158,561	205,601
Oregon	(103)	(170)	0	0	2	26,371	37,328	63,429
Pennsylvania	(2,910)	(3)	0	0	0	7,447	30,936	35,471
Rhode Island	(1)	0	0	0	0	35	88	122
South Carolina	(1,325)	(35)	0	(80)	0	12,242	32,242	43,044
South Dakota	(18,150)	(262)	0	0	0	70,459	216,067	268,113
Tennessee	(2,899)	(53)	3	(97)	0	20,310	58,944	76,209
Texas	(23,460)	(579)	(30)	(1,366)	10	157,557	516,435	648,567
Utah	(154)	(8)	0	0	0	9,491	10,767	20,095
Vermont	(129)	0	0	0	0	741	2,481	3,093
Virginia	(1,580)	(21)	0	(2)	0	5,989	26,204	30,590
Washington	(373)	(556)	0	0	0	53,529	94,680	147,279
West Virginia	(183)	(0)	0	0	0	2,425	3,433	5,675
Wisconsin	(26,168)	(9)	0	0	0	45,635	157,114	176,572
Wyoming	(302)	(29)	0	0	(3)	10,241	12,481	22,387
United States	(559,723)	(8,964)	(54)	(5,851)	14	1,693,264	6,377,266	7,495,953

[1]Includes both cash payments and payment-in-kind (PIK). [2]Includes amount paid under agriculture and conservation programs (Conservation Reserve, Agricultural Conservation, Emergency Conservation, and Great Plains Program). [3]Includes Production Flexibility Contracts Payments under the 1996 Farm Act. Other programs included in the miscellaneous category are Rural Clean Water, Forestry Incentive Annual, Dairy Indemnity, Extended Warehouse Storage, Extended Farm Storage, Livestock Emergency Assistance, Interest Payments, Disaster, Loan Deficiency, Market Gains, Milk Marketing Fee, Options Pilot, Limitation Refund, Additional Interest, Noninsured Assistance, Interest on NAP, Karnal Bunt Fungus, Production Flexibility, Reserve, Environment Quality Incentives, 90-Day Rule, Potato Diversion, Colorado River Salinity, and Wetlands Reserve.

Note: Unanticipated adjustments for deficiency payments owed to farmers in 1996 and repayments owed by farmers under the previous farm program are included in 1996 and 1997 payments. The negative numbers represent repayments by farmers.

Source: USDA, Economic Research Service, Resource Economics Division.

Table 3-9

Direct Government payments, by program, United States, 1950-97[1]

Year	Feed grains	Wheat	Rice	Cotton	Wool	Conservation[2]	Miscellaneous[3]	Total
				Million dollars				
1950	np	np	np	np	np	246	37	283
1951	np	np	np	np	np	246	40	286
1952	np	np	np	np	np	242	33	275
1953	np	np	np	np	np	181	32	213
1954	np	np	np	np	np	217	40	257
1955	np	np	np	np	np	188	41	229
1956	np	np	np	np	54	220	280	554
1957	np	np	np	np	53	230	732	1,015
1958	np	np	np	np	14	215	859	1,088
1959	np	np	np	np	82	233	367	682
1960	np	np	np	np	51	223	429	703
1961	772	42	np	np	56	236	387	1,493
1962	841	253	np	np	54	230	368	1,746
1963	843	215	np	np	37	231	370	1,696
1964	1,163	438	np	39	25	236	278	2,179
1965	1,391	525	np	70	18	224	235	2,463
1966	1,293	679	np	773	34	231	267	3,277
1967	865	731	np	932	29	237	284	3,078
1968	1,366	747	np	787	66	229	268	3,463
1969	1,643	858	np	828	61	204	199	3,793
1970	1,504	871	np	919	49	208	166	3,717
1971	1,054	878	np	822	69	173	149	3,145
1972	1,845	856	np	813	110	198	140	3,962
1973	1,142	474	np	718	65	72	136	2,607
1974	101	70	np	42	[4]	192	125	530
1975	279	77	np	138	13	193	107	807
1976	196	135	[4]	108	39	209	47	734
1977	187	887	130	89	5	328	192	1,818
1978	1,172	963	3	127	27	239	499	3,030
1979	494	114	59	185	33	197	294	1,376
1980	382	211	2	172	28	214	276	1,285
1981	243	625	2	222	35	201	605	1,933
1982	713	652	156	800	46	179	946	3,492
1983	1,346	864	278	662	84	188	5,874	9,296
1984	367	1,795	192	275	118	191	5,493	8,431
1985	2,861	1,950	577	1,106	98	189	924	7,705
1986	5,158	3,500	423	1,042	112	254	1,325	11,814
1987	8,490	2,931	475	1,204	144	1,531	1,972	16,747
1988	7,219	1,842	465	924	117	1,607	2,306	14,480
1989	3,141	603	671	1,184	81	1,771	3,436	10,887
1990	2,701	2,311	465	441	96	1,898	1,386	9,298
1991	2,649	2,166	550	407	154	1,858	431	8,215
1992	2,499	1,403	512	751	188	1,899	1,916	9,168
1993	4,844	1,909	650	1,226	173	1,967	2,633	13,402
1994	1,447	1,156	337	826	202	1,978	1,933	7,879
1995	3,024	587	784	30	98	1,896	860	7,279
1996[5]	(384)	(473)	175	(105)	56	1,793	6,279	7,340
1997	(560)	(9)	0	(6)	0	1,693	6,377	7,496

np = no program. [1]Components may not add due to rounding. Includes both cash payments and payments-in-kind (PIK). [2]Includes Great Plains and other conservation programs. [3]Through 1970, total amounts are for Soil Bank program, which was discontinued in 1971. Starting with 1971, amounts include all other programs. [4]Less than $500,000. [5]Commodity specific payments in 1996 reflect final deficiency payments due farmers under previous law, as well as repayments by farmers of unearned deficiency payments disbursed in advance of final determination. Production flexibility payments under the 1996 Farm Act are included in the miscellaneous category.

Source: USDA, Economic Research Service, Resource Economics Division.

Table 3-10.

Number of farms and net cash income by size class, 1997[1]

Item	$1,000,000 and over	$500,000 to $999,999	$250,000 to $499,999	$100,000 to $249,999	$50,000 to $99,999	$20,000 to $49,999	Less than $20,000
			Thousands				
Number of farms	19	35	83	207	188	270	1,257
			Million dollars				
Gross cash income	71,104	31,298	36,324	43,506	20,679	12,675	12,366
Cash receipts from marketings	68,126	29,470	33,590	39,828	18,470	11,049	8,132
Crops	33,421	15,419	19,621	24,024	9,861	6,485	3,265
Government supported	4,886	6,743	10,210	11,722	4,718	2,660	867
Nonsupported	28,535	8,676	9,411	12,303	5,143	3,825	2,398
Livestock	34,706	14,051	13,969	15,803	8,609	4,564	4,867
Government payments	470	762	1,397	2,051	974	962	880
Farm-related income	2,508	1,067	1,337	1,627	1,235	664	3,353
Cash expenses	50,015	21,367	26,650	31,306	14,065	10,004	13,762
Net cash income	21,090	9,932	9,674	12,200	6,614	2,671	(1,397)
			Percent				
Percent of total:							
Number of farms	0.9	1.7	4.0	10.1	9.1	13.1	61.1
Gross cash income	31.2	13.7	15.9	19.1	9.1	5.6	5.4
Cash receipts from marketings	32.6	14.1	16.1	19.1	8.9	5.3	3.9
Crops	29.8	13.8	17.5	21.4	8.8	5.8	2.9
Government supported	11.7	16.1	24.4	28.0	11.3	6.4	2.1
Nonsupported	40.6	12.3	13.4	17.5	7.3	5.4	3.4
Livestock	35.9	14.6	14.5	16.4	8.9	4.7	5.0
Government payments	6.3	10.2	18.6	27.4	13.0	12.8	11.7
Farm-related income	21.3	9.0	11.3	13.8	10.5	5.6	28.4
Cash expenses	29.9	12.8	15.9	18.7	8.4	6.0	8.2
Net cash income	34.7	16.3	15.9	20.1	10.9	4.4	-2.3

—*continued*

Table 3-10.

Number of farms and net cash income by size class, 1997[1]

Item	$1,000,000 and over	$500,000 to $999,999	$250,000 to $499,999	$100,000 to $249,999	$50,000 to $99,999	$20,000 to $49,999	Less than $20,000
			Dollars				
Per farm operation: [1]							
Gross cash income	3,788,552	900,997	437,983	210,210	110,145	46,934	9,840
Cash receipts from marketings	3,629,883	848,350	405,024	192,438	98,378	40,912	6,471
Crops	1,780,711	443,872	236,587	116,080	52,524	24,014	2,598
Government supported	260,341	194,099	123,107	56,637	25,130	9,849	690
Nonsupported	1,520,370	249,773	113,480	59,443	27,394	14,165	1,908
Livestock	1,849,172	404,479	168,437	76,358	45,854	16,898	3,873
Government payments	25,054	21,933	16,840	9,910	5,187	3,563	700
Farm-related income	133,615	30,714	16,119	7,862	6,581	2,459	2,668
Cash expenses	2,664,864	615,090	321,339	151,263	74,918	37,043	10,951
Net cash income	1,123,688	285,907	116,644	58,947	35,227	9,891	(1,111)

[1]Farm operations may have several households sharing in the earnings of the business (for example, partners or shareholders in the farm corporation). The number of households per farm operation tends to increase as sales per farm increase.

Source: USDA,Economic Research Service, Resource Economics Division

4. Rural America

Nonmetropolitan Population

Today, the United States is primarily metropolitan. People who live in large cities and their suburbs account for 80 percent of the total population. Nonmetropolitan people outside large cities and suburban counties numbered about 54.5 million in 1998. Although nonmetro population continues to increase, its proportion of the total population has fallen slightly over the last several decades because the metro population grew even more rapidly.

A metro area, by definition, must have an urban nucleus of at least 50,000 people, and may include fringe counties that are linked to that nucleus because their workers commute to the central area. All other counties are nonmetro.

After 1970, most nonmetro counties that were losing population in the 1960's began to grow again because of job development, commuting, or the development of retirement communities that drew retirees in from other areas. However, after 1980, low farm income and a slump in mining and manufacturing employment led to a slow but widespread decline in nonmetro population, generally in the same areas that declined before 1970. Some nonmetro counties, though, grew enough as retirement or recreation areas, or from their proximity to metro jobs, to produce overall nonmetro population growth during the decade.

Since 1990, there is evidence once again of increased retention of people in nonmetro areas. From 1990 to 1996, the population of nonmetro counties grew at an annual pace more than double that of the 1980's, with far fewer counties declining. This change has affected all types of counties and most regions of the country. Improvement in nonmetro economic conditions is thought to be generally responsible for this change. But, recreation and retirement counties continue to be the most rapidly developing group. Declining population is still characteristic of areas that are dependent on farming, three-fourths of which have continued to have more people moving out than in. The nonmetro population grew between 1996 and 1998, but the pace of growth has slowed.

Age and Race

Age distributions reflect past demographic events (births, deaths, and migrations) and provide important clues about future changes in the labor supply and the demand for goods and services. The age distribution of the U.S. population is still dominated by the post-World War II rise in fertility rates known as the baby boom, whose members were born in 1946-64. From the time the youngest baby boomers

graduated from high school and began their entry into the labor force in 1982 until the oldest members reach age 65 in 2011, the United States has had and will continue to have a favorable balance of people in income-producing age groups. All parts of the country benefit from the current age structure.

Because of migration, which consists primarily of young adults and their children, metro areas captured a much higher percentage of the "baby boomers." The higher metro percentage of working-age adults has been a persistent pattern for most of this century. Metro/nonmetro differences among the youngest and oldest have become increasingly large. In a reversal of previous trends, the birth rates in metro areas in this decade have been greater than in nonmetro areas. In large measure, this reversal is due to the delayed childbearing among women in the large metro baby boom segment. Birth rates for nonmetro women are higher at younger ages, particularly for women in their twenties, an age group not well represented in nonmetro areas.

Increases in life expectancy over the past 50 years and the aging of the large population segment born in the 1920's increased the proportion of elderly between 1970 and 1998. The percentage of the population over age 75 rose dramatically, especially in nonmetro areas. Retirement migration to nonmetro areas, coupled with historically high levels of nonmetro outmigration of young adults and their children, has resulted in a slightly higher proportion of older people in nonmetro areas: the percentage of the nonmetro population age 60 or older was 18 percent in 1998, 15 percent in metro areas. For the first time since 1960, children under age 10 outnumber preteens and teenagers in metro areas. This is not true for nonmetro areas.

The minority population is truly in the minority in nonmetro areas, although their percentage is growing. By 1997 minorities constituted 17 percent of the total nonmetro population, accounting for more than half of the population growth since 1980. Minorities are still much more likely than Whites to live in metro areas, but their presence in nonmetro areas is increasing.

The relatively high proportion of the population under age18 in all the rural minority groups indicates that there is a large pool of potential labor force entrants among minorities and that minorities have a sizable proportion of their own population to support. This is partly fueled in the rural Asian and Hispanic populations by the higher birth rates among recent immigrants. Well over a third of the population of all four rural minority groups were under age 18 in 1997, compared with a fourth of the White population (table 4-1). The proportion in prime labor force ages between 25 and 44 is similar for all groups, including Whites.

In 1997, 9 million nonmetro residents belonged to one of four minority groups—Blacks, Hispanics, Asians (including Pacific Islanders), and Native Americans. Blacks made up close to two-thirds of the nonmetro minority population in 1980, but their share has declined since then as the rate of growth for other groups has increased. In 1997, 54 percent of the nonmetro minority population was Black.

Table 4-1.

Nonmetro minority populations by age, 1997

Age group	White	Black	Native American	Hispanic	Asian/Pacific Islander
			Percent		
17 or younger	25.0	36.4	39.3	40.0	43.9
18-24	8.7	12.9	11.6	12.7	9.2
25-44	28.7	26.6	25.9	29.3	27.0
45-59	17.5	13.4	14.1	10.7	11.7
60-74	13.5	7.6	7.2	5.7	6.4
75 and older	6.6	3.2	1.9	1.6	1.8
			Thousands		
Population	43,458	4,877	888	2,789	488

Source: Prepared by ERS using data from the March 1997 Current Population Survey, Bureau of the Census.

Nonmetropolitan Industry and Job Growth

Goods-Producing Industries

Manufacturing, natural resource-based industries such as farming and mining, and other goods-producing industries have historically been the mainstay of the rural economy. Growth in rural goods-producing jobs was stronger during the 1970's than during the 1980's or so far in the 1990's. Much of the growth during the 1970's was attributable to national manufacturing firms that opened branch plants in rural areas and also to booming construction activities. While goods-producing industries normally spring back during economic recovery, in more recent years, over periods of recession and recovery, job growth in these industries has been sluggish. In nonmetro areas during the 1980's, jobs in farming declined by 383,000 (1.8 percent annually) and jobs in mining declined by 118,000 (2.4 percent annually), while manufacturing increased by 20,000 jobs (table 4-2). Nonmetro areas also lost goods-producing jobs during the 1990-91 recession, but have gained jobs in more recent years. Between 1989 and 1997, the total number of nonmetro goods-producing jobs increased by 433,000. The new jobs were in construction (324,000), manufacturing (200,000), and agricultural services/forestry/fishing (153,000). Those gains were partially offset by declines in farming (156,000) and mining (88,000) jobs.

Services-Producing Industries

Nonmetro services-producing industries grew steadily during 1969-97, creating 8.8 million new jobs in the period. Similar to the goods-producing industries, the number of rural services-producing jobs grew faster during the 1970's (2.5 percent annually) than during the 1980's (1.8 percent annually). During 1989-97, job growth in the rural services-producing sector picked up, growing almost as fast as during the

Table 4-2.

Nonmetro and metro job growth in selected industries, 1969-97

Industry	*1969*	*1979*	*1989*	*1997*	*Change 1989-97*
		Thousands			*Percent*
Nonmetro total	17,704	21,668	23,942	27,687	1.8
Goods-producing	7,480	8,532	8,216	8,649	0.6
Farm	2,564	2,351	1,968	1,812	-1.0
ASFF[1]	166	242	355	508	4.6
Mining	361	550	432	344	-2.8
Construction	800	1,177	1,228	1,552	3.0
Manufacturing	3,589	4,213	4,233	4,433	0.6
Services-producing	10,224	13,136	15,726	19,039	2.4
TCPU[2]	725	904	972	1,153	2.2
Wholesale trade	423	753	781	867	1.3
Retail trade	2,541	3,224	3,896	4,804	2.7
FIRE[3]	734	1,052	1,095	1,315	2.3
Services	2,718	3,620	4,997	6,526	3.4
Government	3,082	3,583	3,986	4,373	1.2
Metro total	73,353	91,620	113,375	128,723	1.6
Goods-producing	22,755	24,658	24,691	24,892	0.1
Farm	1,414	1,413	1,228	1,142	-0.9
ASFF[1]	340	626	1,019	1,465	4.6
Mining	374	605	614	489	-2.8
Construction	3,670	4,729	6,064	6,813	1.5
Manufacturing	16,957	17,284	15,765	14,983	-0.6
Services-producing	50,597	66,962	88,684	103,831	2.0
TCPU[2]	4,070	4,723	5,393	6,398	2.2
Wholesale trade	3,675	4,920	5,924	6,311	0.8
Retail trade	10,908	14,556	18,794	21,552	1.7
FIRE[3]	5,181	7,487	9,572	10,463	1.1
Services	14,005	20,463	32,239	41,702	3.3
Government	12,759	14,814	16,762	17,407	0.5

[1]Agricultural services, forestry, and fishing
[2]Transportation, communication, and public utilities
[3]Finance, insurance, and real estate
Source: Prepared by ERS using data from the U.S. Department of Commerce, Bureau of Economic Analysis.

1970's (2.4 percent annually). General services, such as hotel accommodations, hair cuts, car repair, and entertainment, provided the largest number of new rural jobs (1.5 million). Nonmetro retail trade added 980,000 new jobs, growing faster (2.7 percent annually) so far in the 1990's than it had in the two previous decades (2.4 and 1.8 percent annually in the 1970's and 1980's).

Total Employment

Nonmetro areas gained jobs at a rate comparable to that of metro areas during the 1970's, but fell far behind metro growth during the 1980's. Nonmetro areas suf-

fered more in the two recessions of the early 1980's and benefitted less from the 1982-1989 recovery than did metro areas. As a result, employment growth was considerably slower in nonmetro (1 percent annually) than in metro areas (2.2 percent annually) during 1979-89. More encouraging is the most recent performance of rural areas. In contrast to the 1980's trend, rural areas weathered the 1990-91 recession better than urban areas. In nonmetro areas, total jobs grew at a 1.8 percent annual rate during 1990-97; in metro areas, jobs grew at a 1.6 percent annual rate (table 4-2). Most of the growth in both areas was in services-producing industries, 3.3 million out of 3.7 million new nonmetro jobs and 15.1 out of 15.3 million new metro jobs. Goods-producing industries contributed 433,000 new nonmetro jobs while metro areas gained only 201,000 goods-producing jobs.

Nonmetropolitan Employment and Wages

In 1998, 25.5 million people 16 years old and older were in the nonmetropolitan work force, either at work or looking for work. On average, 1.2 million or 4.8 percent of these workers were unemployed during the year. The continuing national economic expansion has brought about the lowest nonmetro unemployment rate in 25 years, with widespread reductions in unemployment among all groups of workers, including minorities and teenagers. In 1998, 14.1 percent of teenagers, 10.3 percent of Blacks, and 7.1 percent of Hispanics in nonmetro areas were unemployed (table 4-3). These rates, however, remain well above the 1998 average for nonmetro Whites (4.2 percent). The official unemployment rate excludes those jobless people not actively seeking work, but who indicate they want or are available for work (marginally attached workers), and part-time workers who want full-time jobs. The nonmetro adjusted unemployment rate, which includes marginally attached workers and involuntary part-time workers, was 8.8 percent.

Nonmetro unemployment rates in 1998 were slightly higher than metro rates (4.8 and 4.4 percent, respectively.) During the 1980's, nonmetro unemployment rates were consistently higher in nonmetro areas than in metro, but below the metro rate for a few years after the 1990-91 recession (figure 4-1). The nonmetro adjusted unemployment rate has remained higher than the metro rate throughout the 1990's. In 1998, the nonmetro unadjusted rate of 8.8 percent was somewhat above the 7.9 percent metro rate.

Nonmetro earnings have risen during the 1990's, in contrast to the earnings losses of the previous decade. The inflation-adjusted, average nonmetro weekly earnings for wage and salary workers fell 12.6 percent between 1979 and 1990, from $491 to $429 (1998 dollars). Average metro weekly earnings fell a smaller 1.4 percent between 1979 and 1993. As a result, the metro/nonmetro average weekly earnings gap grew sharply, increasing from $73 to $127 (1998 dollars). From 1990 to 1998, however, nonmetro weekly earnings increased 7.8 percent, to $462 (1998 dollars), while metro earnings were up 5.4 percent (table 4-4). The absolute dollar value of the metro-nonmetro wage gap has changed little during the 1990's, but nonmetro earnings have risen at a faster rate than metro earnings.

Table 4-3.

Unemployment rates among various metro and nonmetro groups, 1998

	Nonmetro	*Metro*	*U.S.*
		Thousands	
Civilian labor force	25,510	112,163	137,673
Total employment	24,289	107,174	131,463
Unemployed	1,221	4,989	6,210
Unemployment rate:			
		Percent	
All civilian workers	4.8	4.4	4.5
Men	4.7	4.4	4.4
Women	4.9	4.6	4.6
Teenagers	14.1	14.7	14.6
White	4.2	3.8	3.9
Black	10.3	8.7	8.9
Hispanic	7.1	7.2	7.2
Adjusted unemp. rate[1]	8.8	7.9	8.0

[1]Unemployment rate adjusted to include marginally attached workers and workers employed part-time for economic reasons.
Source: Current Population Survey, Bureau of the Census.

Table 4-4.

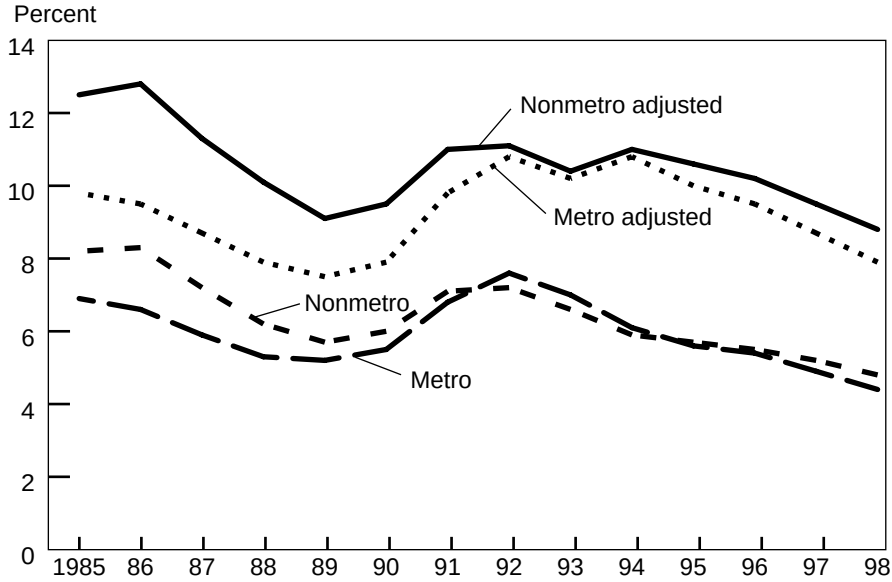
Average weekly earnings for metro and nonmetro wage and salary workers, 1979-98

	U.S.	*Metro*	*Nonmetro*	*Metro-Nonmetro Wage Gap*
		1998 dollars		
1979	541	564	491	73
1990	530	556	429	127
1998	564	586	462	124
		Percent		
1979-90 change	-2.0	-1.4	-12.6	74.0
1990-98 change	6.4	5.4	7.8	-2.4

Source: Prepared by ERS using data from the Current Population Survey, Bureau of the Census.

Figure 4-1.

Unemployment rates by residence, 1985-98



Note: Beginning in the first quarter of 1994, the adjusted unemployment rate is defined as the total unemployed, plus all marginally attached workers, plus total employed part time for economic reasons, as a percent of the civilian labor force, plus all marginally attached workers (U-6). Prior to the first quarter of 1994, the adjusted unemployment rate is defined as total unemployed, plus discouraged workers, plus one-half of workers part time for economic reasons as a percent of the civilian labor force, plus all discouraged workers.
Source: Current Population Survey, Bureau of the Census.

Nonmetropolitan Income and Poverty

Nonmetropolitan median household income increased by 4.6 percent from 1996 to 1997 after adjustment for inflation, going from $28,734 to $30,057. The median income of metropolitan households increased 2.3 percent, from $38,504 to $39,381. With nonmetro income growing more than metro income, the income gap between nonmetro and metro households narrowed slightly. Nonmetro household income lagged metro household income by 23.7 percent in 1997, down from a 25.4 percent gap in 1996. In both nonmetro and metro areas, married-couple families have much higher median income than do other household types, and non-Hispanic White households have much higher median income than households headed by minorities (table 4-5).

The poverty rate in nonmetro America stood at 15.9 percent in 1997, unchanged from the previous year, and higher than the metro poverty rate of 12.6 percent. The nonmetro poverty rate has been quite stable over the last 10 years, remaining within a

range of 1.7 percentage points (figure 4-2). The nonmetro-metro poverty gap, at 3.3 percentage points, widened for the third consecutive year. The combination of increasing household income with a stagnant poverty rate suggests that nonmetro income growth is more commonly occurring among higher than lower income families.

Nonmetro poverty rates continued to be higher than metro poverty rates across demographic groups (figure 4-3). People living in families headed by women experienced the highest poverty rates of all family types (41.2 percent in nonmetro areas and 34.5 percent in metro), and a high proportion of nonmetro women not living with relatives were also poor (31 percent). Over one-fifth of nonmetro children lived in poor families.

The poverty rates among nonmetro minorities were much higher than those of nonmetro Whites and substantially higher than those of metro minorities. The poverty rate was highest for nonmetro Blacks (31.9 percent), followed by nonmetro Native Americans (31.6 percent) and nonmetro Hispanics (30.7 percent). Despite the higher incidence of poverty among nonmetro minorities, two-thirds of the nonmetro poor were non-Hispanic Whites because of the large White majority in the nonmetro population. However, the Hispanic share of the nonmetro poor has nearly doubled in recent years, growing from 5.8 percent in 1986 to 10.4 percent in 1997.

Table 4-5.

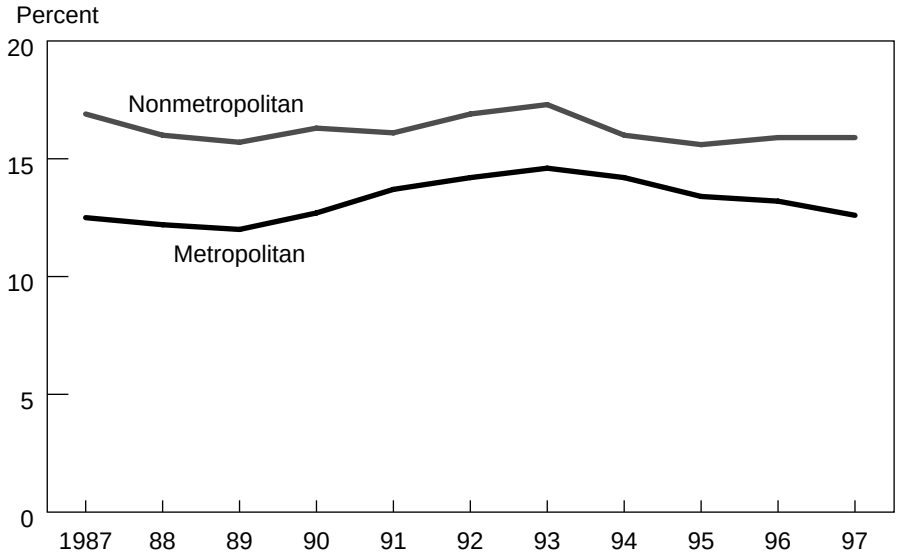
Median household income by family type and race/ethnicity

	Nonmetro	*Metro*	*Nonmetro-Metro gap*[1]
	Dollars		*Percent*
Total	30,057	39,381	23.7
By household type:			
Married-couple family	41,060	55,533	26.1
Female-headed family	18,580	24,304	23.6
Unrelated women[2]	13,310	19,062	30.2
Unrelated men[2]	21,446	30,022	28.6
By race/ethnicity of householder:			
White, non-Hispanic	31,546	43,868	28.1
Black	19,987	25,804	22.5
Hispanic	22,538	27,077	16.8
Native American[3]	21,124	33,653	37.2

[1]Percent by which nonmetro income is lower than metro.
[2]Persons who live alone or with nonrelatives.
[3]The sample of Native Americans is very small, making estimates of their household income subject to high variability.
Source: Prepared by ERS using data from the March 1998 Current Population Survey.

Figure 4-2.

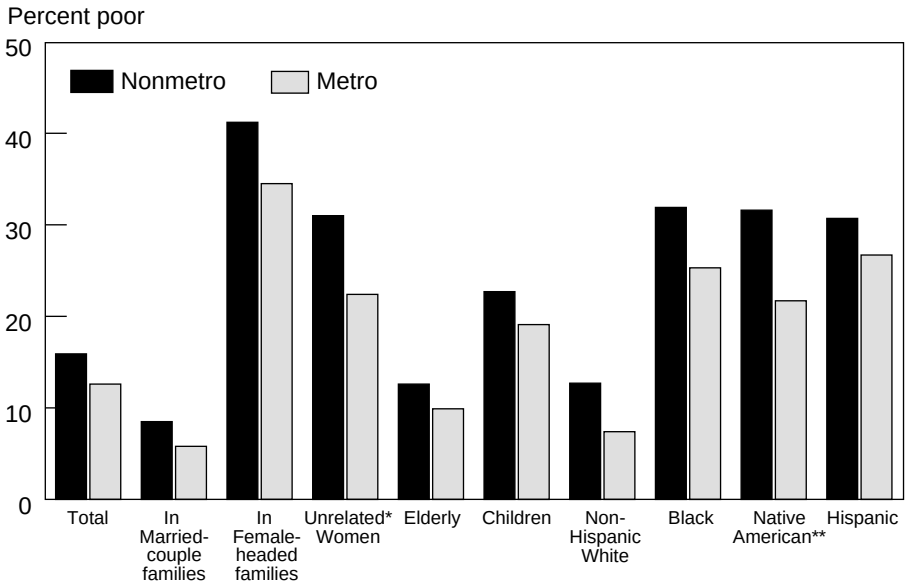
Poverty rate by residence, 1987-97



Source: Prepared by ERS using data from the Bureau of the Census' Consumer Income P-60 series.

Figure 4-3.

Poverty rates by population group, 1997



*Women living alone or with nonrelatives.
**The sample of Native Americans is very small, making estimates of their poverty status subject to high variability.
Source: Prepared by ERS using data from the March 1998 Current Population Survey.

Federal Funding for Rural Area Development

In fiscal year 1997, Federal funds reaching nonmetro counties averaged $4,768 per person, while metro counties averaged $5,333 per person (table 4-6). However, significant regional differences exist. The nonmetro Midwest received the least amount of Federal funds, $4,522 per person, while the nonmetro South and Northeast received slightly higher amounts per person. The nonmetro West received the highest amount of Federal funds, $5,046 per person (table 4-7).

Federal funding includes grants, loans, and other payments to support 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 on the share of Federal funds that can be reliably traced to county levels. Interest on the national debt has been excluded for analytical purposes.

Nonmetro counties received a large share of their funds from income security programs, especially retirement and disability programs. About 42 percent of nonmetro funds were for such programs, compared with 33 percent of the metro funds (table 4-6). The nonmetro West received the highest amounts of per capita grants, salary and wages, and procurement contracts. However, the nonmetro West received only about 37 percent of its Federal funds per person for retirement and disability programs, compared to about 42 percent for the nonmetro Northeast, 43 percent for nonmetro Midwest as well as nonmetro South (table 4-7).

Table 4-6.

Federal funds per capita, FY 1997

Object class of funds	*All counties*	*Metro counties*	*Nonmetro counties*
		Dollars	
All Federal funds, including loans	5,218	5,333	4,768
Salaries and wages	611	675	360
Procurement contracts	646	736	291
Direct payments to individuals	2,868	2,726	2,936
For retirement and disability	1,810	1,762	1,996
Other than retirement & disability	959	964	940
Other direct payments	39	20	117
Grants	721	721	723
Loans	432	455	341
Direct loans	77	52	174
Guaranteed loans	355	403	167
All expenditures, excluding loans	4,885	4,878	4,427

Note: Details may not add due to rounding.
Source: Prepared by the ERS using data from the U.S. Bureau of the Census.

Table 4-7.

Distribution of Federal funds per capita in the nonmetro regions, FY 1997

Object class of funds	*Northeast Region*	*Midwest Region*	*South Region*	*West Region*
		Dollars		
All Federal funds, including loans	4,839	4,522	4,824	5,046
Salaries and wages	433	283	325	566
Procurement contracts	336	185	273	520
Direct payments to individuals	2,983	2,818	3,121	2,613
For retirement and disability	2,027	1,952	2,069	1,853
Other than retirement & disability	956	866	1,052	760
Other direct payments	14	208	81	108
Grants	792	608	753	820
Loans	281	420	271	419
Direct loans	116	275	130	136
Guaranteed loans	165	145	141	283
All expenditures, excluding loans	4,558	4,102	4,553	4,627

Note: Details may not add due to rounding.
Source: Prepared by the ERS using data from the U.S. Bureau of the Census.

5. U.S. Department of Agriculture

USDA is the third-largest civilian Department of the U.S. Government, overseeing a variety of agencies, Government corporations, and other entities that employ more than 95,000 people at over 15,000 locations in all 50 States and 60 countries.

The Department has undergone a historic reorganization to improve coordination among its broad range of programs and agencies. This reorganization, which affects headquarters and field structures, was authorized by the Department of Agriculture Reorganization Act of 1994 (Pub. L. 103-354), signed into law in October 1994.

The reorganization focused the Department's work under the following seven mission areas, which operate over 200 programs. These areas are described in chapters 6-12 of this *Agriculture Fact Book*:

Rural Development
Farm and Foreign Agricultural Services
Food, Nutrition, and Consumer Services
Food Safety
Natural Resources and Environment
Research, Education, and Economics, and
Marketing and Regulatory Programs.

Some organizations serve the entire Department of Agriculture, including all mission areas. Among these are the Assistant Secretary for Administration (Departmental Administration), Office of the Chief Economist, Office of Inspector General, Office of the Chief Financial Officer, Office of the Chief Information Officer, Office of General Counsel, and Office of Communications, all of which report directly to the Secretary of Agriculture. The Office of Congressional and Intergovernmental Affairs serves as liaison between the Department and Members of Congress and their staffs, State and local governments, and Indian tribes and their members.

Departmental Administration

Departmental Administration (DA) provides leadership and guidance to ensure that USDA is managed effectively, efficiently, and fairly in its administrative program and services. The Departmental Administration Staff Offices provide support to policy officials of the Department and overall direction and coordination for the administrative programs and services of the Department. In addition, DA manages the Headquarters Complex and provides direct customer service to Washington, DC, employees.

Office of Civil Rights

The Office of Civil Rights (CR) provides overall leadership, oversight, direction, and coordination for USDA civil rights and equal employment opportunity programs. CR is responsible for promulgating policies that will increase the participation of women, minorities, and persons with disabilities at all levels in the USDA workforce, and ensure equal opportunity in the delivery of USDA programs and services to all customers without regard to race, gender, national origin, disability, and other protected bases. CR works in collaboration with the USDA mission areas in implementing civil rights laws, regulations, and best practices in both employment and agricultural program delivery areas.

In 1999, CR focused on improving civil rights accountability systems within USDA and is developing policies on accountability, reprisal, and disciplinary and corrective actions. CR also issued departmental regulations on compliance reviews for programs conducted and assisted in the processing of civil rights complaints.

In March 1999, a consent decree was signed to settle the civil rights class action brought against USDA by African American farmers from across the country. The claims filed under the class are now being reviewed and settled.

The backlog of program complaints was substantially reduced through the efforts of the Early Resolution Task Force. Of the l,088 backlog cases existing in September 1998, only 2 cases remain. The Statute of Limitations (Section 741 of the Omnibus Bill) Project within CR has the responsibility of reviewing program discrimination complaints filed prior to July 1, 1997.

In July 1999, the Director of Civil Rights appointed a Task Force on Sexual Orientation to update the 1994 Task Force Report and to make recommendations to address issues of sexual orientation.

CR continued to work with agencies to develop training modules in civil rights areas including sexual harassment and disability employment. USDA is exploring new technologies to deliver training to USDA employees throughout the United States.

A strong Civil Rights program supports USDA's goals. The Civil Rights program ensures that customers have full access to all USDA programs and activities, that program and equal employment opportunity complaints are handled fairly and expeditiously, and that the best supervisory and management practices are followed so that a diverse staff of USDA employees are highly productive and effective. The Civil Rights program directly supports three of the Department's management initiatives–civil rights, outreach, and human resource management.

Office of Human Resources Management

The Office of Human Resources Management provides overall direction and leadership for USDA human resources management programs and initiatives. OHRM establishes departmental human resources management policy and represents USDA in governmentwide initiatives. The office develops and administers guidelines, principles, and objectives supporting human resources management, safety

and health management, and labor management partnerships. OHRM provides advice and guidance to USDA mission areas and provides oversight through compliance reviews. This office fully supports the civil rights initiatives of the Department's Office of Civil Rights and provides operational human resources management services for the Office of the Secretary and departmental staff offices.

OHRM manages an employee career management program to assist USDA employees in managing their careers. The program was enhanced in 1998-99 by making available to field employees an on-site 2-day Individual Career Management Workshop. A total of 12 workshop sessions were delivered to field employees at different locations nationwide.

In addition, OHRM administers the Summer Intern Program and 14 other student internships, which employed a total of 5,334 students in 1999. This is an increase of more than 26 percent from the prior year. Of the students employed, 16.8 percent were African American; 10.4 percent, Hispanic; 4.0 percent, Asian; and 3.1 percent, American Indian or Alaska Native. Also included in this group were 35 students with disabilities.

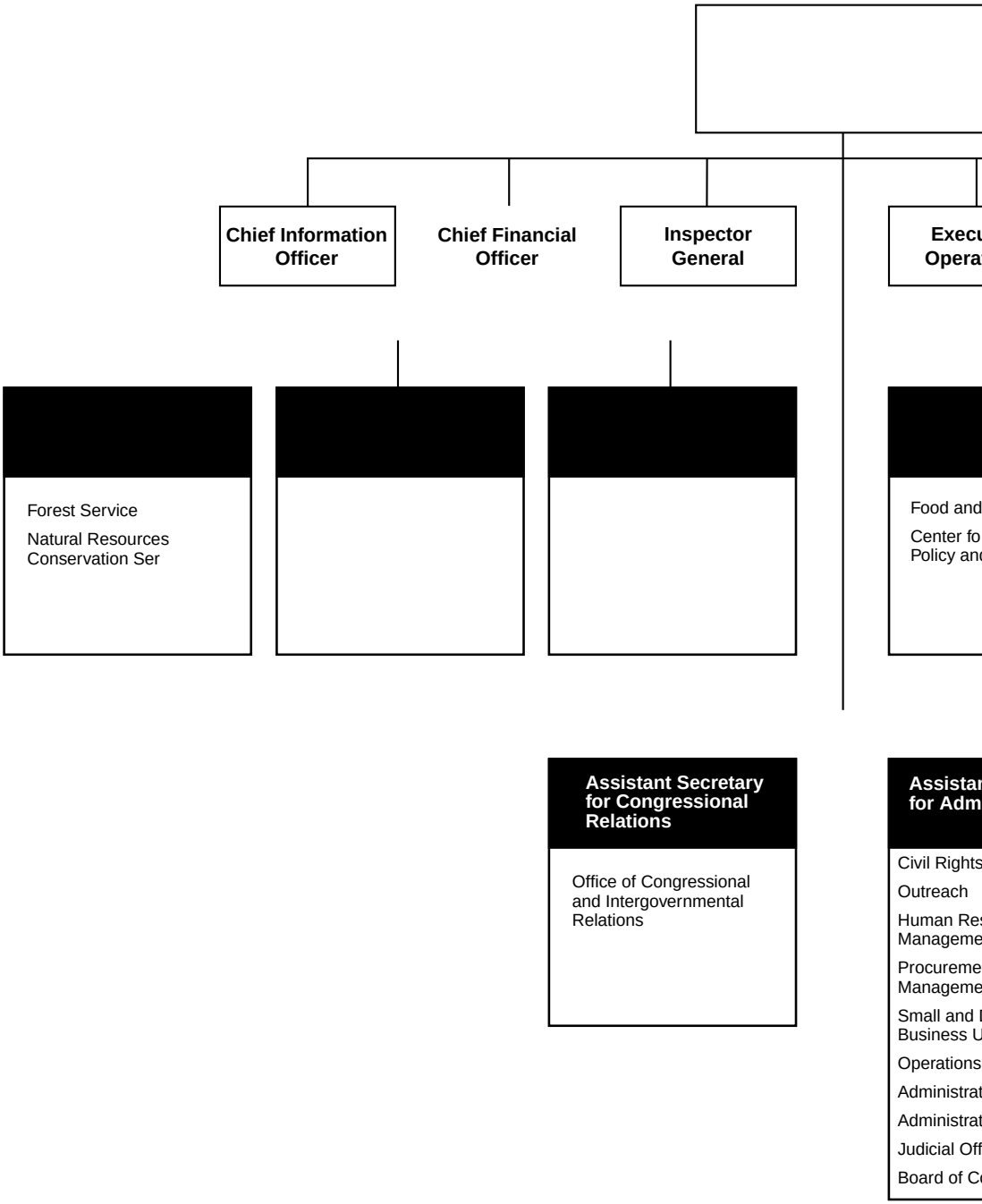
Office of Procurement, Property, and Emergency Preparedness

The Office of Procurement, Property, and Emergency Preparedness (OPPEP) provides leadership and policy guidance concerning procurement, property management, energy conservation, disaster management, and coordination of emergency programs. OPPEP also promotes and establishes USDA policy for alternative fuel vehicles, and the purchase of biobased, environmentally preferable, and recycled products.

OPPEP is working to simplify and reduce the cost of procurement, and to improve access to information about procurement and property management policy for businesses and other members of the public. The cost of procurement has been reduced by expanding the use of commercial credit cards (purchase cards) and the Purchase Card Management System to make small purchases. At the end of FY 1998, over 19,000 purchase cards had been issued to qualified holders throughout USDA. OPPEP also introduced a Fleet Card Program so that cardholders may purchase fuel and service for government vehicles. Over 42,000 fleet cards were issued in FY 1998. OPPEP posts USDA procurement and property management policy and procedures on the Departmental Administration web site (*www.usda.gov/da.html*). Businesses interested in selling to USDA can view "Doing Business with USDA" at the web site. OPPEP also posts information about disaster relief at this web site.

In October 1998, USDA published in the Federal Register *Uniform Procedures for the Acquisition and Transfer of Excess Personal Property*, in accordance with the provisions of Section 923 of the Federal Agriculture Improvement and Reform Act of 1996. As of June 1999, OPPEP transferred excess personal property worth $2.1 million to 1994 institutions (tribal), 1890 institutions, and Hispanic-serving institutions.

U.S. Department of Agriculture Headquarters Organization



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Director of Communications

General Counsel

Nutrition Sevice

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Food Safety and Inspection Service

Agricultural Research Service

Cooperative State Research, Education and Extension Service

Economic Research Service

National Agricultural Statistics Service

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Agricultural Marketing Service

Animal and Plant Health Inspection Service

Grain Inspection, Packers and Stockyards Administration

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November 1998

Table 5-1.

Number of USDA employees, 1948-99

Year	Number of USDA employees	Year	Number of USDA employees[1]
1948	60,815	1974	101,430
1949	63,063	1975	103,779
1950	67,560	1976	109,276
1951	66,150	1977	113,085
1952	62,825	1978	118,563
1953	62,492	1979	122,809
1954	63,309	1980	125,185
1955	64,191	1981	117,440
1956	69,423	1982	111,853
1957	74,215	1983	109,773
1958	77,264	1984	108,598
1959	79,998	1985	106,665
1960	81,585	1986	102,997
1961	85,238	1987	102,579
1962	89,168	1988	106,552
1963	94,527	1989	109,567
1964	94,781	1990	110,754
1965	94,548	1991	110,357
1966	98,688	1992	113,405
1967	102,175	1993	112,458
1968	105,628	1994	109,830
1969	101,848	1995	103,848
1970	100,860	1996	100,710
1971	102,698	1997	98,457
1972	104,540	1998	96,410
1973	104,104	1999	95,491

[1]Full-time equivalent (FTE). For example, two half-time employees would count as one FTE.

Table 5-2.

Where do USDA employees work?

State	*Number of employees**	*State*	*Number of employees**
Alabama	1,140	Montana	2,566
Alaska	851	Nebraska	1,391
Arizona	1,605	Nevada	328
Arkansas	1,815	New Hampshire	279
California	7,162	New Jersey	518
Colorado	2,531	New Mexico	1,357
Connecticut	157	New York	1,067
Delaware	208	North Carolina	1,790
District of Columbia	6,559	North Dakota	750
Florida	1,629	Ohio	810
Georgia	2,357	Oklahoma	900
Hawaii	429	Oregon	4,589
Idaho	2,524	Pennsylvania	1,444
Illinois	1,513	Rhode Island	32
Indiana	733	South Carolina	875
Iowa	1,840	South Dakota	816
Kansas	1,068	Tennessee	1,009
Kentucky	1,085	Texas	3,464
Louisiana	2,867	Utah	1,438
Maine	240	Vermont	229
Maryland	3,008	Virginia	1,977
Massachusetts	336	Washington	2,256
Michigan	1,105	West Virginia	659
Minnesota	1,600	Wisconsin	1,423
Mississippi	1,881	Wyoming	695
Missouri	3,905		

Territory	*Number of employees**	*Territory*	*Number of employees**
American Samoa	6	Marshall Islands	1
Commonwealth of Northern Mariana Islands	5	Puerto Rico	561
Guam	33	Trust Territories of the Pacific	1
		U.S. Virgin Islands	25

Table 5-2.

Where do USDA employees work? (continued)

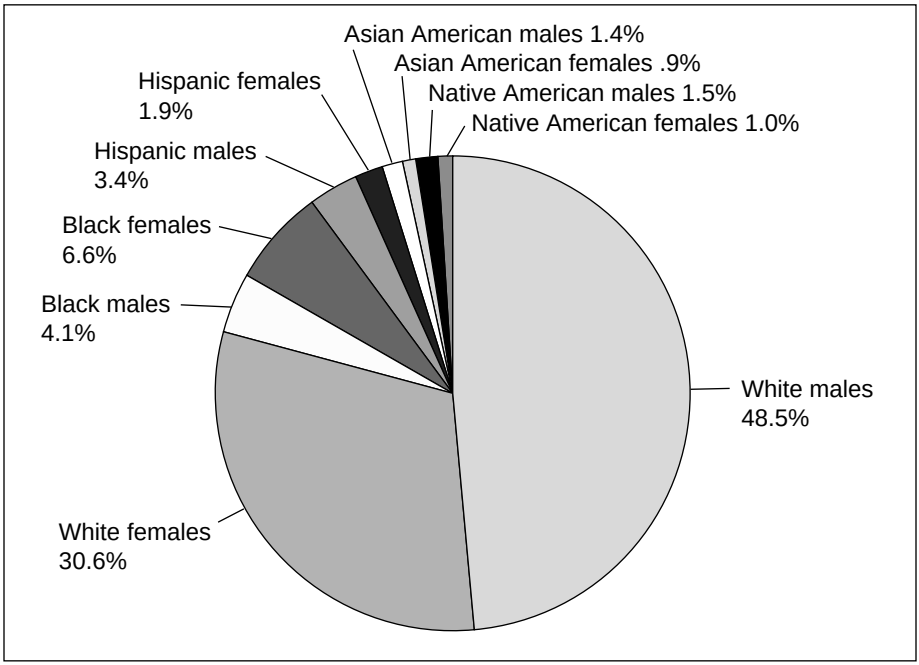
Country	*Number of employees**	*Country*	*Number of employees**
Argentina	3	Malaysia	1
Australia	3	Mexico	17
Austria	6	Morocco	1
Bahamas	1	Netherlands	3
Belgium	6	New Zealand	1
Bermuda	1	Nicaragua	2
Brazil	5	Nigeria	1
Bulgaria	1	Pakistan	1
Canada	3	Panama	8
Chile	3	Peru	1
China	7	Philippines	2
Columbia	1	Poland	2
Costa Rica	4	Republic of Korea	2
Dominican Republic	2	Republic of Palau	3
Egypt	2	Russia	6
Ethiopia	1	Saudi Arabia	1
Federated States of Micronesia	10	Singapore	1
France	7	South Africa	2
Germany	4	Spain	2
Guatemala	5	Sweden	1
Haiti	1	Switzerland	5
Hong Kong	2	Thailand	2
India	1	Turkey	2
Indonesia	2	Ukraine	1
Italy	4	United Arab Emirates	1
Ivory Coast	1	United Kingdom	2
Jamaica	2	Venezuela	3
Japan	10	Vietnam	1
Kenya	2		

*Permanent, full-time employees.

■ *In 1999, USDA had nearly 1,000 employees with targeted disabilities in permanent full-time positions.*

Figure 5-1.

USDA workplace profile by race and gender group, 1999



Office of Operations

Mail

Smokey Bear receives more mail than any individual in the Department. Each year, USDA receives over 180 million pieces of mail, and at the Washington, DC, headquarters alone, over 21 million pieces of mail are handled each year—for an average of about 84,000 pieces of mail processed each workday.

The headquarters mail operation is an active employer of people with disabilities. Over one-third of its employees are people with disabilities. Working closely with private and public placement organizations, the division has succeeded in bringing these employees into the work force. In recognition of its success in hiring the disabled, the division has received numerous government and private-sector awards.

The mail center is one of USDA's reinvention laboratories supporting Vice President Gore's National Performance Review, in which the Department has taken an active role. One advance is the implementation of computer-assisted mail sorting systems, which will improve efficiency and reduce by at least five the number of employees needed for this staff. Also, USDA is taking the lead in developing governmentwide mail management initiatives that are projected to save over $2 million.

Washington Area Strategic Space Plan

The Office of Operations continues to work on the Strategic Space Plan which is designed to provide modern, safe, and efficient office space for USDA employees in the Washington, DC, metropolitan area. The George Washington Carver Center in Beltsville, Maryland, was completed last year. This 350,000-square-foot modern office complex provides space for over 1,100 employees. Much of the day-to-day building operation is done by Mellwood, a community rehabilitation, nonprofit organization that provides employment opportunities for persons with severe disabilities.

The George Washington Carver Center includes a telework center. The center will provide 31 work stations for USDA employees under the flexiplace concept or for short-term (3 months or less) task forces involving employees who are on temporary duty assignments in the metro area.

In addition, the first phase of the modernization of the 1.3 million-square-foot USDA South Building is well underway. This nearly 70-year-old building is much in need of renovation. When finished, this project coupled with the George Washington Carver Center will enable USDA agencies in the metro area to move out of more expensive leased space into modern and efficient USDA-managed space.

Print on Demand

The Office of Operations' Consolidated Forms and Publications Distribution Center (CFPDC) and the Mail and Reproduction Division are currently offering Print on Demand services to all user agencies.

Print on Demand is state-of-the-art technology and the wave of the future in modern warehousing and forms management programs. Substantial cost savings in printing and storage costs can be accrued to agencies by utilizing this service. Cut sheets, non-carbon and double-sided forms, pamphlets, and many other printed items no longer need to be stored for future use. Instead, these items are scanned or otherwise inputed onto small optical storage discs, and then hard copies are produced as needed and only in the quantity needed to fill a specific order.

To date, CFPDC has reduced its cut-sheet inventory items by over 10 percent and anticipates that Print on Demand technology will enable further reductions of 20 to 30 percent.

Computers for Learning

The Office of Operations' Centralized Excess Property Operation (CEPO) is an active participant in Vice President Gore's Computers for Learning Initiative. CEPO collects excess/surplus computer equipment from USDA and 17 other Federal agencies in the Washington metropolitan area. Initially, the equipment is offered for reuse by other agricultural agencies. Computer equipment not needed by agencies is tested and, if possible, repaired.

Office of Small and Disadvantaged Business Utilization

The Office of Small and Disadvantaged Business Utilization (OSDBU) provides departmentwide leadership and oversight for implementing and executing Small Business Programs prescribed under Sections 8 and 15 of the Small Business Act of 1958, as amended. It also has implementation responsibilities for Executive Order

(E.O.) 12432, Minority Business Enterprise Development, and E.O. 12138, Women-Owned Business Enterprise Development.

OSDBU develops policy to enhance the utilization of small, minority, and women-owned small businesses in the contract and program opportunities of USDA. It analyzes procurement trends and develops initiatives to improve contract awards to small, minority, and women-owned small businesses. It provides outreach to raise awareness and solicit small business interest in USDA programs, and it monitors and reports the percentage of contract awards by USDA to small, minority, and women-owned businesses.

OSDBU's goal is to provide information, guidance, and technical assistance to ensure continuous growth in the rate of small business participation in USDA programs and procurements.

If you are interested in business opportunities with the Department of Agriculture, visit our web site at *www.usda.gov/da/smallbus.html* or call (202) 720-7117 for more details.

Office of Ethics

The Office of Ethics was created in 1998 to direct and coordinate the ethics programs within the various mission areas of the Department and to service headquarters staff directly. The Office develops departmentwide policies and regulations; provides training to USDA staff on the various rules governing employee conduct, conflicts of interest, and political activity; administers personal financial disclosure reporting by senior staff; and counsels employees on these matters. Over the past year, the Office has invested heavily in Internet technology to provide online training modules for USDA staff stationed all over the world, and was the first Federal agency to offer disclosure reporting through a secure online, web-based system. In addition to USDA staff, employees from other Federal agencies and the public have accessed the ethics web site located at *www.usda.gov/ethics*

Office of Outreach

The Office of Outreach provides overall leadership and coordination to assure that all potential customers have full access to all USDA programs and services. In conjunction with other USDA agencies, special emphasis is directed toward underserved populations. The Office administers the Outreach for Socially Disadvantaged Farmers Program, authorized by Section 2501 of the Food, Agriculture, Conservation, and Trade Act of 1990.

Office of the Chief Economist

The Office of the Chief Economist advises the Secretary of Agriculture on policies and programs affecting U.S. agriculture and rural areas. This advice includes assessments of USDA program proposals, legislative proposals, and economic developments of importance to agriculture and rural areas. In addition, the Office of the Chief Economist is responsible for several programs, described below, that coordinate activities across USDA agencies.

The World Wide Web address for the Office of the Chief Economist is *http://www.usda.gov/oce/*

World Agricultural Outlook Board

The World Agricultural Outlook Board is USDA's focal point for forecasts and projections of global commodity markets. Each month the Board brings together interagency committees of experts to forecast the supply, use, and prices of major commodities in the United States and abroad. The committees also clear agricultural forecasts published by other USDA agencies. This teamwork ensures that USDA forecasts are objective and consistent.

Because the weather is vital to crop forecasts, specialists from the Board work side by side with weather forecasters from the National Oceanic and Atmospheric Administration to monitor the weather and assess its effect on crops. Their work provides timely information on potential changes in global production.

The Board also coordinates departmentwide activity on long-term economic projections, remote sensing, and climate. The Department is one of the largest users of remote sensing in the Federal Government. The Board coordinates remote sensing activities at USDA and chairs the Department's Remote Sensing Coordination Committee. The Board also hosts the Department's Chief Meteorologist, who serves as the principle spokesperson on weather and climate issues and chairs a departmental weather and climate coordinating committee.

The World Wide Web address for the World Agricultural Outlook Board is *http://www.usda.gov/oce/waob/index.htm*

Office of Risk Assessment and Cost-Benefit Analysis

This office is responsible for coordinating, reviewing, and approving all risk assessments and cost-benefit analyses of mitigation measures associated with major regulations of the Department. Major regulations are economically significant (with an impact of at least $100 million each year) and have a primary effect on human health, human safety, or the environment. The office provides direction to USDA agencies on appropriate methods for these analyses and serves as a focal point on matters relating to risk assessment in interagency reviews.

The World Wide Web address for the Office of Risk Assessment and Cost-Benefit Analysis is *http://www.usda.gov/oce/oracba/index.htm*

Agricultural Labor Affairs

The coordinator of agricultural labor affairs is responsible for coordinating USDA's agricultural labor policy. Areas of concern include immigration, the H-2A Temporary Agricultural Worker Program, worker protection standards for pesticide use, farm labor supply, and agricultural employment issues.

The World Wide Web address for this office is *http://www.usda.gov/oce/oce/labor-affairs/affairs.htm*

Sustainable Development

OCE's director of sustainable development works to integrate the principals of sustainable development into the Department's policies and programs, ensuring that economic, social, and environmental considerations are balanced in decisionmaking. The director also directs and coordinates the Department's domestic and international policies and programs in sustainable development, including sustainable agriculture, forestry, and rural communities.

The World Wide Web address for this office is *http://www.usda.gov/oce/osfsd/index.htm*

Global Change Program Office

Global climate change, whether from natural causes or human activity, could have important consequences for farming, forestry, and rural areas. The Global Change Program Office functions as the USDA-wide coordinator of global change program and policy issues facing the Department. The Office coordinates activities with other agencies, interacts with the legislative branch on climate change issues, and represents USDA in international climate change discussions. It also is a source of objective assessment of the economic effects of climate change and proposed mitigation strategies on agriculture and forestry.

The World Wide Web address for this office is *http://www.usda.gov/oce/oce/gcpo/index.htm*

Office of Energy Policy and New Uses

The Office of Energy Policy and New Uses assists with development of departmental energy policy and coordination of departmental energy programs and strategies. The Office provides economic analysis on energy policy issues, coordinates USDA energy-related activities within and outside the Department, and studies the feasibility of new uses of agricultural products.

The World Wide Web address for this office is *http://www.usda.gov/oce/oepnu/index.htm*

Office of Inspector General

USDA's Office of Inspector General (OIG), the first civilian OIG in the Federal Government, was established in 1962 and became fully operational in 1963. OIG conducts and supervises audits and evaluations, as well as investigations and law enforcement efforts relating to USDA's programs and operations. It provides leadership and coordination and recommends policies for activities that will prevent and detect fraud and abuse and promote economy, efficiency, and effectiveness in USDA programs and operations. Furthermore, OIG keeps the Secretary and Congress fully informed of problems and deficiencies related to administration of USDA programs and operations, and of the actions designed to correct such problems and deficiencies.

During fiscal year 1999, audit and investigative efforts resulted in approximately $262 million in questioned costs and $68 million in fines, restitutions, other recoveries, and penalties. Management agreed to put an additional $114 million to better use and recover more than $55 million. Investigative efforts resulted in 782 indictments and 560 convictions.

OIG continued work on three Presidential initiatives to improve the efficiency of three USDA programs. A nationwide cooperative effort by OIG and the Rural Housing Service identified over $4.3 million in misused funds at Rural Rental Housing apartment complexes operated by 20 owners and management agents; 10 cases are under investigation. Schemes included double-charging apartment complexes for management-related expenses and charging apartment complexes for personal expenses of the owner or management agent. In addition, 145 apartment complexes had serious physical deterioration, 215 needed minor repairs, and 50 had conditions that posed a health and safety hazard to tenants.

Operation "Kiddie Care" is still finding a high level of fraud in the Child and Adult Care Food Program (CACFP). The 22 sponsoring organizations terminated from the program had been receiving $45.4 million in program funds annually. In 1 Ohio case, 11 persons have been implicated in a conspiracy to illegally obtain more than $1.1 million in CACFP funds. Nine of the individuals have been indicted, and seven have pled guilty and have been sentenced to as much as 2 years 9 months of incarceration and restitution of $790,000.

Operation Talon was designed and implemented by OIG to locate and apprehend fugitives, many of them violent offenders, who are current or former food stamp recipients, and was made possible by legislative changes in welfare reform. This nationwide initiative has been expanded to include a total of 42 metropolitan areas in 23 States, and the total number of arrests through Operation Talon has climbed to about 5,600, as a result of joint OIG/State and local law enforcement operations. The fugitives arrested during Operation Talon have included dangerous felons wanted for murder, child molestation, rape, and kidnapping, and over one-third of those arrested were sought in connection with violent crimes or illegal drug activity.

Office of the Chief Information Officer

The Chief Information Officer is the Department's senior information technology official. The Office of the Chief Information Officer (OCIO) supports program delivery in USDA by planning, directing, and coordinating the Department's information and technology resources.

In accordance with the Clinger-Cohen Act of 1996 and similar legislation, regulations, and executive orders, OCIO provides long-range-planning guidance, reviews all major technology investments to ensure that they are economical and effective, coordinates interagency Information Resources Management projects, and promotes information exchange and technical interoperability.

OCIO also provides telecommunications and automated data processing (ADP) services to USDA agencies through its Telecommunications Services and Operations

and National Information Technology Center located in Ft. Collins, Colorado; Kansas City, Missouri; and Washington, DC. Direct ADP services are provided to the Office of the Secretary, Office of the General Counsel, Office of Communications, Office of the Chief Financial Officer, and Executive Operations.

OCIO has oversight responsibilities for the Service Center Modernization Initiative (SCMI), which is the cornerstone of the overall reorganization and modernization effort of the Department. The ultimate goal of the SCMI is to create an environment of one-stop, quality service for customers of the Farm Service Agency, the Natural Resources Conservation Service, and the Rural Development mission area agencies.

Office of the Chief Financial Officer

The Chief Financial Officer has responsibility for oversight of all financial management activities relating to USDA programs and operations. The Office of the Chief Financial Officer (OCFO) directs, manages, provides policy guidance, and coordinates financial management activities and operations. It ensures compliance throughout the Department with applicable accounting standards and principles, and ensures adequate controls over asset management, including cash management operations, real property, equipment, and inventories. Through partnerships, it provides financial management leadership and service to support quality program delivery in the Department.

OCFO is responsible for developing and maintaining an integrated departmental accounting and financial management system which provides complete, reliable, consistent, and timely financial information that is responsive to the needs of program managers. OCFO is also responsible for ensuring auditable financial statements.

OCFO operates the largest automated administrative servicing operation in the Federal Government—the National Finance Center (NFC) in New Orleans, LA. The NFC processes salary and benefit payments for nearly 450,000 Federal employees, performs administrative services for more than 100 Federal departments and agencies, and acts as recordkeeper for the Federal Government's Thrift Savings Plan (TSP). The TSP currently services an $88 billion account for 2.5 million Federal employees and retiree members.

Office of Congressional and Intergovernmental Relations

Office of Congressional Relations

USDA's Office of Congressional Relations serves as the Department's primary liaison with Members of Congress and their staffs, providing information on the Department's legislative agenda, budget proposals, programs, and policies.

Office of Intergovernmental Affairs

The Office of Intergovernmental Affairs (OIA) works closely with the Nation's Governors and State Commissioners of Agriculture, and other State and local elected officials, on various issues relating to their States. OIA is responsible for disseminating information on programs involving the implementation of USDA policies and procedures applicable to the Department's intergovernmental relations.

OIA participates with the Secretary, Deputy Secretary, and the Assistant Secretary for Congressional Relations in the overall planning, formulation, and direction of the activities of the office relating to intergovernmental affairs. OIA serves as the USDA liaison with the White House and other executive branch agencies and departments with respect to intergovernmental affairs.

American Indian and Alaska Native Programs

The Director of Native American Programs, located in the Office of Intergovernmental Affairs, is USDA's primary contact with tribal governments and their members. The director serves as the principal adviser and representative on all matters related to USDA policy and programs which affect and are available to American Indians and Alaska Natives. The director also chairs USDA's Native American Working Group, which reports to the Secretary and provides advice, support, and other assistance to the director. In 1992, USDA adopted an American Indian and Alaska Native policy which guides USDA's interactions with Indian tribes.

USDA provides a wide range of programs and services in all mission areas to American Indian and Alaska Native communities. In recent years, the Department has reached out to inform American Indians and Alaska Natives about USDA programs and services available to them, to deliver programs more effectively to Indian tribes, and to initiate new programs in response to the needs of Indian tribes. In October 1997, USDA published a *Guide to USDA Programs for American Indians and Alaska Natives* to improve tribal communities' access to USDA programs. The guide is also available on the USDA home page at the following address: *www.usda.gov/news/pubs/indians/open.htm*

National Appeals Division

The National Appeals Division was established in 1994 to conduct impartial administrative appeal hearings and reviews of adverse program decisions made by officers, employees, or committees of designated agencies of the Department of Agriculture.

The World Wide Web address for the division is: *www.nad.usda.gov*

The USDA Community Food Security Initiative

The USDA Community Food Security Initiative is seeking to cut hunger in America in half by the year 2015. This initiative is creating and expanding grass-roots partnerships that build local food systems and reduce hunger. USDA is joining with States, municipalities, nonprofit groups, and the private sector to strengthen local food systems by replicating best practices of existing efforts and by catalyzing new community commitments to fight hunger.

Goals

Create new and enhance existing local infrastructures to reduce hunger and food insecurity.

Increase economic and job security by helping low-income people to obtain living wage jobs and attain self-sufficiency.

Bolster food and nutrition assistance by strengthening the Federal nutritional safety net and by increasing the amount of supplemental foods provided by nonprofit groups.

Improve community food production and marketing by aiding projects that grow, process, and distribute food locally.

Boost education and awareness by increasing efforts to inform the public about nutrition, food safety, and food security.

Improve research, monitoring, and evaluation efforts to help communities assess and strengthen food security.

Methods

Catalyze the development of new partnerships on the local, State, and Federal levels to help communities reduce hunger.

Improve the coordination between existing USDA programs–such as nutrition assistance programs, community food grants, ongoing research, farmers' markets, and food recovery projects–and related Federal, State, and community initiatives.

Expand technical assistance to States, communities, and nonprofit groups to build long-term local structures to increase food security.

Increase public awareness of the causes of food insecurity and highlight innovative community solutions to hunger.

For More Information

Departmental Administration

Freedom of Info Act Liaison
Evelyn M. Davis
Rm 0612-S
Washington, DC 20250
202-720-7765
FAX 202-690-4728

Civil Rights Freedom of Information
M. Farook Sait
Rm 334-W
Washington, DC 20250
202-720-7569
FAX 202-205-2891

National Appeals Division

Freedom of Info Act Officer
Larry Shrum
Park Office Center
Rm 1113
Alexandria, VA 22302
703-305-1164
FAX 703-305-2825
lshrum@usda.gov

Office of Budget and Program Analysis

Freedom of Info Act Officer
Jacquelyn Chandler
Rm 118-E
Washington, DC 20250
202-720-1272
FAX 202-690-3673
jyc@obpa.usda.gov

Office of the Chief Economist

Public Information Officer
Raymond L. Bridge
Rm 5143-S
Washington, DC 20250-3812
202-720-5447
FAX 202-690-1805
rbridge@oce.usda.gov

Agricultural Labor Affairs
Al French
Rm 112-A
Washington, DC 20250-3810
202-720-4737
FAX 202-690-4915
al.french@usda.gov

World Agricultural Outlook Board
Public Information Officer
Raymond L. Bridge
Rm 5143-S
Washington, DC 20250-3812
202-720-5447
FAX 202-690-1805
rbridge@oce.usda.gov

Chief Meteorologist
(Vacant)
Rm 5143-S
Washington, DC 20250-3812
202-720-8651
FAX 202-720-4043

Office of Risk Assessment and Cost-Benefit Analysis
Alwynelle (Nell) Ahl
Rm 5248-S
Washington, D.C. 20250-3811
202-720-8022
FAX 202-720-1815
aahl@oce.usda.gov

Global Change Program Office
Jim Hrubovcak
Rm 112-A
Washington, DC 20250-3814
202-720-6699
FAX 202-401-1176
jhrubovcak@oce.usda.gov

Sustainable Development
Adela Backiel
Rm 112-A
Washington, DC 20250-3810
202-720-2456
FAX 202-690-4915
adela.backiel@usda.gov

Office of Energy Policy and New Uses
James Duffield
Rm 112-A
Washington, DC 20250-3815
202-401-0523
FAX 202-401-0533
jduffield@oce.usda.gov

Office of Chief Financial Officer

Freedom of Info Act Officer
Gary Barber
Rm 4088-S
Washington, DC 20250
202-720-1221
FAX 202-690-2568
gbarber@usda.cfo.gov

Office of Chief Information Officer

Freedom of Info Act Officer
Howard Baker
Rm 404-W
Washington, DC 20250
202-720-8657
FAX 202-205-2831
howard.baker@usda.gov

Office of the General Counsel

Freedom of Info Act Attorney
Kenneth Cohen
Rm 1547-S
Washington, DC 20250
202-720-5565
FAX 202-720-5837

Office of Inspector General

Director, Info Mgmt Div
Sharon Friend
Rm 9-E
Washington, DC 20250-2309
202-720-6915
FAX 202-690-6305
sjfriend@oig.usda.gov

Chief, Policy Dev & Info
Nancy Bartel
Rm 9-E
Washington, DC 20250-2309
202-720-5677
FAX 202-690-6305
nabartel@oig.usda.gov

Freedom of Info Act Officer
Carol Martin
Rm 29-E
Washington, DC 20250-2309
202-720-5677
FAX 202-690-6305
cjmartin@oig.usda.gov

USDA Community Food Security Initiative

Coordinator
Joel Berg
Washington, DC 20250
202-720-5746 Rm 536-A
FAX 202-690-1131
joel.berg@usda.gov

6. Rural Development: Creating Opportunity for Rural Americans

Helping the people of rural America develop sustainable communities and improve their quality of life is the goal of USDA's Rural Development mission area. USDA believes rural Americans have a right to the same quality of life as is enjoyed by people who live in suburban and urban areas.

USDA Rural Development is working to eliminate substandard housing from rural America by helping rural people buy, build, repair, or rent decent housing. It also creates jobs by providing funding and technical assistance to support the growth and creation of rural businesses and cooperatives. In a typical year, Rural Development programs create or preserve more than 150,000 rural jobs, enable 60,000 to 70,000 rural Americans to buy homes, and help over 450,000 low-income rural people rent apartments or other housing.

Other Rural Development programs help rural communities build or improve community facilities, such as schools, health clinics and fire stations. Rural Development also has programs that help rural communities build or extend utilities, including water, electricity, and telecommunications services.

Program assistance is provided in many ways, including direct or guaranteed loans, grants, technical assistance, research and educational materials. To accomplish its mission, USDA Rural Development often works in partnership with State, local, and tribal governments, as well as rural businesses, cooperatives, and nonprofit agencies.

USDA Rural Development programs are delivered through its three agencies: Rural Utilities Service (RUS), Rural Housing Service (RHS), and Rural Business-Cooperative Service (RBS). RUS addresses rural America's need for basic services such as clean running water, sewers and waste disposal, electricity, and telecommunications. RHS addresses rural America's need for single-family and multi-family housing as well as health facilities, fire and police stations, and other community facilities. RBS provides help to rural areas that need to develop new job opportunities, allowing businesses and cooperatives to remain viable in a changing economy. The Office of Community Development, a branch of Rural Development, is working with these three agencies to improve the economy and living conditions in the Nation's rural Empowerment Zones and Enterprise Communities.

In addition, the Federal Government is seeking to form partnerships with other entities— such as State, local, and tribal governments; private and nonprofit organizations; and member- owned cooperatives—to revitalize rural areas. Rural Development programs are provided across the Nation through 47 State offices and 800 field offices.

How Rural Development Works

The following examples illustrate how USDA Rural Development is working to serve rural citizens and bolster the quality of life in rural communities:

- Earth Day, April 22, 1999. Secretary of Agriculture Dan Glickman announced investments of over $150 million of USDA funds to improve 82 water systems in 44 States and Puerto Rico. **USDA Rural Development Water and Wastewater Program** funds were leveraged with funds from other sources in excess of $50 million for an effort totaling over $200 million.

  As part of this national initiative, in Lapel, IN, Rural Development made a $2.76 million low-interest loan to make major wastewater system improvements. The check was presented at an Earth Day celebration at the local elementary school. Upon receipt of the check, the 500 school kids sang "Happy Birthday to You Dear Earth," and "We Have the Whole World in our Hands."

  The Rural Development funds are making infrastructure improvements in two phases. In the first phase, existing sewer lines will be rehabilitated, new lines will be built, and some existing sewer lines will be converted to storm water lines. This will eliminate the leakage of ground water into the sewer system that overwhelms the treatment plant. Nearly 800 users in Lapel will benefit by this community project. The day's events were organized around the theme of "Get the Eeek Out of Stoney Creek," referring to the fact that there have been health concerns due to the high bacteria levels measured in nearby Stoney Creek.

  Since 1940, USDA programs have loaned over $15 billion for safe drinking water and sanitary sewer systems in rural America. The loan program boasts a loan payback rate of 99.9 percent.

- Rural Development presented a $75,000 check to the directors of the Irondale Citizens Fire Group, Inc., in Missouri. This **Community Facilities Program** funding presented a loan to the not-for-profit corporation in the amount of $55,000 and a grant of $20,000.

  The loan funds were used to purchase a pumper tanker truck and the grant funds will be used to upgrade and replace fire fighting equipment for the firefighters of the Irondale Fire Protection District. Outdated communication equipment will also be replaced with state-of-the-art equipment.

  When the fire district was formed in 1996, its directors immediately began working to improve the fire fighting equipment, hoping to reduce the district's fire insurance rates. The ultimate goal is to improve the effectiveness of the fire district and provide quality fire protection for citizens.

- The loss of businesses has forced many local communities to diversify their economies and encourage existing small businesses to expand and create new employment opportunities. In Ironwood, MI, a community of approximately 7,500 residents, Extreme Tool and Engineering, Inc., is an example of a company that has greatly benefited from **USDA's Rural Development Business and Industry Guarantee Loan Program**. Global Tool and Engineering,

Inc., Extreme Tool's predecessor, was on the brink of closing its Ironwood operations.

For its employees, the loss of employment would force the skilled workers to relocate in order to support their families. Knowing they had the expertise and ability to be competitive in the world marketplace, four of its employees purchased the facility from the parent company and created Extreme Tool and Engineering, Inc. Since purchasing the company, they have been able to diversity and expand their customer base and product line. With the assistance of their lender and USDA Rural Development, they have successfully established themselves in a competitive market and saved jobs, as well as added new jobs, in an area desperately in need of them.

The following overviews describe the three Rural Development agencies and their main programs.

Rural Business-Cooperative Service

Creation of viable new and improved businesses and cooperatives in rural America is the top priority of the Rural Business-Cooperative Service (RBS). This agency works through partnerships with public and private community-based organizations to provide financial assistance, business planning, and technical assistance to rural businesses. It also conducts research into rural economic issues, including rural cooperatives, and provides educational material to the public.

Business and Industry (B&I) Loan Guarantees help to finance rural business and industry projects that create employment opportunities and improve the economic and environmental climate in rural communities, including pollution abatement and control. Loan guarantees are made for projects that foster sustained community benefits and open private credit markets. Priority for B&I loan guarantees is given to applications for loans from rural areas or cities of 25,000 or less, with loans limited to areas that are not located within the outer boundary of a city having a population of 50,000 or more and the immediately adjacent urbanized area. Loans are limited to $25 million for any one borrower.

Under the B&I Guaranteed Loan Program, the **Cooperative Stock Purchase Authority** provides financial assistance for the purchase of startup cooperative stock for family-sized farms where the commodities are produced to be processed by the cooperative.

Direct Business and Industry (B&I) Loans are made to public, private, and cooperative organizations, Indian tribes or tribal groups, corporate entities, or individuals to finance businesses within economically deprived communities. The program provides economic stimulus which helps rural areas in greatest need.

Intermediary Relending Program Loans finance business facilities and community development projects in rural areas, including cities of less than 25,000. Loans to intermediaries support the establishment of new business facilities and community development projects in rural areas.

Rural Economic Development Loans and Grants promote rural economic development and job creation projects, including feasibility studies, startup costs, and other reasonable project expenses. The maximum amount of a grant is $330,000 while the maximum amount of a loan is $450,000. Loans have a maximum term of 10 years and are repaid without interest. These loans and grants are available to existing RUS electric and telecommunications borrowers.

Rural Business Enterprise Grants help public bodies, nonprofit corporations, and federally recognized Indian tribal groups finance and develop small and emerging private business enterprises located in rural areas. Grants may be used to acquire and develop land and to construct buildings, plants, equipment, access streets and roads, parking areas, and utility and service extensions. In addition, funds may be used for refinancing, fees for professional services, technical assistance, startup costs and working capital, financial assistance to a third party, production of television programs targeted to rural residents, and rural distance-learning networks.

Rural Cooperative Development Grants finance the establishment and operation of centers for cooperative development. The program enhances the economy of rural areas by developing new cooperatives and fostering improved operations for existing co-ops.

The **Appropriate Technology Transfer for Rural Areas** program provides information to farmers and other rural users on a variety of sustainable agricultural practices, including crop and livestock operations. It helps agriculture by giving reliable, practical information on production techniques and practices that reduce costs and that are friendly to the environment.

The **National Sheep Industry Improvement Center** promotes strategic development activities to strengthen and enhance production and marketing of sheep, goats, and their products in the United States. The center, which has a board of directors to oversee its activities, operates a revolving fund for loans and grants.

The **Research on Rural Cooperative Opportunities and Problems** program provides funding for cooperative research agreements with universities, State agencies, and nonprofit associations. Information and research findings from these projects are published by the institution or by USDA Rural Development.

Cooperative Services helps improve the performance of the Nation's cooperatives and promotes understanding and use of the cooperative form of business. By working together for their mutual benefit in cooperatives, rural residents are often able to reduce costs for production supplies and consumer goods, obtain services that might otherwise be unavailable, and achieve greater returns for their products. Cooperative Services accomplishes its mission by (1) responding to requests for technical assistance from rural residents who want to organize a cooperative or improve operations of an existing cooperative; (2) providing information and educational materials relating to cooperatives; (3) conducting research on cooperative financial, structural, managerial, policy, member governance, legal, and social issues; and (4) collecting and disseminating statistics to support research and technical assistance work.

Rural Business Opportunity Grants can be made to provide technical assistance training and planning for business and economic development in rural areas.

Cooperative Solutions for Rural Challenges

USDA has a long history of promoting cooperatives—businesses that are owned and controlled by the people who use them. Co-ops help rural people maintain control of local resources and improve their standard of living. In the United States, there are an estimated 40,000 cooperatives that do everything from helping farmers market and process their crops to providing electricity and credit services.

Cooperatives are organized by people who want to: (a) improve their bargaining power, (b) reduce their costs for goods or services, (c) obtain products or services otherwise unavailable to them, (d) expand their marketing opportunities, (e) improve their product service or quality, or(f) increase their income.

For 65 years, USDA has been providing ideas and leadership to the cooperative community through its prize-winning magazine, "Rural Cooperatives," published bimonthly. Each issue carries news, features, and columns that report on issues impacting cooperatives and highlighting successful co-op practices. USDA Rural Development also provides the public with more than 100 publications and videos about cooperatives—ranging from "How to Start a Cooperative" to "Tax Treatment for Cooperatives." To order a free publication and video catalog or to request a magazine subscription order form, call (202) 720-8381.

Rural Housing Service

Decent, safe, sanitary, affordable housing and essential community facilities are indispensable to vibrant rural communities. USDA's Rural Housing Service (RHS) has the responsibility to make these essential elements available to rural Americans. RHS programs help finance new or improved housing for more than 60,000 moderate- or low-income families each year. These programs also help rural communities finance construction, enlargement, or improvement of fire stations, libraries, hospitals, medical clinics, day care centers, industrial parks, and other essential community facilities.

Home Ownership Loans provide assistance to low-income households in rural communities, helping them to purchase, construct, repair, or relocate a home. Borrowers are offered 33-year direct loans at fixed interest rates with annual subsidy to bring the effective interest rate to as low as 1 percent, depending on the family's adjusted income. Moderate-income rural residents can be assisted with loan guarantees offered through private lenders at terms up to 30 years. The loans, both direct and guaranteed, can cover up to 100 percent of market value or acquisition cost, whichever is less.

Home Improvement and Repair Loans and Grants enable very low-income rural homeowners to remove health and safety hazards from their homes and to make homes accessible for people with disabilities. Loans have a maximum interest rate of 1 percent. Grants are available for people age 62 and older who cannot afford to repay a loan. A combination of funds from a loan and grant can be used by eligible elderly residents. Housing preservation grants are made to nonprofit groups and government agencies to finance rehabilitation of rental units for low-income residents.

Rural Rental Housing Loans finance construction of rental and cooperative housing for low-income individuals and families, including elderly or disabled persons. Loans have a maximum term of 30 years, can equal up to 100 percent of the appraised value or development cost, whichever is less, and can be used to construct new housing or to purchase or rehabilitate existing structures. In addition to the direct lending program, USDA offers loan guarantees to extend the reach of Federal resources to some lower income working families and elderly individuals.

Rental Assistance payments subsidize rent costs to ensure that low-income tenants will pay no more than 30 percent of their income for rent.

Community Facilities Loans, Loan Guarantees, and Grants finance the construction, enlargement, extension, or other improvements for community facilities providing essential services in rural areas and towns with a population of 50,000 or less. Funds are available to public entities such as municipalities, counties, special-purpose districts, Indian tribes, and nonprofit corporations.

Housing for Farm Workers

Farm workers are among the most poorly housed and lowest paid workers in the United States. RHS provides housing for migrant and farm laborers through several programs. The Farm Labor Housing program provides loans to public or nonprofit agencies or to farmers to enable them to build farm labor housing. In States such as California, many farm laborers are able to build their own homes through our Mutual Self-Help Housing Program.

Outreach to Native Americans

The Rural Housing Service is reaching out to better inform Native Americans of our programs and working to overcome barriers to lending on tribal land. In FY 1999, Single Family Housing direct loans and grants worth $13 million were made to buy or to repair homes for Native Americans, including $1.9 million, to build approximately 31 single family houses on tribal lands. An additional $44.2 million guaranteed another 390 housing loans made to Native Americans by private sector lenders. Loans and grants made through the Housing Repair program totaled over $2 million and repaired 365 dwellings.

In FY 1998, the Community Facilities program made 16 loans and grants to federally recognized Indian tribes, for a total of $5.2 million. These ranged from a $29,000 grant to the Band of Nor-El-Muk in California for a city hall to a $1.5 million loan guarantee to the Chitimacha Tribe in Louisiana for building an assisted-living complex. Six other loans and grants for almost $10 million were made for facilities that primarily will serve Native Americans.

In 6 States, we used $10.4 million of Multi-Family Housing funds in FY 1998 to build 9 rental housing complexes containing 197 apartments on Native American reservations or in communities where most tenants will be Native Americans. Over $900,000 in housing preservation grants was provided to nonprofits or tribes in 9 States for repair of 170 deteriorating single- or multi-family units that house low-income Native American families.

Building Partnerships

Partnerships with the private and nonprofit sectors form the foundation of several RHS programs. For example, our private, nonprofit partners operate USDA-funded multi-family housing complexes, looking after the needs of the tenants and maintaining the properties. Partners deliver USDA Community Facilities, Multi-Family and Single Family Guaranteed Loan programs. They provide funds to leverage our loans and help us serve more people. They provide valuable services, such as loan packaging and homebuyer education and outreach. As Federal human and monetary resources shrink, these partnerships will become even more crucial to our daily operations. Therefore, we are actively reaching out to organizations whose goals and missions complement ours. This section describes a number of different types of partnerships found in our programs, from homeownership to child care, and multi-family housing managers to leveraging.

Guaranteed Loan Programs

Some of our most important partnerships are created through our loan guarantees. RHS has loan guarantee programs in the Single Family, Rural Rental Housing, and Community Facilities programs. This type of loan is a collaboration with local lenders by which the lender funds the loan and RHS issues a guarantee for up to 90 percent of the amount of the loan. With the assurance of RHS behind them to protect them in case of default, banks are more confident and willing to extend eligibility to a wider range of customers. For example, a prospective homeowner unable to afford a downpayment could still buy a home because he or she could borrow the full amount using a lender backed by a USDA guarantee.

President's National Partnership in Homeownership

The National Partnership in Homeownership is a Presidential initiative which sets up a partnership between government and the private sector to address homeownership issues at the local level. The partners work to enhance the relationship between Federal, State, and local government and the private sector and to expand homeownership opportunities.

The Rural Home Loan Partnership

The Rural Home Loan Partnership, begun in 1996 under the President's National Partnership for Homeownership initiative, saw great success in 1998 as the homeownership rate reached an all-time high of over 66 percent nationally and 75.1 percent in rural areas. The Partnership, which expanded in 1998, now includes Rural Local Initiatives Support Corporation (Rural LISC), the Federal Home Loan Bank System, the Office of Thrift Supervision, the Federal Deposit Insurance Corporation (FDIC) and the Office of the Comptroller of the Currency (OCC), as well as USDA Rural Housing Service.

The partnership delivers a new single-family mortgage product which enables families earning 80 percent of area median income or below to achieve homeownership. RHS provides a subsidized mortgage to cover part of the cost of a house, while

a local bank finances the remainder. Private, nonprofit community development corporations identify and counsel eligible borrowers. RHS' partnership with community development corporations helps direct resources to needy areas, provides technical assistance, and builds partnerships for other Rural Development initiatives. In 1998, the Rural Home Loan Partnership made home loans worth $19.8 million ($13 million from RHS and $6.8 million from the other partners) to help 284 families become successful homeowners.

Community Development Financial Institution Partnership

The Community Development Financial Institution Partnership was created in 1998 between RHS and various community development financial institutions (CDFI's) throughout the country. The purpose of the partnership is to provide homeownership opportunities to low-income applicants by combining the resources of RHS and CDFI's.

CDFI's are specialized private institutions that serve populations whom traditional financial institutions are not serving. They provide a wide range of financial products and services to under-served communities. Some of these services include mortgage financing for first-time homebuyers and basic financial services needed by low-income households. RHS and the CDFI's have a common goal of working to build stronger communities through creating healthy local economies, restoring communities, generating local tax revenues, and empowering residents by increasing homeownership. In most cases, other partners are included in the partnerships to provide homeownership counseling and sometimes additional sources of leveraged funds.

In 1998, through this partnership, the Rural Housing Service funded 50 loans with $2.5 million in 10 local partnerships. The CDFI's and other funding sources provided over $1 million to leverage with the RHS funds. Over 65 percent of the families served had incomes of 50 percent or less of the median income for the area.

Centralized Service Center Improves Operations

In October 1996, a Centralized Service Center (CSC) in St. Louis, MO, opened to provide automated loan servicing to RHS single-family housing borrowers. This effort exemplifies the reinvention of Government, intended to make Government services work better and cost less. The service greatly expands services to borrowers while substantially reducing the staff needed to operate the program nationally.

In its first year of full operation, CSC refined its mortgage servicing system to increase the speed and accuracy of information about borrower accounts. Payments are posted on the day they are received, unless legal action is pending. During FY 1998, CSC automated much of its pay-off functions. Pay-off quotations are now provided within 2 business days, instead of the 10 days it previously took to provide data.

The staff at the CSC have received specialized training to serve customers more effectively. About 60 CSC staff members are fluent in Spanish so that they can assist the 14 percent of the RHS borrowers who speak Spanish. The CSC's monthly statements, major letters, and telephone service are provided in both English and Spanish. A program specialist fluent in Navajo is available to service the accounts of members

of the Navajo nation. CSC is maintaining an ongoing effort to provide additional services to customers and keep them as successful homeowners. During FY 1998, the Servicing Partnership Team was implemented to provide customers with additional contact opportunities from Rural Development field offices.

Rural Utilities Service

USDA Rural Utilities Service (RUS) programs touch the lives of tens of millions of rural Americans daily. Through project financing and technical assistance, RUS builds infrastructure to provide rural businesses and households with modern telecommunications, electricity, and water. Today, this also means bringing the "information superhighway" to rural America.

The **Water 2000 Initiative** is an ambitious undertaking to extend safe, dependable drinking water to rural communities. At least 2.2 million rural Americans live with critical quality and accessibility problems with their drinking water, including an estimated 730,000 people who have no running water in their homes. Since it started in 1994, Water 2000 has already improved drinking water quality or provided a public water supply for the first time to some 2.5 million people in more than 1,300 rural communities nationwide.

RUS is a partner with rural business and economic development efforts, providing infrastructure that is the foundation for competitiveness. It is a technical and financial resource in a time of change for rural utilities.

Rural Telecommunications Loans and Loan Guarantees build modern rural communications systems that provide rural areas with "on ramps" to the information superhighway by making financing available for telecommunications facilities. Loans made to rural telephone cooperatives and companies help bring reliable and affordable telecommunications services to more than 15 million rural Americans.

Rural Electric Loans and Loan Guarantees provide reliable, safe, and affordable electricity to rural America by financing power distribution, generation, and transmission systems. Loans are made to nonprofit and cooperative associations, public bodies, and other utilities which serve more than 25 million rural Americans.

Distance Learning and Medical Link Loans and Grants bring distance learning and telemedicine to rural America. Education and adequate medical care are crucial to the survival of rural communities, but are becoming increasingly difficult to provide to rural communities. This program employs innovative ways to use existing telecommunications infrastructure to extend the reach of educational and medical expertise into communities without that expertise. The new loan program is being developed to further expand rural telecommunications infrastructure.

Water and Waste Disposal Loans and Grants develop water and waste disposal systems (including solid waste disposal and storm drainage) in rural areas and towns with populations of less than 10,000. The funds are available to public entities such as municipalities, counties, special-purpose districts, Indian tribes, and nonprofit corporations. RUS also guarantees water and waste disposal loans made by banks and other eligible lenders.

Emergency Community Water Assistance Grants help rural communities that have experienced a significant decline in drinking water quantity or quality to make emergency repairs and replace existing facilities. Grants can be made in rural areas and towns with a population of 10,000 or less and a median household income of no more than 100 percent of the State's median nonmetropolitan household income.

Office of Community Development

USDA Rural Development's Office of Community Development administers the Empowerment Initiative, a Presidential initiative designed to provide economically depressed rural areas and communities with real opportunities for growth and revitalization. Its mission: to create self-sustaining, long-term economic development in areas of pervasive poverty, unemployment, and general distress, and to demonstrate how distressed communities can achieve self-sufficiency through innovative and comprehensive strategic plans developed and implemented by alliances among private, public, and nonprofit entities.

In the first selection round, announced in December 1994, three rural Empowerment Zones (EZ) and 30 rural Enterprise Communities (EC) were designated by President Clinton and Vice President Gore. Each EZ is receiving $40 million and each EC $2.97 million in a Federal grant. This one-time, 10-year grant is in addition to funding benefits and tax incentives. In the second round, announced in December 1998, Clinton and Gore designated an additional 5 rural Empowerment Zones and 20 rural Enterprise Communities. Each of these EZ's receives $2 million and each EC $250,000 in an initial Federal grant. Additional funding benefits and tax incentives are also available to Round II communities. Further, designated communities qualify for earmarks of program funds from Rural Development agencies.

Community Empowerment

There are no written guidelines or formula to give to communities regarding community empowerment. Community empowerment is a flexible evolving process that is different for each community. It includes a number of tangible and intangible benefits that will enable a community to achieve its goals. The basic elements of community empowerment include:

- Learning to use its own initiative to secure resources from many sources (Federal, State, local, corporate, foundations, etc.) to implement its strategic plan.
- Using citizen participation on the board and in program administration to improve, through experience, the community's ability to manage its programs and monitor the programs of its subgrantees.
- Developing within communities an alliance of community leaders that will obtain the capacity to plan, organize, manage, and implement its strategic plan to generate sustainable community and economic revitalization.
- For sustained economic and community development, focusing on the interrelationships between community needs and a variety of connected programs rather than on narrow single-purpose programs; i.e., business development,

job training, public education, housing, transportation, day care, shopping center, roads, water and sewer, etc. Through this process, local leadership skills are increased and the community's capacity to help itself. This is empowerment. Once this is learned, it cannot be taken away.

- Regional partnerships that bring representatives from several communities to discuss issues and work collectively to identify opportunities and strategies to resolve challenges that face their region as a whole.
- Educational initiatives that provide job training for family wage jobs, computer skills training, and youth development initiatives to prepare young people for the working world.
- Enabling all segments of society to have a voice when it comes to mapping out a path for community empowerment and providing mechanisms for those who previously fell outside of the system to become involved and play a part in securing a better future for them and their families.
- Learning, through information sharing communities, the "best practices" for instituting economic and community development programs and projects.

Champion Communities

More than 180 rural communities organized and completed the valuable strategic planning process as part of their application for Round I of the Initiative. To assure that their important work produced continuing benefits to these communities, USDA designated them as "Champion Communities" and provided continuing assistance to them. During Round II, 160 communities submitted applications; 15 of the 25 designated communities were Champion Communities from Round I. Communities that submitted applications for the first time in Round II are now eligible for Champion status.

National Centers of Excellence: College/University Partnership Project

Local capacity building toward economic sustainability is being enhanced through a 2-year partnership among four rural colleges and USDA. The five colleges and universities assist EZ/EC communities with strategic plan implementation through training programs and other sources of expertise.

National Centers of Excellence: Tribal College Partnership

A related initiative helps tribal communities develop empowerment programs through the technical assistance of tribal colleges. With assistance from USDA, the colleges are developing programs of training and community service to address the critical needs of the communities they serve. The initiative responds to President Clinton's Executive Order 13021, which asked Federal departments and agencies to integrate American Indian tribal colleges into their programs.

Rural Economic Area Partnership (REAP) Zones

Rural areas in the Northern Great Plains face unique challenges due to their isolation, low-density populations, and changing economic base. Rather than high poverty, these areas are challenged by declining populations, slowing economic activity, and growing difficulty in providing public services. To counter these troubling trends, two REAP Zones were established in multi-county areas of **North Dakota**.

Round I Empowerment Zones

Kentucky Highlands—KY
Mid-Delta—MS
Rio Grande Valley—TX

Round I Enterprise Communities

Chambers County—AL
Greene & Sumter Counties Rural—AL
East Central Arkansas—AR
Mississippi County—AR
Arizona Border Region—AZ
Imperial County—CA
City of Watsonville—CA
Jackson County, Florida—FL
Crisp/Dooly—GA
Central Savannah River Area—GA
Northeast Louisiana Delta—LA
Macon Ridge—LA
Lake County—MI
City of East Prairie,—MO
North Delta Mississippi—MS
Halifax/Edgecombe/Wilson—NC
Robeson County—NC
La Jicarita—NM
Greater Portsmouth—OH
Southeast Oklahoma—OK
Josephine County—OR
City of Lock Haven Federal—PA
Williamsburg-Lake City—SC
Beadle/Spink/South Dakota—SD
Fayette County/Haywood County—TN
Scott/McCreary Area—TN
Accomack-Northampton, Virginia—VA
Lower Yakima County Rural—WA
Central Appalachia —WV
McDowell County—WV

Round II Empowerment Zones

Desert Communities—CA
Southwest Georgia United—GA
Southernmost Illinois Delta—IL
Lake Aggasiz—ND
Oglala Sioux Tribe—SD

Round II Enterprise Communities

Metlakatla Indian—AK
Four Corners—AZ
Cities of Orange Cove, Huron, Parlier,
Tule Tribe—CA
Empowerment Alliance of Southwest
Florida—FL
Molokai—HI
Town of Austin—IN
Wichita County—KS
Bowling Green—KY
City of Lewiston—ME
Clare County—MI
Fort Peck Assiniboine and Sioux Tribe—MT
City of Deming—NM
Tri County Nations—OK
Fay-Penn—PA
Allendale ALIVE—SC
Clinch-Powell—TN
Middle Rio Grande—TX
Tri-County Rural—WA
Northwoods Niijii—WI

Rural areas in the southern tier of **New York** face unique challenges due to their isolation, low-density populations, and changing economic base. Rather than high poverty, these areas are challenged by declining populations, job loss, slowing economic activity, and growing difficulty in providing public services. To counter these troubling trends, two REAP Zones were established in multi-county areas of New York.

Southwest Border Regional Partnership

In response to Vice President Gore's challenge that EZ/EC adopt regional approaches to planning and problem-solving, Empowerment Zones, Enterprise Communities, and Champion Communities from the southwest border region formed the Southwest Border Region Partnership.

Delta Regional Initiative

The Mississippi Delta also has a similar regional initiative to eliminate poverty and economic distress in the counties of the lower Mississippi Delta. Seven Delta States were involved in a Lower Mississippi Delta Development Commission study of poverty that began in 1989. The Delta Regional Initiative joins the Southern EZ/EC forum, The Lower Mississippi Delta Development Center (formerly Commission), The Foundation for the Mid-South, and The Enterprise Cooperation of the Delta in a Partnership Agreement to develop a long-range strategic plan and implement the recommendations from the Lower Mississippi Delta Development Commission's Report—"The Delta Initiative." The Delta Regional Initiative includes both urban and rural EZ and EC from 219 counties in 7 States.

Selected Accomplishments by Rural Empowerment Zones and Enterprise Communities (EZ/EC) as of January 2000	
New businesses attracted to Rural Empowerment Zones and Enterprise Communities	249
Businesses served through Intermediary Relending Programs/Revolving Loans/Micro Loans	438
Businesses served through business development and job training initiatives	1,299
Businesses started through incubators and entrepreneurial initiatives	167
Clients placed in jobs through career planning and job placement programs	1,861
Clients served through business development and job training initiatives	11,881
Jobs created or saved	10,892
New loan funds established for business development and job training	66
Loans provided for business development and job training	516
New electric, gas, and water/drainage hookups	513
New or improved water/drainage system	48
New/upgraded computers provided	588
Number of new staff members hired to work in EZ/EC Communities	118
Number of staff trained in EZ/EC Communities	1,682
Number of new houses constructed and houses rehabilitated	2,112
Number of new health care professionals hired and health care providers trained	63

For More Information:

Rural Development

Acting Director, Legislative & Public Affairs
Gladys Rodriguez
Rm 5039-S
Washington, DC 20250
202-720-1019
FAX 202-690- 4083
gladys.rodriguez@usda.gov

Deputy Public Affairs Director
Dan Campbell
Rm 5040-S
Washington, DC 20250
202-720-6483
FAX 202-690-4083
dan.campbell@usda.gov

Deputy Legislative Director
Brenda Morton
Rm 2123-S
Washington, DC 20250
202-720-2367
FAX 202-690-0311
bmorton@rurdev.usda.gov

Acting Deputy Director
Correspondence Branch
Martha Harvin
Rm 5007-S
Washington, DC 20250
202-720-8472
FAX 202-720- 1161
mharvin@rdmail.rural.usda.gov

Freedom of Info Act Officer
Dorothy Hinden
Rm 0361-S
Washington, DC 20250
202-690-0031
FAX 202-692-0034
dhinden@rdmail.rural.usda.gov

7. Farm and Foreign Agricultural Services

The Farm and Foreign Agricultural Services mission area includes three agencies: the Farm Service Agency (FSA), the Foreign Agricultural Service (FAS), and the Risk Management Agency (RMA). This mission area serves production agriculture, helping to keep America's farmers and ranchers in business as they face the uncertainties of weather and markets.

These agencies deliver commodity, credit, conservation, and emergency assistance programs that help improve the stability and strength of the agricultural economy, expand overseas markets for U.S. agricultural products, and promote world food security. They also sanction the provision by the private sector of a broad-based crop insurance program and other risk management tools.

The ongoing evolution of the Farm and Foreign Agricultural Services mission area, through reorganization, crop insurance reform, and farm program changes, has profoundly altered the way it operates. The Federal Agriculture Improvement and Reform Act of 1996 replaced the traditional Federal role in some farm programs with the economic forces of the marketplace. The management of risk in this volatile setting has moved more fully to an emerging partnership between Government and the private sector.

The public interest calls for a dynamic, efficient agriculture that provides a sustainable, safe, and affordable food and fiber supply. The challenge is to serve this public interest at a time of diminishing resources and a decreased role for the Federal Government.

Farm Service Agency

FSA Mission

The FSA mission is to ensure the well-being of American agriculture and the American public through efficient and equitable administration of agricultural commodity, farm loan, conservation, environmental, emergency assistance, and domestic and international food assistance programs.

The FSA home page can be found at *http://www.fsa.usda.gov*

FSA Vision

FSA is a customer-driven agency with a diverse and multi-talented workforce, empowered and accountable to deliver programs and services efficiently, and dedicated to promoting an economically viable and environmentally sound American agriculture.

What Is FSA?

FSA was established when USDA was reorganized in 1994, incorporating programs from several agencies, including the Agricultural Stabilization and Conservation Service, the Federal Crop Insurance Corporation (now a separate Risk Management Agency), and the Farmers Home Administration. Though its name has changed over the years, the agency's relationship with farmers dates back to the 1930's.

At that time, Congress set up a unique system under which Federal farm programs are administered locally. Farmers who are eligible to participate in these programs elect a three- to five-person county committee that reviews county office operations and makes many of the decisions on how to administer the programs. This grassroots approach gives farmers a much-needed say in how Federal actions affect their communities and their individual operations. After more than 60 years, it remains a cornerstone of FSA's efforts to preserve and promote American agriculture.

1996 Act

The 1996 Farm Bill significantly changed U.S. agricultural policy by removing the link between income support payments and farm prices. Farmers who participated in the wheat, feed grains, cotton, and rice programs in any one of the previous 5 years could enter into 7-year production flexibility contracts and receive a series of fixed annual "transition payments." These payments are independent of farm prices and specific crop production, in contrast to the past, when deficiency payments were based on farm prices and the production of specific crops.

The Federal Government no longer requires land to be idled, nor does it deny payments if farmers switch from their historical crops. The contract, however, requires participating producers to comply with existing conservation plans for the farm, wetland provisions, and planting flexibility provisions, and to keep the land in agricultural uses.

The law provided for a one-time signup, which ended August 1, 1996, for producers to enter into production flexibility contracts. There will be no additional signups except for land coming out of the Conservation Reserve Program. Farmers who entered into a contract are also eligible for market transition loans at local FSA offices.

Marketing Assistance Loan Programs

FSA administers commodity loan programs for barley, corn, honey, grain sorghum, mohair, oats, oilseeds, peanuts, rice, sugar, tobacco, wheat, upland and extra-long-staple cotton.

The agency provides the operating personnel for the Commodity Credit Corporation (CCC), which provides assistance with respect to products of certain agricultural commodities through loans and purchases. This provides farmers with interim financing and helps maintain balanced and adequate supplies of farm commodities and their orderly distribution throughout the year and during times of surplus and scarcity.

Instead of immediately selling the crop after harvest, a farmer who grows an eligible crop can store the commodity and take out a "nonrecourse" loan for its value, pledging the crop itself as collateral. Nonrecourse means that the producer can discharge debts in full by forfeiting or delivering the commodity to the Government.

The nonrecourse loan allows farmers to pay their bills and other loan payments when they become due, without having to sell crops at a time of year when prices tend to be at their lowest. Later, when market conditions are more favorable, farmers can sell crops and repay the loan with the proceeds. Or, if the prevailing price of the crop remains below the loan level set by CCC, farmers can keep loan proceeds and forfeit the crop to CCC instead. The repayment rate may also be reduced by USDA to minimize the costs of storing commodities and to allow commodities produced in the United States to be marketed freely and competitively, both domestically and internationally.

CCC loan rates are designed to keep crops competitive in the marketplace. A producer must have entered into a production flexibility contract to be eligible for nonrecourse marketing assistance loans for wheat, feed grains, rice, and upland cotton. Any production of a contract commodity by a producer who has entered into a production flexibility contract is eligible for loans.

Nonrecourse loans are also available for extra-long-staple cotton, oilseeds, peanuts, tobacco, raw cane sugar, and refined beet sugar, regardless of whether the producer has entered into a production flexibility contract. Price support for the marketing quota crops—tobacco and peanuts—is made available through producer loan associations. By law, these programs must operate at no net cost to the U.S. Treasury, and no-net-cost and marketing assessments are applied to both producers and purchasers.

Commodity Purchase Programs

Forfeitures under nonrecourse commodity loan programs are not the only means by which CCC acquires inventory. Under the dairy price support program, CCC buys surplus butter, cheese, and nonfat dry milk from processors at announced prices to support the price of milk. These purchases help maintain market prices at the legislated support level. This program was to be replaced in 2000 with a recourse loan program. However, the 2000 Act extended the dairy price support program until 2001.

CCC can store purchased food in over 10,000 commercial warehouses across the Nation approved for this purpose. However, commodity inventories are not simply kept in storage. FSA employees work to return stored commodities to private trade channels. At the agency's Kansas City Commodity Office in Kansas City, Missouri, FSA merchandisers regularly sell and swap CCC inventories using commercial telecommunications trading networks.

Beyond the marketplace, CCC commodities fill the need for hunger relief both in the United States and in foreign countries. FSA employees work closely with USDA's Food and Nutrition Service to purchase and deliver foods for the National School Lunch and many other domestic feeding programs. When donated to "Food for Peace," and programs administered by voluntary organizations, these U.S. farm products and foods help USDA fight hunger worldwide.

Disaster Assistance Available From FSA

The Noninsured Crop Disaster Assistance Program (NAP) provides eligible producers of eligible crops with protection comparable to the catastrophic risk protection plan of crop insurance (see Risk Management Agency). It helps reduce production risks faced by producers of crops for which Federal crop insurance is not available. It also reduces financial losses that occur when natural disasters cause a catastrophic loss of production or prevented planting of an eligible crop.

Eligible crops include certain commercial crops or other agricultural commodities (except livestock):

- for which catastrophic risk protection under section 508(b) of the Federal Crop Insurance Act is not available; and
- that are produced for food or fiber.

Crops specifically included by statute include floricultural, ornamental nursery, and Christmas tree crops, turfgrass sod, seed crops, aquaculture (including ornamental fish), and industrial crops.

When damage to a crop or commodity occurs as a result of a natural disaster, producers requesting NAP assistance must meet certain requirements.

Emergency Loans

FSA provides emergency loans to help cover production and physical losses in counties declared disaster areas by the President or designated by the Secretary of Agriculture or the FSA Administrator (physical loss loans only). Emergency loans also are available in counties contiguous to such disaster areas. These loans are made to qualifying established family farm operators. Loans for crop, livestock, and non-real-estate losses are normally repaid in 1 to 7 years, and in special circumstances, up to 20 years. Loans for physical losses to real estate and buildings are normally repaid in 30 years, and in special circumstances, up to 40 years.

Other Emergency Assistance

In the aftermath of a natural disaster, FSA makes available a variety of emergency assistance programs to farmers in counties that have been designated or declared disaster areas.

FSA has several programs that are activated, usually by congressional action, during certain types of disasters. Among these are the Tree Assistance Program, which provides payments to eligible tree and vineyard growers who incurred losses due to natural disasters, including losses caused by freeze, excessive rainfall, floods, drought, tornado, and earthquakes.

Another such program, the Livestock Indemnity Program, helps livestock producers who suffered losses from recent natural disasters. It provides a partial reimbursement to eligible producers for livestock losses.

The Dairy Production Disaster Assistance Program helps dairy producers who suffered losses from natural disasters by providing a partial reimbursement for milk losses.

The Small Hog Operation Payment Program involved direct cash payments made to small hog producers to help them weather economic crisis. USDA estimated that 80-90 percent of producers, or nearly 100,000 nationwide, were eligible for these payments.

In the event of a national emergency, FSA is responsible for ensuring adequate food production and distribution, as well as the continued availability of feed, seed, fertilizer, and farm machinery.

Emergency Conservation Program

The Emergency Conservation Program provides emergency cost-share funding for farmers to rehabilitate farmland damaged by natural disasters that create new conservation problems which, if not treated, would:

- impair or endanger the land,
- materially affect the productive capacity of the land,
- represent unusual damage which is not the type likely to recur frequently in the same area,
- be so costly to repair that Federal assistance is or will be required to return the land to productive agricultural use.

The assistance may be used for: removing debris from farmland; grading, shaping, and re-leveling farmland; restoring livestock fences; and restoring irrigation structures.

Farm Loans

FSA offers direct and guaranteed farm ownership and operating loan programs to farmers who are temporarily unable to obtain private, commercial credit and who meet other regulatory criteria. Often, these are beginning farmers who cannot qualify for conventional loans because they have insufficient net worth. The agency also helps established farmers who have suffered financial setbacks from natural disasters, or whose resources are too limited to maintain profitable farming operations.

Under the guaranteed farm loan program, the agency guarantees loans made by conventional agricultural lenders for up to 95 percent of principal, depending on the circumstances. The lender may sell the loan to a third party; however, the lender is always responsible for servicing the loan. All loans must meet certain qualifying criteria to be eligible for guarantees, and FSA has the right to monitor the lender's servicing activities. Farmers interested in guaranteed loans must apply to a conventional lender, who then arranges for the guarantee.

For those unable to qualify for a guaranteed loan, FSA also lends directly. Direct loans are made and serviced by FSA officials who also provide borrowers with supervision and credit counseling. Funding authorities for direct loans are limited, and applicants may have to wait until funds become available. To qualify for a direct farm ownership or operating loan, the applicant must be able to show sufficient repayment ability, pledge enough collateral to fully secure the loan, and meet other regulatory criteria.

Conservation Programs

The Conservation Reserve Program (CRP) protects our most fragile farmland by encouraging farmers to stop growing crops on highly erodible and other environmentally sensitive acreage. In return for planting a protective cover of grass or trees on vulnerable property, the owner receives a rental payment each year of a multi-year contract. Cost-share payments are also available to help establish permanent areas of

grass, legumes, trees, windbreaks, or plants that improve water quality and give shelter and food to wildlife.

In the 18th CRP signup, held in 1998, about 5 million acres of land were accepted into the program. The accepted acreage includes 3.2 million acres of highly erodible land, almost 2.8 million acres of land located within conservation priority areas, over 450,000 acres of wetland and protective upland acres, and 217,000 acres to be restored to rare and declining habitats. Also, bids involving over 102,000 acres of long leaf pine habitat were accepted.

Another conservation program, the Conservation Reserve Enhancement Program, is part of the CRP. This program shields millions of acres of American topsoil from erosion by encouraging the planting of protective vegetation. By reducing wind erosion as well as runoff and sedimentation, it also protects air and groundwater quality and helps improve countless lakes, rivers, ponds, streams, and other bodies of water.

State governments have the opportunity to participate in this groundbreaking environmental improvement effort. USDA provides incentives to agricultural producers to participate, while State governments contribute specialized local knowledge, technical help, and financial assistance. The result is an environmental enhancement effort tailored to the specific environmental needs of each State.

FSA works with USDA's Natural Resources Conservation Service and other agencies to deliver other conservation programs, including the Environmental Quality Incentives Program (EQIP). EQIP helps farmers and ranchers improve their property to protect the environment and conserve soil and water resources. Participants can take advantage of education in new conservation management practices, technical support, cost-share assistance, and incentive payments.

Where To Get More Information on FSA Programs

- Further information and applications for the programs described in this chapter are available at local FSA offices. These are usually listed in telephone directories in the section set aside for governmental/public organizations under "U.S. Department of Agriculture, Farm Service Agency." FSA State offices supervise the agency's local offices and are usually located in the State capital or near the State land-grant university.
- For information on commodity sales and purchases, contact:
  USDA FSA Kansas City Commodity Office
  P.O. Box 419205
  Kansas City, MO 64141-6205
  Telephone: 816-926-6364
- FSA's aerial photographs of U.S. farmlands are used extensively by Government and private organizations and the public. Order forms and an index are available from FSA local offices. For more information on photographic services, including high-altitude photography, contact:
  USDA FSA Aerial Photography Field Office
  2222 West 2300 South
  Salt Lake City, UT 84119-2020
  Telephone: 801-975-3500

Success Stories

Dialing for Hog Relief

In an effort to reach out to struggling hog producers, employees from several USDA agencies created and staffed an "800" number for farmers to get information on FSA's Small Hog Operation Payment (SHOP) Program. The workers answered questions on application procedures and qualifications from several hundred hog farmers. Fifty million dollars was provided to financially suffering hog farmers through direct cash payments.

"Hay Net" Aids Drought-Distressed Livestock

In August 1998 a new program was initiated to match farmers and ranchers without enough hay to feed their drought-distressed livestock with those who had surplus hay. Those in need registered at FSA's local offices and received a list of the closest producers with hay to spare, and vice versa. Farmers then could contact each other and make appropriate arrangements. It was a good example of farmers helping farmers, and a great tool for getting hay where it was needed as quickly and efficiently as possible.

Louisiana FSA Helps Fulfill a Dream

John Jenkins worked at local dairies in Louisiana for most of his life, and he wanted to operate his own dairy farm. With the assistance of a FSA county committee member, Jenkins was able to apply for and receive a loan to help him get started. His new farm is one of just seven minority-operated dairies in the State, which had 581 dairies in 1997.

Gleaning Success

FSA won first place in the 1998 USDA Food Drive, collecting 277,628 pounds of food, more than twice as much as its goal of 100,000 pounds and more than any other USDA agency. The food was donated to food banks, churches, homeless shelters, and soup kitchens.

A Green Thumb Up for a Youth Loan Borrower

Missourian Holly Norman always was fascinated with growing plants and flowers. She wanted to start up a greenhouse business, but, being only 14, couldn't get funds from a commercial institution.

She went to FSA's Polk County office to check out loan possibility. Her plan of operation was found to be top notch, and she got her loan, naming her business the Little Bit of Garden. She got two greenhouses built and stocked them with landscaping, vegetable, bedding, and house plants. Holly tends to her business every day and knows, even though her family helps out, that the responsibility for her loan repayment is hers. Any profit she makes goes toward repaying the loan, and FSA is sure she'll make a great business owner.

Foreign Agricultural Service

The Agency and Its Mission

The Foreign Agricultural Service (FAS) is a USDA agency that represents the diverse interests of U.S. farmers and the food and agricultural sector abroad. It collects, analyzes, and disseminates information about global supply and demand, trade trends, and emerging market opportunities. FAS seeks improved market access for U.S. products and implements programs designed to build new markets and to maintain the competitive position of U.S. products in the global marketplace.

FAS also carries out food aid and market-related technical assistance programs, and operates a variety of congressionally mandated import and export programs. FAS helps USDA and other Federal agencies, U.S. universities, and others enhance the global competitiveness of U.S. agriculture and helps increase income and food availability in developing nations by mobilizing expertise for agriculturally led economic growth.

Formed in 1953 by executive reorganization, FAS is one of the smaller USDA agencies, with about 950 employees. FAS operates worldwide with staff in 80 posts covering more than 130 countries. Washington-based marketing specialists, trade policy analysts, economists, and others back up the overseas staff.

Roughly 70 percent of the annual FAS budget is devoted to building markets overseas for U.S. farm products. This includes the funding for all of FAS' trade and attache offices overseas, as well as its work with U.S. commodity associations on cooperative promotion projects. The remaining funds cover other trade functions, including gathering and disseminating market information and trade policy efforts. To get a complete picture of the services offered and information available for exporters, FAS invites you to visit its homepage at: *http://www.fas.usda.gov*

Overseas Representation

FAS' foreign service officers, with a support staff headquartered in Washington, DC, head up 47 agricultural affairs and 17 agricultural trade offices overseas. In addition, these officers manage 36 satellite offices headed by foreign national employees. Our foreign service officers wear many hats, serving as diplomats, negotiators, reporters, and marketing representatives for U.S. agricultural producers, processors, and exporters. By partnering with other USDA and Federal agencies, international organizations, State and local governments, and the U.S. private sector, our officers provide information used to plan and develop strategies for improving market access, promoting world food security, pursuing U.S. rights under trade agreements, and developing programs and policies to make U.S. farm products more competitive. For example, in FY 1999, FAS offices overseas submitted more than 3,800 reports from 88 different countries, covering 29 different agricultural commodities of interest to the United States. They also advise U.S. ambassadors on agricultural matters and represent U.S. agriculture before the government, trade, and public of their host countries.

Turbulent Decade for Agricultural Exports Ends in a Downturn

Everything's relative, some say. U.S. agricultural exports closed out the decade at $49 billion in fiscal 1999, a $9-billion gain since 1990. Had the path been steadily upward, it would have been judged a rock-solid performance. Instead, exports exploded past $50 billion in mid-decade, climbing to $60 billion in 1996. Bulk commodity prices were high, consumer food exports were setting new records, and optimism reigned.

But that was as good as the numbers would get. For the next 3 years, the momentum turned in another direction, as commodity prices were steadily eroded by large global supplies, increasing competition, a strengthening U.S. dollar, and weakened demand from a global financial crisis that began in Asia. Of course, $49 billion is still ahead of any export levels achieved before the mid-1990's. But, it is also the weakest performance since 1994, down 9 percent from 1998 and a full 18 percent below the 1996 record.

Fiscal Year 1999 Exports Summary

Fiscal year 1999 did not shape up much better. Pressures from large supplies and subsequent low prices maintained their grip on farm commodity markets, even though most countries affected by the crisis are back on the recovery path.

U.S. solid wood products and seafood products fared generally better than agricultural products in 1999 world markets. Wood product sales were down only about 1 percent from the previous year, while seafood netted a 19-percent increase in export value.

U.S. agricultural imports continued to grow in fiscal 1999, edging up to a new record of $37.5 billion. Despite the combination of lower exports and rising imports, agriculture posted its 40th straight annual trade surplus–albeit the lowest surplus since 1987–at $11.5 billion. The highest was $27.2 billion in 1996.

Bulk Agricultural Exports Off 11 Percent

Bulk commodities took another plunge in fiscal 1999, as sagging demand and large global production brought some of the lowest prices in decades. While export volume rose 15 percent to 114 million tons, weak prices more than offset added tonnage. Corn was an exception–a 38-percent increase in tonnage lifted coarse grains to a 12-percent value gain. The major factor: less competition from China and Argentina. For wheat, U.S. aid donations helped prop up volume, but export value still dropped 4 percent. Soybean exports plummeted 23 percent, reflecting large global supplies, weak demand, and rock-bottom prices. Cotton fared worse, with sharply reduced volume from the small U.S. crop, plus low prices. Total U.S. bulk commodity exports were $10 billion below fiscal 1996's $28.8 billion.

Figure 7.1

Nineties Close with U.S. Agricultural Exports at 5-Year Low, But Well Above Decade's Start

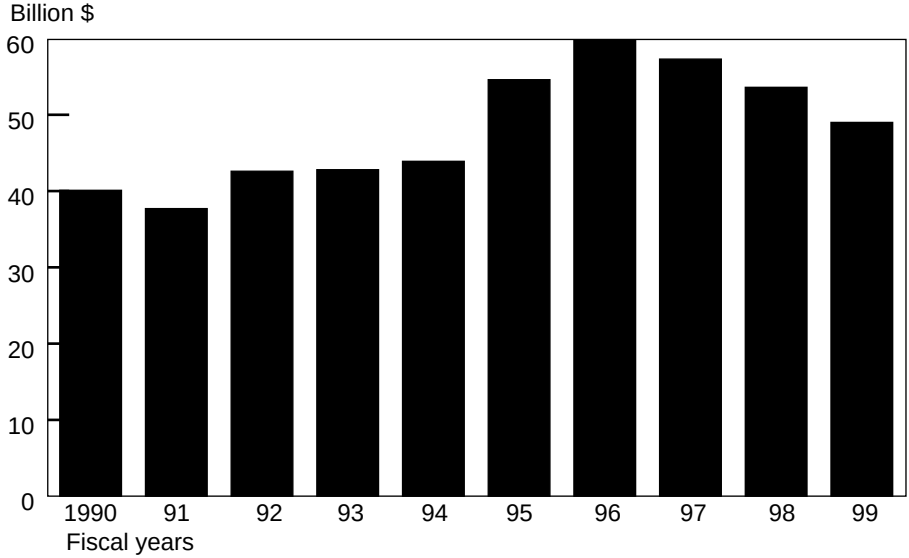


Table 7-1.

U.S. Bulk Commodity Exports, FY 1998-99

	FY 1998	*FY 1999*	*1998-99 change*
Commodity	*—$ million—*		*Percent*
Coarse grains	4,991	5,607	+12
Soybeans	6,137	4,748	-23
Wheat	3,805	3,664	-4
Tobacco	1,448	1,376	-5
Cotton	2,543	1,323	-48
Rice	1,138	1,015	-11
Pulses	319	270	-15
Peanuts	203	188	-7
Other	359	376	+5
Total	**20,942**	**18,566**	**-11**

Note: Fiscal years are October-September (i.e., fiscal 1999 ran Oct. 1, 1998-Sept. 30, 1999).

Exports of Intermediate Agricultural Products Down 12 Percent

U.S. exports of intermediate agricultural products dropped 12 percent in fiscal 1999 to the lowest since 1994. Most product categories were down, with sharp declines for soy meal, soy oil, hides, and animal fats. For oilseed products, large South American supplies, intense competition, and lackluster demand cut prices and volumes. Hides got a tanning as sluggish Asian demand paired with a slowdown from Europe. Bright spots were few. Wheat flour exports surged 52 percent, mainly from U.S. donations to Bangladesh, Yemen, and other destinations, as well as $10 million in sales to Israel. Among the top four U.S. markets, intermediate product sales fell 25 percent to the European Union (EU), 4 percent to Canada, 10 percent to Mexico, and 11 percent to Japan. The record high remains at $12.2 billion in exports, set in 1997.

Consumer Food Exports Not Yet Back on Track

U.S. exports of foods, beverages and other consumer-oriented agricultural products eased for a second year, following 12 record-setting years. The modest 4-percent drop left consumer food sales at $1 billion below 1997's all-time high–but still $8-$9 billion higher than when the decade began. The collapse in Russian buying gets the blame for the 26-percent falloff in poultry meat exports. On the plus side, juices and breakfast cereals set new records, with juices benefiting from strong Asian, European, and North American Free Trade Agreement sales. For consumer foods overall, export records were set to Canada and Mexico, and to some smaller markets, including China. Fiscal 1999 marked the first time that consumer foods topped bulk commodities in export value. Consumer foods accounted for 40 percent of total U.S. agricultural exports, up from 24 percent in 1990.

Most Major Markets Caught in Downtrend

Most major markets contributed to the 1999 downturn. U.S. agricultural exports to Japan fell for the third straight year, while both Canada and Mexico backed off from 1998 records and several years of growth. Weak prices and sales of bulk and semi-processed commodities were mainly responsible, as consumer food sales set new highs in Canada and Mexico. Financial crisis pushed Russia out of the top 10, with a 58-percent dive despite U.S. food aid. China and Hong Kong led a drop in U.S. exports to Asia's Pacific Rim, but South Korea and Taiwan were notable exceptions. A recovering Korean economy helped turn 1998's 32-percent plunge in U.S. exports into a 9-percent rebound for fiscal 1999.

Wood Product Sales Remain in a Slump

Fiscal 1999 marked a second year of weakness for exports of solid wood products. Robust domestic demand kept U.S. prices up, while housing starts in Japan remained slow. Export value dipped below $6 billion to the lowest in the 1990's–off 20 percent from 1997's $7.5 billion record high. Canada finally overtook Japan as our top market. Sales to Japan slumped another 4 percent, adding up to a 50-percent drop since 1996 (an unusually strong year in that market). Meanwhile, exports to Canada

Table 7-2.

U.S. Intermediate Agricultural Product Exports, FY 1998-99

	FY 1998	*FY 1999*	*1998-99 change*
Commodity	*—$ million—*		*Percent*
Feeds & fodder	1,675	1,552	-7
Hides & skins	1,337	1,102	-18
Soybean meal	*1,944	1,065	-45
Veg. oils (excl. soy oil)	*1,027	919	-11
Planting seeds	807	810	0
Sugar, sweeteners, & beverage bases	716	689	-4
Live animals	655	621	-5
Soybean oil	*882	608	-31
Animal fats	629	529	-16
Wheat flour	115	175	+52
Other	2,308	2,558	+11
Total	**12,096**	**10,628**	**-12**

*Denotes a record-high export value.

Table 7-3.

U.S. Consumer Food Exports, FY 1998-99

	FY 1998	*FY 1999*	*1998-99 change*
Commodity	*—$ million—*		*Percent*
Meat, poultry, dairy			
Red meats	4,405	4,369	-1
Poultry meat	2,347	1,743	-26
Dairy products	*931	887	-5
Eggs & products	*225	184	-18
Fruits & vegetables			
Proc. fruit/veg.	*2,086	2,084	0
Fresh fruit	1,853	1,843	-1
Fresh vegetables	1,114	1,101	-1
Fruit/veg. juices	684	*769	+12
Snack foods	*1,326	1,296	-2
Tree nuts	1,218	1,077	-12
Wine & beer	*785	743	-5
Pet foods	734	689	-6
Breakfast cereals & pancake mix	365	*371	+2
Nursery products & cut flowers	*250	249	0
Other	2,282	*2,406	+5
Total	**20,605**	**19,810**	**-4**

*Denotes a record-high export value.

Table 7-4.

U.S. Agricultural Exports by Major Markets, 1998-99

FY 1998	*FY 1999*	*1998-99 change*
Market	*—$ million—*	*Percent*
Japan	9,444	8,916	-6
Canada	*7,006	6,937	-1
European Union	8,318	6,820	-18
Mexico	*5,951	5,661	-5
South Korea	2,244	2,449	+9
Taiwan	1,964	2,044	+4
Hong Kong	1,557	1,259	-19
China	1,505	979	-35
Egypt	939	946	+1
Philippines	740	730	-1
Rest of world	13,974	12,263	-12
Total	**53,642**	**49,004**	**-9**

Data include bulk, intermediate, and consumer-oriented agricultural exports.
*Denotes a record-high export value.

continued to grow, gaining 5 percent to a record $1.6 billion, with strong demand for U.S. hardwoods (often for re-export as furniture back to the States). Sales to the European Union were off 11 percent, but sales were up 10 percent to Mexico and 38 percent to South Korea.

Seafood Exports Show Solid Gains

After a 3-year decline, foreign sales of U.S. fishery products increased a solid 19 percent to $2.6 billion in fiscal 1999, recovering nearly half the value lost since 1995. Although all major product categories registered increases, a recovery in salmon had the largest impact. Exports of U.S. whole/eviscerated salmon climbed 43 percent, mainly due to a larger Alaskan harvest.

Japan, the dominant market for salmon, also accounted for most of the $102-million increase in U.S. fish egg exports. For crabs and crabmeat, record sales to China (up 316 percent to $20 million) and Canada were key factors. Fiscal 1992 remains the decade's high point, when U.S. seafood product exports totaled $3.3 billion.

International Trade Agreements

In the area of trade policy, FAS is an active and effective advocate for U.S. agricultural exports. FAS works closely with other government agencies, including the Office of the U.S. Trade Representative (USTR), to ensure that the trade interests of U.S. producers and processors are protected. For example, FAS played an instrumental role in ensuring that the Uruguay Round Trade Agreement, signed in 1994, led to lower tariffs and elimination of import bans on agricultural products in over 130 countries. The final agreement also included disciplines on market access, export subsidies, and trade-distorting production subsidies. FAS' broad trade policy focus now is to monitor and enforce this agreement and others, such as the North American Free

Table 7-5.

U.S. Wood Product Exports, FY 1998-99

	FY 1998	FY 1999	1998-99 change
Commodity	*—$ million—*		*Percent*
Logs & chips	1,711	1,716	0
Lumber			
Hardwood	1,240	1,322	+7
Softwood/treated	768	786	+2
Panel products	1,026	918	-11
Other	1,264	1,226	-3
Total	**6,009**	**5,968**	**-1**

Table 7-6.

U.S. Seafood Product Exports, FY 1998-99

	FY 1998	FY 1999	1998-99 change
Commodity	*—$ million—*		*Percent*
Salmon			
Whole/eviscerated	246	353	+43
Canned	140	145	+4
Roe & urchin (fish eggs)	270	372	+37
Surimi (fish paste)	270	288	+7
Crab/crabmeat	120	151	+26
Other	1,125	1,272	+13
Total	**2,172**	**2,581**	**+19**

Trade Agreement (NAFTA), while we begin new negotiations to further expand opportunities for American agricultural exports. These new negotiations include the Free Trade Area of the Americas and a new round of World Trade Organization (WTO) multilateral agricultural negotiations during 2000.

The vast majority of the thousands of individual commitments made by our trading partners are being implemented faithfully and on time. To ensure that commitments are fulfilled, FAS works with all interested parties to help identify apparent violations and address them at the appropriate level. In addition to working with the USTR, FAS works closely with USDA agencies such as the Animal and Plant Health Inspection Service and the Food Safety and Inspection Service to field a team with the technical and policy experience needed to resolve problems. This team advocates U.S. export interests as it participates in the day-to-day activities of multilateral organizations such as the CODEX Alimentarius Committee in the Food and Agriculture Organization and the WTO Committees on Agriculture, and Sanitary and Phytosanitary Standards. These groups help develop international standards that affect trade in agricultural products and monitor compliance with existing trade agreements.

FAS is constantly acting as an advocate for U.S. agriculture exports in our relations with foreign countries. In recent years, for example, FAS has ensured that the Philippines honors its WTO commitments to import pork and poultry, that Korea opens its market for oranges, and that most countries not block imports of U.S. wheat after karnal bunt was discovered on wheat from Arizona and New Mexico. These and many other issues were resolved without initiating a formal WTO legal process, but rather by using bilateral consultations and regular meetings of the WTO committees. FAS has also used the WTO dispute settlement process to successfully challenge several foreign unfair trade practices, including the European Union's hormone ban, Japan varietal testing requirements, and Canada's dairy export subsidies. FAS also represents U.S. agriculture in negotiating with countries seeking membership in the WTO. The United States and Taiwan signed a market access agreement that has Taiwan lifting its import bans and allowing access for U.S. pork, poultry, and variety meats. Upon Taiwan's accession to the WTO, Taiwan will cut tariffs and open tariff-rate quotas on a range of agricultural products. In November 1999, the United States and China signed in Beijing a comprehensive bilateral trade agreement under which China committed to opening its agricultural import market and eliminating export subsidies upon its accession to the WTO.

Food Assistance Programs

Within USDA, the Foreign Agricultural Service is the leader in developing and executing a number of food assistance activities such as Public Law (P.L.) 480 Title I, Food for Progress, and Section 416(b). These programs are designed to help developing nations make the transition from concessional financing and donations to cash purchases. The U.S. Agency for International Development (USAID) is responsible for administering Titles II and III of P.L. 480.

P.L. 480 Title I—The objectives of the P.L. 480 Title I concessional credit program include providing food assistance to targeted developing countries and promoting the development of future markets in these countries. The program promotes market development by encouraging importers in the recipient country to become familiar with U.S. trade practices and to establish long-term trade relationships. The program is managed to promote the recipient country's transition to commercial trade by gradually reducing the concessionality of the program, eliminating ocean freight financing, and graduating countries from Title I to the more commercial CCC export credit guarantee program. Title I funds may also be used to support the **Food for Progress (FFP)** program, which is a grant program designed to assist countries working to make the transition to more market-oriented economies. Attention is given to shifting countries from Title I/FFP grant funding to regular Title I long-term concessional credit terms.

Fiscal year activities continued to focus on graduation; however, several Title I programs were initiated to address particular needs such as supporting recovery efforts for Central America following the devastation of Hurricane Mitch and providing commodities to Russia to ensure adequate food and feed supplies following the financial crisis. Additional program efforts also resulted in broadening the geographi-

cal base in the private voluntary organization (PVO) portion of the Food for Progress program to include, for example, a greater participation in Africa consistent with the President's African Initiative.

In fiscal year 1999, Title I and Title I-funded Food for Progress agreements were signed for 2.2 million metric tons of commodities valued at about $656.1 million. Of this, about 1.4 million metric tons of commodities valued at about $507.6 million were programmed to Russia as part of the food assistance package announced by the Secretary of Agriculture on November 6, 1998. Ocean freight financing and ocean freight grants totaling $80.2 million were also provided to ship these commodities to Russia under the food assistance package.

In addition to FFP programs carried out with P.L. 480 Title I funds, the funds and facilities of the Commodity Credit Corporation may also be used to support FFP programming. In the case of these programs, PVO's monetize the commodities received under an agreement with CCC to generate local currencies to fund development projects. In fiscal year 1999, USDA continued programming in countries beyond the republics of the former Soviet Union to include Africa, Latin America, and Asia. Programs were planned with U.S. PVO's for projects in 21 countries totaling about 164,000 tons of commodities with a value of about $71 million.

Under the **Title II** emergency and private assistance donations program, administered by the USAID, $28 million can be provided as overseas administrative support. For fiscal year 1999, Title II activities valued at almost $950 million moved a total of about 1.9 million metric tons and assisted more than 45 million beneficiaries in 57 countries and two regions (the Sahel and South Balkans). Funding for Title II increased slightly over the fiscal year 1998 levels, with spending on emergency programming ($513 million) continuing to exceed that of development (non-emergency) programming ($435 million).

USAID-administered **Title III** activities totaled $21.7 million in fiscal year 1999 and moved over 116,000 metric tons of commodities to three countries: Ethiopia and Mozambique in Africa, and Haiti in Latin America/Caribbean.

The **Section 416(b)** program allows for the donation of surplus commodities, made available through CCC stocks, to assist needy people overseas. In fiscal year 1999, approximately 5.5 million metric tons valued at about $794 million were programmed under Section 416(b) including over 5.0 million metric tons of wheat and wheat products under the President's special food aid initiative. These commodities were purchased by CCC under section 5(d), its surplus removal authority. Of the 5.5 million metric tons programmed in fiscal year 1999, about 1.6 million were donated to the U.N. World Food Programme (WFP) to be used in WFP emergency operations, protracted relief and recovery operations, and development projects. Operation and project beneficiaries included refugees, the internally displaced, and the hungry in poor countries and locations such as Ethiopia, Kosovo, and North Korea. The balance of about 3.9 million metric tons was programmed through government-to-government agreements and agreements with PVO's.

Commercial Export Credit Guarantee Programs

The primary objective of the credit guarantee programs is to improve the competitive position of U.S. agricultural commodities in international markets by facilitating the extension of export credit to middle-income countries that do not have access to adequate commercial credit. These CCC programs encourage U.S. lenders (typically commercial banks) to extend credit which is used by overseas customers to pay U.S. exporters. Increasing these guarantee programs supports the involvement of foreign private sector banks and private sector importers in commercial trade transactions with the United States.

The GSM-102 program guarantees repayments of short-term credits (90 days to 3 years) extended by U.S. financial institutions to eligible banks in countries that purchase U.S. farm products. For fiscal year 1999, GSM-102 allocations of about $5.1 billion were announced to 24 countries and 11 regional groupings, including the Andean, Baltic, Central American, Central Europe, East Africa, East Caribbean, Southeast Asia, Southeast Europe, Southern Africa, West African, and West Caribbean regions. Under this availability, GSM-102 registrations totaled about $3.0 billion for exports to 13 countries and 8 regions.

The GSM-103 program is designed to help developing nations make the transition from concessional financing to cash purchases. Guarantees issued under the GSM-103 program can cover financing periods of more than 3 and up to 10 years. For fiscal year 1999, $377 million in intermediate credit guarantees were made available to 12 countries and two regions—the Central America and Southern Africa regions. Under this availability, GSM-103 registrations totaled $44.2 million of U.S. agricultural exports to five countries and one region.

The Supplier Credit Guarantee Program (SCGP) provides export credit guarantees for sales financed by foreign importers rather than financial institutions. Under the program, CCC guarantees a portion of payments due from importers under short-term financing (up to 180 days) that exporters have extended directly to importers for the purchase of U.S. agricultural commodities and products. The program initially targeted only high-value and value-added products that are sold in smaller size export transactions. However, in fiscal year 1998, bulk commodities were added and additional countries were programmed, which greatly increased program usage and resulted in registrations of more than $18 million, a 21-percent increase over fiscal year 1997. For fiscal year 1999, allocations under the SCGP totaled $361 million in coverage for sales to 12 countries and 8 regions, including the Andean, Baltic, Central America, Central Europe, East Africa, East Caribbean, Southeast Asia, and Southeast Europe regions. Under the announced fiscal year 1999 availability, registrations totaled $46.02 million.

The Facilities Guarantee Program was introduced in fiscal year 1998 as a pilot program. This new program is designed to provide payment guarantees to facilitate the financing of manufactured goods and services exported from the United States to improve or establish agriculture-related facilities in emerging markets. By supporting such facilities, USDA intends to enhance sales of U.S. agricultural commodities and products to emerging markets where the demand for them may be constricted due to

inadequate storage, processing, or handling capabilities. Repayment terms range from 1 to 10 years. In fiscal year 1999, USDA continued to expand its available credit guarantee lines for the program. For example, fiscal year 1999 is the first year that the program has been made available for certain African countries. Moreover, USDA has increased its efforts to promote the program to the U.S. and overseas trade and to educate them about how the program works. Although no credit guarantees for facilities have been finalized to date, USDA anticipates increased interest and participation once the program becomes better known and established.

Export Assistance Programs

The Export Enhancement Program (EEP), announced by USDA on May 15, 1985, operates under authority of the Agricultural Trade Act of 1978, as amended, the Uruguay Round Agreement Act, and the Federal Improvement and Reform Act of 1996 (FAIR Act). The EEP permits USDA to provide bonuses to make U.S. commodities more competitive in the world marketplace and to offset the adverse effects of unfair trade practices or subsidies.

The FAIR Act sets maximum funding levels for the CCC to make available for the EEP each fiscal year through 2002 as follows: FY 1996, $350 million; FY 1997, $250 million; FY 1998, $500 million; FY 1999, $550 million; FY 2000, $579 million; FY 2001, $478 million; and FY 2002, $478 million.

EEP was made operational for fiscal year 1999. Fiscal year 1999 bonuses of about $1.4 million were awarded for 2,446 metric tons of frozen poultry.

Dairy Export Programs

The Dairy Export Incentive Program (DEIP) helps exporters sell certain U.S. dairy products at prices lower than the exporter's cost of acquiring them. The major objective of the program is to develop export markets for dairy products where U.S. products are not competitive because of the presence of subsidized products from other countries.

Section 148 of the FAIR Act focuses the DEIP on market development and provides for full authority and funding to reach the volume or spending limits that are consistent with U.S. obligations as a member of the World Trade Organization. The DEIP operates on a bid bonus system similar to EEP, with cash bonus payments.

The major markets assisted in fiscal year 1999 included Asia, the former Soviet Union, and Latin America, with $145 million in bonuses awarded on about 136,000 metric tons of dairy products.

Market Access Program

The Market Access Program (MAP) is authorized by Section 203 of the Agricultural Trade Act of 1978, as amended. The MAP is funded at $90 million annually for fiscal years 1996 through 2002 and is designed to encourage the development, maintenance, and expansion of foreign markets for U.S. agricultural commodities. Since its inception, the MAP has provided cost-share funds to approximately 800 U.S. companies, cooperatives, and trade organizations to promote their products overseas.

Foreign Market Development Program

The Foreign Market Development Program, also known as the cooperator program, fosters a trade promotion partnership between USDA and U.S. agricultural producers and processors, represented by nonprofit commodity or trade associations called cooperators. Projects generally fall into one of four categories: market research, trade servicing, technical assistance, and consumer promotions for the retail market. The cooperator program has helped support growth in U.S. agricultural exports by enlisting private sector involvement and resources in coordinated efforts to promote U.S. products to foreign importers and consumers around the world.

International Cooperation

The Foreign Agricultural Service is also responsible for coordinating, supporting, and delivering a diversified program of international agricultural cooperation and development. Its purpose is to enhance the competitiveness of U.S. agriculture, preserve natural resource ecosystems, and pursue sustainable economic development worldwide by mobilizing the resources of USDA and its affiliates throughout the entire U.S. agricultural community.

Food Security

Addressing the issues affecting the world's food supply, March 1999 saw the release of the *U.S. Action Plan on Food Security*. Coordinated by FAS, this report is the United States' official response to the 1996 World Food Summit, where 186 nations committed to reducing global undernutrition by half by 2015. Based on a partnership between government and civil society, the plan provides a road map for U.S. policy to overcome hunger, undernutrition, and food insecurity, both in the United States and abroad.

Scientific Collaboration

Short-term exchange visits between U.S. and foreign scientists, as well as longer term collaborative research, focus on minimizing threats to U.S. agriculture and forestry, developing new technologies, establishing systems to enhance trade, and providing access to genetic diversity essential to maintaining crops that are competitive in the world marketplace.

Technical Assistance

Sponsored by such international donor institutions as the U.S. Agency for International Development (USAID), the World Bank, regional development banks, specialized agencies of the United Nations, and private organizations, technical assistance programs are designed to increase income and food consumption in developing nations, help mitigate famine and disasters, and help maintain or enhance the natural resource base. Technical assistance is provided in areas such as food processing and distribution, plant and animal protection and quarantine, soil and water conservation, and forest management.

FAS' technical assistance contributed to hurricane recovery efforts in the Caribbean and Central America. When hurricanes hit with devastating impact in the fall of 1998, USDA took immediate actions to save lives and offer recovery assistance. FAS then coordinated long-term recovery assistance among nine USDA agencies to promote better environmental practices, food security, and food safety in the affected region. Using resources provided by the FAS-administered 416(b) Wheat Donations Program and USAID, USDA managed a small grants program for low-income farmers recovering from hurricane Georges in the Dominican Republic.

Training

Career-related training for foreign agriculturists provides long-term benefits to economic development, magnifying potential because those who learn teach others. Working collaboratively with USDA agencies, U.S. universities, and private sector companies and organizations, FAS designs and implements study tours, academic programs, and short-term courses and training in a variety of areas such as agribusiness, extension education, natural resource management, policy and economics, and human resource development. FAS' Cochran Fellowship Program helps expose senior- and mid-level specialists and administrators from developing, middle-income, and emerging market countries to U.S. expertise, goods, and services, in order to promote broad-based development that is mutually beneficial to continued scientific, professional, and trade relationships.

One example of FAS' training efforts is a regional workshop on biosafety and plant genetic engineering the agency co-sponsored with the Egyptian Ministry of Agriculture in February 1999. Designed to provide a forum for Middle East and Northern Africa policymakers to learn about biotechnology and biosafety issues, the workshop educated key officials, researchers, producers, consumers, and local media about the development and regulation of genetically modified organisms–an emerging focus of research and policy today. In support of the President's Africa Initiative, FAS conducted a May 1999 workshop on meeting international sanitary/phytosanitary standards. USDA officials worked with 37 counterparts from 17 Sub-Saharan African countries to discuss the importance of the next round of the WTO and Africa's role in implementing food safety and other sanitary/phytosanitary international standards.

Risk Management Agency

The mission of the Risk Management Agency (RMA) is to provide and support cost-effective means of managing risk for agricultural producers in order to improve the economic stability of agriculture. Crop insurance is USDA's primary means of helping farmers survive a major crop loss. For example, in 1999, nearly $31 billion in protection was provided on over 196 million acres through more than1.8 million policies; this is almost double the $13.6 billion protection on the 100 million acres insured in 1994.

Crop insurance helps farmers recover from crop losses, secure operating loans, and market a portion of their crop aggressively. In 1998, about two-thirds of the acreage planted to major U. S. crops was insured. During the 1999 crop year, Secretary Glickman took a big step in strengthening the crop insurance program when $400 million was set aside to offer farmers an estimated 30-percent reduction in the year's buy-up crop insurance premiums. Since the discount increased the number of insurance policies sold by 3 to 5 percent, the insured acreage is expected not only to increase, but coverage levels will be greater because of the increase in buy-up policies.

Crop insurance is widely available for major commodities such as corn, wheat, and cotton. Coverage is also available on a growing number of fruits, nuts, and vegetable crops. Nationally, more than 76 crops are insurable (counting all insurable varieties would greatly increase the number of crops insured), although not everywhere they are grown.

To help ensure greater farmer access to this valuable risk management tool, the Federal Crop Insurance Corporation (FCIC) Board of Directors (RMA's policymaking panel with private sector and public representation) expanded 35 crop programs into an additional 283 counties for the 1999 crop year. This expansion added to the national total of 28,437 county crop programs in 3,136 counties. Further, RMA continues to develop new pilot programs, such as insurance for cabbage, watermelons, and rangeland. By increasing the number and types of insurance plans, the program will help producers to better manage their production risks.

Crop insurance is sold and serviced by 17 insurance companies in conjunction with a network of 15,000 agents who provide frontline information on the latest programs available to producers. The effectiveness of this partnership is evident in the fact that virtually all indemnities are paid within 30 days of a claim. More information on RMA and its programs is available at: *http://www.act.fcic.usda.gov/*

Insurance Plans Available

Multiple-Peril Crop Insurance

Multiple-Peril Crop Insurance (MPCI) policies insure producers against losses due to unavoidable causes such as drought, excessive moisture, hail, wind, frost, insects, and disease. Indemnities are paid on the difference between what was produced and the yield guarantee. Yield guarantees are selected by the producer and generally range from 50 to 75 percent, but up to 85 percent of a producer's actual production history for some areas and crops. The prices used to pay losses are between 60 and 100 percent of the commodity price established annually by RMA.

Group Risk Plan

The Group Risk Plan (GRP) policies use a county index as the basis for determining a loss. When the county yield for the insured crop, as determined by USDA's National Agricultural Statistics Service (NASS), falls below the trigger level chosen by the farmer, an indemnity is paid. Yield levels are available for up to 90 percent of the expected county yield. GRP protection involves less paperwork and costs less

than the farm-level coverage described above. However, individual crop losses may not be covered if the county yield does not suffer a similar level of loss.

Revenue Insurance Plans

Revenue Insurance policies include three plans: Crop Revenue Coverage, Income Protection, and Revenue Assurance. Revenue policies are different from standard MPCI policies in that they provide farmers with a measure of price risk protection in addition to covering yield loss. Two of the policies, Crop Revenue Coverage and Revenue Assurance, were developed by private-sector insurance companies. The Income Protection pilot was developed by RMA. These policies guarantee a level of revenue that is determined differently by each of the policies. Indemnities are paid when any combination of yield and price results in revenue that is less than the revenue guarantee.

Adjusted Gross Revenue Plan

In its first year of testing in 1999, the Adjusted Gross Revenue (AGR) pilot insurance plan, a nontraditional whole farm risk management tool, provides an insurance safety net for multiple agricultural commodities in one insurance product. The plan uses a producer's historic Schedule F tax form information to calculate a level of guaranteed revenue for the insurance period. Qualifying producers can choose the 65, 75, or 80 percent coverage level, and all levels have a 75-percent payment rate.

Dairy Options Pilot Program (DOPP)

RMA currently operates the innovative Dairy Options Pilot Program (DOPP) to help dairy producers protect their income against the risk of falling milk prices. During each round of DOPP, producers in selected pilot counties receive training in the use of futures and options as price risk management tools. Within program guidelines, they may then purchase dairy put options (right to sell) through futures brokers registered with U.S. exchanges. When prices fall, the value of put options increase, thereby protecting the value of at least a portion of the producer's dairy production. USDA assists participating farmers by funding 80 percent of the cost of the options and by paying $30 per contract toward the commission charged by the broker.

Outreach

RMA is intensifying its efforts to reach beginning, small, traditionally underserved, and limited-resource farmers. Some highlights of these efforts include:

- Training and providing technical assistance in risk management with community-based organizations, 1890 land-grant institutions and 1994 tribal colleges, through partnerships and funding of 17 cooperative agreements.
- Funding development of risk management curriculums to meet the needs of American Indian agricultural businesses. Instructional material will be delivered through 29 tribal colleges.
- Improving the risk management skills of Hmong and Hispanic farmers in California by funding risk management training.

- Creating new policies—such as those for sweet potatoes and rangeland—to meet the needs of minority farmers. Many new vegetable and fruit policies will be tested in pilot programs in the next few years.
- Partnering with the National FFA Foundation to produce risk management videos and teaching materials.
- Providing computers with current nursery program software to the Florida Korean Nurserymen Association and local Farm Service Agency county offices. The software will simplify the inventory reporting requirements under the nursery policy.

Risk Management Education

Current farm policy increases the risk borne by producers. To help them acquire the risk management skills needed to compete and win in the global marketplace, RMA is leading a risk management education initiative. This initiative leverages government funds for education with the resources of public and private-sector partners to find improved risk management strategies, develop educational curricula and materials, and train producers in effective use of risk management tools.

RMA facilitates local training with the help of extension specialists and private-sector partners. The initiative is a cooperative effort between RMA; USDA's Cooperative State Research, Education, and Extension Service and National Office of Outreach; and the Commodity Futures Trading Commission.

RMA is also helping to make information on risk management more accessible to farmers and educators by funding the National Ag Risk Education Library, a powerful Internet resource developed by the Center for Farm Financial Management at the University of Minnesota: *http://www.agrisk.umn.edu/*

For More Information

Farm Service Agency

Director, Public Affairs, Legislative Liaison, and Executive Secretariat
Tade Sullivan
Rm 3615-S
Washington, DC 20250
202-720-3865
FAX 202-720-4034
tade_sullivan@wdc.fsa.usda.gov

Public Affairs Branch Chief
Eric L. Parsons
Rm 3624-S
Washington, DC 20250
202-720-7809
FAX 202-690- 2828
eric_parsons@wdc.fsa.usda.gov

Communications Services Section Chief
Danniel W. Stuart
Rm 3633-S
Washington, DC 20250
202-690-0474
FAX 202-690- 2839
dann.stuart_@wdc.fsa.usda.gov

Field Services Section Head
Greg Hawkins
Rm 3621-S
Washington, DC 20250
202-720-8768
FAX 202-690- 2828
greg_hawkins@wdc.fsa.usda.gov

FOIA Coordinator
Diane Korwin
Rm 3623-S
Washington, DC 20250
202-720-5534
FAX 202-690- 2828
diane_korwin@wdc.fsa.usda.gov

Farm Service Agency State Public Affairs Contacts

CA
Erica Szlosek
430 G Street #4161
Davis, CA 95616-4161
530-792-5537
FAX 530-792-5555
Erica_Szlosek@wdc.fsa.usda.gov

GA
Cynthia Valles
355 E. Hancock Avenue
Stop 107
Athens, GA 30601- 2775
706-5463177
FAX 706-546-2151
Cynthia_Valles@wdc.fsa.usda.gov

IA
Bruce Cordes
10500 Buena Vista Court
Des Moines, IA 50322
515-254-1540 x 602
FAX 515-254-1573
Bruce_Cordess@wdc.fsa.usda.gov

MN
Jim Meisenheimer
400 Agribank Building
375 Jackson Street
St Paul, MN 55115
651-602 7719
FAX 651-602-7743
Jim_Meisenheimer@wdc.fsa.usda.gov

MS
David Reagan
6310 I-55 North
Jackson, MS 39211
601-965 4774 x108
FAX 601-965-4184
David_Reagan@wdc.fsa.usda.gov

OH
Mike Kauffman
200 N High Street
Room 540 Federal Building
Columbus, OH 43215
614-255-2500
FAX 614- 255-2542
Mike_Kauffman@wdc.fsa.usda.gov

SD
Kathy Lindquist
200 4th St SW
Room 308, Federal Building
Huron, SD 57350-2478
605-352-1163
FAX 605-352-1195
Kathy_Lindquist@wdc.fsa.usda.gov

WA
Scott Hallett
West 316 Boone Avenue
Rock Pointe Tower, Suite 568
Spokane, WA 99201-2350
509-323-3002
FAX 509-323-3074
Scott_Hallett@wdc.fsa.usda.gov

WI
Susan Hunter
Madison, WI 53719
6515 Watts Road
608-276-8732 x141
FAX 608-271-9425
Susan_Hunter@wdc.fsa.usda.gov

—Information on FSA can also be found on the FSA Home Page at www.fsa.usda.gov

Foreign Agricultural Service

Director, Information Div.
Maureen Quinn
Rm 5074-S
Washington, DC 20250
202-720-7115
FAX 202-720- 1727
quinn@fas.usda.gov

Deputy Director
Sally Klusaritz
Rm 5074-S
Washington, DC 20250
202-720-3448
klusaritz@fas.usda.gov

Team Leader
Lynn Goldsbrough
Rm 5713-S
Washington, DC 20250
202-720-3930
FAX 202-720- 3229
goldsbrough@fas.usda.gov

Team Leader
Judy Goldich
Rm 5084-S
Washington, DC 20250
202-720-0328
FAX 202-720-1727
goldich@fas.usda.gov

Freedom of Info Act Officer
Donald Washington
Rm 5709-S
Washington, DC 20250
202-720-3101
FAX 202-720-3229
washington@fas.usda.gov

Risk Management Agency

Director of External Affairs
Pat Engel
Rm 3058-S
Washington, DC 20250
202-720-7956
FAX 202-690-2002
Pat_Engel@WDC.USDA.GOV

Director, Regulatory
Diana Moslak
Rm 6624-S
Washington, DC 20250
202-720-2832
FAX 202-690-5879
Diana_Moslak@WDC.USDA.GOV

Dir, Claims&Underwriting Srvcs
Mike Hand
Rm 6749-S
Washington, DC 20250
202-720-3439
FAX 202-690-2540
MHAND@WDC.USDA.GOV

Freedom of Info Act Officer
Donna Bassett
Rm 6606-S
Washington, DC 20250
202-690-5701
FAX 202-690-5890
Donna_Bassett@WDC.USDA.GOV

8. Food, Nutrition, and Consumer Services

Food and Nutrition Service

Nutrition is one of USDA's central missions. The Food and Nutrition Service (FNS) administers USDA's domestic nutrition assistance programs, with the mission of reducing hunger and food insecurity by providing children and needy families better access to food, a healthful diet, and nutrition education.

USDA has elevated nutrition and nutrition education to top priorities in all its programs. Rather than simply providing food, FNS also works to empower program participants with knowledge of the link between diet and health.

At the same time, USDA is committed to ensuring that the programs operate accurately and efficiently. FNS works closely with the States to ensure that benefits are received only by those who are eligible, and to catch and punish people who seek to abuse the programs for their own gain.

FNS works in partnership with the States in all its programs. States determine most administrative details regarding participant eligibility and distribution of nutrition benefits, and FNS provides funding to cover some of the States' administrative costs.

For FY 2000, the total appropriation for the nutrition assistance programs is $35 billion, nearly two-thirds of the entire USDA budget.

Overall, the nutrition programs reach one out of every six people living in America, and touch every community in the United States. Most of the programs are directed at low-income people or school children. They include:

- The Food Stamp Program
- The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC)
- The National School Lunch Program
- The School Breakfast Program
- Team Nutrition
- The Emergency Food Assistance Program
- The Child and Adult Care Food Program
- The Commodity Supplemental Food Program
- The Summer Food Service Program
- The Special Milk Program
- The Nutrition Program for the Elderly
- The Food Distribution Program on Indian Reservations
- The WIC Farmers Market Nutrition Program
- The Nutrition Assistance Program in Puerto Rico and the Pacific Islands

FNS is also the primary Federal agency that delivers food assistance in response to domestic natural disasters and other crises. The Food, Nutrition, and Consumer Services mission area also includes the Center for Nutrition Policy and Promotion.

Additional information on FNS and its programs can be found on the World Wide Web at *www.fns.usda.gov*.

■ ***Nutrition Program Fact:***
Determining eligibility: Many of USDA's nutrition programs use household income as a guideline for program eligibility. Depending on the program rules, household income of 100 percent, 130 percent, or 185 percent of the Federal poverty level may be used to determine levels of eligibility. As of June 30, 1999, 100 percent of the poverty guideline is $16,700 a year for a family of four; 130 percent is $21,710 a year; and 185 percent is $30,895 a year. Federal poverty guidelines are established by the Office of Management and Budget and are updated annually by the U.S. Department of Health and Human Services.

■ ***Nutrition Program Fact:***
FNS was established August 8, 1969, and celebrated its 30th anniversary in 1999. But many of the nutrition programs had their origins at USDA long before FNS existed as a separate agency. The predecessor of the modern Food Stamp Program was the Food Stamp Plan, which originated in 1939. The Food Distribution Program on Indian Reservations evolved from the Needy Family Program, which helped hungry Americans during the Depression era. USDA also distributed surplus food for use in school meals during the 1930's.

The Food Stamp Program

The Food Stamp Program is the cornerstone of USDA's nutrition assistance programs. The program helps low-income households increase their food purchasing power and their choices for a better diet. It is the primary source of nutrition assistance for low-income households in the United States. Initiated as a pilot program in 1961 and made permanent in 1964, the program issues monthly allotments of coupons that are redeemable at retail food stores, or provides benefits through Electronic Benefit Transfer (EBT).

The Food Stamp Program serves the most needy among the Nation's population. In Fiscal Year 1997, more than half of all food stamp participants were children; more than 90 percent of all food stamp households had incomes below the Federal poverty level; and 39 percent had incomes that were half or less of the poverty level.

Marked decline in food stamp participation in recent years has led to a concern that some people who are eligible for benefits may not realize they are eligible, especially working poor households who may have lost benefits under other programs. FNS launched its food stamp information initiative in 1999 to ensure that all eligible people know they are eligible and know how to get benefits.

Increasingly, paper food stamp coupons are being replaced by electronic benefit transfer, or EBT, a computerized system in which participants use magnetic strip cards to access their food stamp accounts at the point of sale. As of October 1999, 40 States and the District of Columbia were operating the EBT system for all or part of their food stamp issuance, and some were using it for other benefits programs as well. All other States were in some stage of EBT development.

The 1996 welfare reform law requires all States to implement EBT systems for food stamp issuance by 2002. Because it eliminates paper coupons and creates an electronic record of every food stamp transaction, EBT is a useful tool in improving program delivery and in reducing certain types of food stamp fraud and trafficking.

EBT is only one component of FNS' commitment to Food Stamp Program integrity. The agency works closely with the States to ensure that they issue benefits in the correct amounts, and only to people who are eligible. EBT has enhanced FNS' ability to catch those who abuse the program, and penalties have been increased for people who are caught. In addition, FNS now has broader authority to review the performance of food retailers who participate in the program, and to quickly remove those who fail to follow program rules.

USDA also provides educational materials to help States integrate nutrition into the Food Stamp Program and to help food stamp recipients make healthier food choices as they use their benefits.

Eligibility: Food stamp eligibility and allotments are based on household size and income, assets, and other factors. A household's gross monthly income cannot exceed 130 percent of the Federal poverty guidelines, and its net income cannot exceed 100 percent of the guidelines (though households with elderly or disabled members are not subject to the gross income limit). Illegal aliens are not eligible to receive food stamp benefits. The welfare reform law of 1996 excluded many legal aliens from eligibility as well, though Congress later modified those provisions and restored benefits to many who were excluded under the 1996 law. The welfare reform law also limited able-bodied adults without dependents who are working or in job training to 3 months of benefits in a 36-month period.

Benefits: The level of benefits a household receives is based on its household income. Average monthly benefits were about $72 per person in 1999. Households with no countable net income receive the maximum monthly allotment of food stamps—$419 for a household of four in FY 1999. The allotment is based on the cost of the Thrifty Food Plan, a low-cost model food plan. The Food Stamp Program served an average of 18.2 million people each month in FY 1999.

Funding: The total Food Stamp Program appropriation was $21.1 billion in FY 1999.

■ ***Nutrition Program Fact:***
How EBT works: Electronic Benefit Transfer (EBT) is a computerized system that allows food stamp customers to use a plastic debit card similar to a bank card to access their food stamp benefits. Eligible recipients have an account established for their monthly benefits. At the grocery checkout, they present the card, which is used to debit their food stamp account for the amount of eligible purchases. The funds are automatically transferred to the retailer's account, and an electronic record is made of the transaction. No money and no food stamps change hands.

The National School Lunch Program

The National School Lunch Program (NSLP) is a federally assisted meal program operating in more than 96,000 public and nonprofit private schools and residential child care institutions. It provides nutritionally balanced, low-cost or free lunches and afterschool snacks to more than 27 million children each school day.

The NSLP is usually administered by State education agencies, which operate the program through agreements with local school districts. FNS administers the program at the Federal level. School districts and independent schools that choose to take part in the lunch program receive cash reimbursement and donated commodity foods from USDA for each meal they serve. In return, they must serve meals that meet Federal nutrition requirements, and they must offer free and reduced-price lunches to eligible children. School food authorities can also be reimbursed for snacks served to children through age 18 in after-school educational or enrichment programs.

FNS's Team Nutrition initiative, launched in 1994, was the first major reform of the school lunch program since it was established in 1946. Team Nutrition updated nutrition standards so that all school meals will meet the recommendations of the Dietary Guidelines for Americans. Team Nutrition also provides training and technical support for school nutrition and food service staffs, and nutrition education materials for children and families.

USDA has placed special emphasis on improving the quality of commodity foods donated to the National School Lunch Program. The Commodities Improvement Council promotes the health of school children by improving the nutritional profile of USDA commodities while maintaining USDA's support for domestic agricultural markets. Based on the council's recommendations, USDA has reduced the fat, sodium, and sugar content of commodities, and increased the variety of low-fat and reduced-fat products.

USDA has greatly increased the amount of fresh produce available to schools and is now offering unprecedented amounts and varieties of fresh fruit and vegetables. A cooperative project with the Department of Defense (DOD) has allowed USDA to increase the variety of produce available to schools by utilizing DOD's buying and distribution system. USDA is also exploring ways to connect schools to

small-resource farmers in their areas, to help them purchase fresh, local produce directly from the producers.

El**igibility:** Any child, regardless of family income level, can purchase a meal through the NSLP. Children from families with incomes at or below 130 percent of the Federal poverty level are eligible to receive free meals. Children from families with incomes between 130 and 185 percent of poverty are eligible for reduced-price meals. Children from families with incomes over 185 percent of poverty pay the full price, which is established by the local school food authority.

Benefits: Children receive meals free or at low cost because of USDA support for the school meals programs. Most of that support comes in the form of cash reimbursements to schools for meals served. USDA's per-meal reimbursement rates for the contiguous United States for school year 1999-2000 were $1.98 for free meals; $1.58 for reduced-price meals; and 19 cents for full-price meals. Reimbursement rates are slightly higher in Alaska and Hawaii. Schools may charge no more than 40 cents for a reduced-price meal. They set their own prices for full-price meals, though they must operate their meal services on a non-profit basis.

In addition to cash reimbursements, schools are entitled to receive commodity foods, called "entitlement" foods, at an annually adjusted per-meal rate (14.75 cents per meal in school year 1999-2000) for each meal they serve. Schools can receive additional commodities, known as "bonus" commodities, when these are available from surplus stocks purchased by USDA under surplus removal and price support programs. USDA commodities make up approximately 17 percent of the cost of the food served by the average school food authority. The rest of the food served is purchased locally by the school food authority.

Funding: For FY 2000, Congress appropriated $5.7 billion for the National School Lunch Program.

■ ***Nutrition Program Fact:***
The value of USDA commodity foods makes up only about 17 percent of cost of the foods that are served to children in the National School Lunch Program. Nonetheless, USDA provided more than 1 billion pounds of food, valued at more than $700 million, to schools in school year/fiscal year 1998-99.

The School Breakfast Program

The School Breakfast Program (SBP) provides cash assistance to States to operate nonprofit breakfast programs in schools and residential child care institutions. The program operates in more than 71,000 schools and institutions, serving a daily average of some 7.5 million children. It is administered at the Federal level by FNS. State education agencies administer the SBP at the State level, and local school food authorities operate it in schools.

Eligibility: Any child at a participating school may purchase a meal through SBP. Children from families with incomes at or below 130 percent of the Federal poverty level are eligible for free breakfasts. Children from families with incomes between 130 and 185 percent of the poverty level are eligible for reduced-price breakfasts. Children from families with incomes over 185 percent of poverty pay the full, locally established price for their breakfasts.

Benefits: Students receive their meals free or at low cost because USDA supports the School Breakfast Program with cash reimbursements for meals served. For school year 1999-2000, schools in the contiguous United States received reimbursements of $1.09 for a free meal; 79 cents for a reduced-price meal; and 21 cents for a full-price meal. As with the school lunch program, reimbursements are slightly higher in Alaska and Hawaii. Schools may charge no more than 30 cents for a reduced-price breakfast. Local schools set their own prices for full-price meals, but must operate on a non-profit basis.

Funding: For FY 2000, Congress appropriated $1.4 billion for the SBP.

■ ***Nutrition Program Fact:***
The vast majority of children who participate in the School Breakfast Program—about 85 percent—receive their meals free or at a reduced price. That compares to 57 percent of children who receive free or reduced-price meals in the National School Lunch Program. However, FNS promotes the benefits of healthy breakfast for all children, regardless of income status. Teachers have long reported that their students are more alert and perform better in class if they eat breakfast. FNS will initiate a series of pilot projects in school year 2000-2001 to evaluate the link between free breakfast for all children and improvement in academic performance.

Team Nutrition

FNS provides nutrition education through Team Nutrition. Team Nutrition provides schools with nutrition education materials and other support for children's nutrition programs such as the National School Lunch and School Breakfast Programs, and with technical support for food service professional staffs. It also provides nutrition education materials for USDA's other nutrition assistance programs.

Eligibility: All children participating in or eligible to participate in the USDA Child Nutrition Programs may receive nutrition education through Team Nutrition. Professional school food service staffs can also receive training and technical support.

Funding: In FY 2000, Congress appropriated $10 million for Team Nutrition.

The WIC Program

The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is a grant program for States, intended to improve the health of pregnant, postpartum, and breastfeeding women, and infants and children up to 5 years old, by providing supplemental foods, nutrition education, and access to health care. A few State agencies provide food directly to participants, but most States provide WIC vouchers that can be used at authorized food stores for approved foods.

WIC provides each State with a grant of funds to serve its most needy eligible population. Because of documented successes of the WIC program in improving the nutritional well-being of participants, it has received continuing political support, enabling it to expand to serve more eligible people. In FY 1999, WIC served an average of more than 7.3 million people each month.

Eligibility: To be eligible for WIC, an applicant must be a pregnant, breastfeeding, or postpartum woman, or an infant or child under age 5, and must meet State residency requirements, meet an income standard, and be determined by a health professional to be at nutritional risk. This nutrition evaluation is done at no cost to the applicant.

Benefits: In most States, WIC participants receive vouchers that allow them to purchase a monthly food package especially designed to supplement their diets. The foods provided are high in protein, calcium, iron, and vitamins A and C. WIC foods include iron-fortified infant formula and infant cereal; iron-fortified adult cereal; vitamin C-rich fruit or vegetable juice; eggs, milk, and cheese; and legumes such as peanut butter, dried beans, or peas. Special therapeutic formulas and foods are provided when prescribed by a physician for a specified medical condition.

The Food and Nutrition Service also encourages WIC mothers to breastfeed their babies whenever possible. Women who breastfeed their babies and do not receive infant formula for them receive an enhanced WIC food package that includes tuna, carrots, and extra juice, cheese, and legumes.

Funding: The appropriation for the WIC program in FY 2000 is $4 billion.

■ ***Nutrition Program Fact:***
In 1999, WIC was recognized for excellence in customer service by Vice President Gore's National Partnership for Reinventing Government. Among 30 high-impact Government programs, WIC's customer satisfaction rating was second only to the Head Start program. The American Customer Satisfaction Index is utilized to rate businesses. WIC's score compared favorably with businesses known for customer services, Nordstroms and Mercedes Benz.

■ ***Nutrition Program Fact:***
WIC celebrated its 25th anniversary in 1999. The first WIC site was opened in Pineville, KY, on January 15, 1974, as part of a 2-year pilot project. In 1975, the WIC program was established by public law as a permanent national health and nutrition program.

■ ***Nutrition Program Fact:***
WIC has been shown to be effective in improving the health of newborns and infants, as well as mothers. A 1990 USDA study of WIC and Medicaid costs in five States reported that every $1 spent on WIC prenatal care saved up to $3.13 in Medicaid costs in the first 60 days after birth.

■ ***Nutrition Program Fact:***
FNS requires all States to take bids from or negotiate with manufacturers for the best rebate on each can of WIC infant formula purchased. For FY 1999, infant formula rebates totaled about $1.4 billion nationwide.

■ ***Nutrition Program Fact:***
USDA estimates that WIC serves 46 percent of babies born in the United States.

The WIC Farmers' Market Nutrition Program

The WIC Farmers' Market Nutrition Program (FMNP) was established in 1992. The program has two goals: To provide fresh, nutritious, unprepared food, such as fruits and vegetables, from farmers' markets to WIC participants who are at nutritional risk; and to expand consumers' awareness and use of farmers' markets. This program, operated in conjunction with the regular WIC Program, is offered in 33 States, the District of Columbia, Guam, and four Indian tribal organizations.

Eligibility: Women, infants over 4 months old, and children who receive WIC program benefits, or who are WIC-eligible, may purchase foods at farmers' markets through the FMNP.

Benefits: Fresh produce can be purchased with FMNP coupons. State agencies may limit FMNP sales to specific foods that are locally grown to encourage participants to support the farmers in their own State.

Funding: Congress made up to $15 million available for FMNP under the FY 2000 WIC appropriation.

■ ***Nutrition Program Fact:***
Studies have shown that where the WIC Farmers' Market Nutrition Program has been available, WIC participants have consumed more fresh fruits and vegetables.

The Commodity Supplemental Food Program

The Commodity Supplemental Food Program (CSFP) is a program of grants to States, administered by FNS at the Federal level. CSFP provides commodity foods to supplement the diets of low-income infants; children up to the age of 6; pregnant, postpartum, and breastfeeding women; and persons 60 years of age and older.

CSFP operates in 22 States, the District of Columbia, and two Indian tribal organizations. USDA donates commodity foods to the State agencies for distribution, and provides funds to State and local agencies to cover certain administrative costs. The program served an average of more than 381,000 people each month in FY 1999.

Eligibility: State agencies that administer CSFP may establish a residency requirement and/or require applicants to be determined to be at nutritional risk in order to be eligible for program participation. To be income eligible, women, infants, and children must be eligible for benefits under existing Federal, State, or local food, health, or welfare programs, and must not currently be receiving WIC benefits. Elderly persons must meet a low-income standard.

Benefits: There are six food packages for different categories of participants. The food packages are not intended to provide a complete and balanced diet, but rather are supplements that are good sources of the nutrients often lacking in participants' diets.

Funding: The 2000 appropriation for CSFP is $88.3 million.

The Child and Adult Care Food Program

The Child and Adult Care Food Program (CACFP) provides healthy meals and snacks in child care centers, family day care homes, and adult day care facilities.

By reimbursing participating day care operators for a portion of the costs of eligible meals and snacks and providing them with USDA commodity food and nutrition information materials, CACFP helps ensure that children and adults in day care receive healthy meals. Family day care homes may be overseen by sponsoring organizations, which also receive reimbursements from USDA for their administrative expenses.

The program generally operates in child care centers, outside-school-hours care centers, family and group day care homes, and some adult day care centers. Homeless shelters that serve young children may also be eligible to participate. In return for Federal support, care providers in the CACFP must serve meals that meet Federal guidelines, and must offer free or reduced-price meals to eligible people. Child care centers can also be reimbursed for snacks served to children through age 18 in after-school educational or enrichment programs.

First authorized as part of a larger pilot project in 1968, the program was formerly known as the Child Care Food Program. It was made a permanent program in 1978, and the name was changed in 1989 to reflect the addition of an adult component. CACFP is administered at the Federal level by FNS. State agencies or FNS regional offices oversee the program at the local level.

In September 1999, CACFP provided meals to some 2.4 million children and more than 64,000 adults.

Eligibility: At child and adult day care centers, participants from families with incomes at or below 130 percent of the Federal poverty level may qualify for free meals; those from families with income between 130 percent and 185 percent of the poverty level may qualify for reduced-price meals; and those from families with income above 185 percent of the poverty level pay full price. For family day care homes, Congress instituted a two-tier system of reimbursements under the welfare reform law of 1996. Under this system, day care providers located in low-income areas, or whose own households are low income, are reimbursed at a single rate (tier 1 reimbursement) for meals served to enrolled children. Other providers are reimbursed at a lower rate (tier 2 reimbursement) unless they choose to have their sponsoring organizations identify children who are income eligible. Meals served to such income-eligible children are reimbursed at the higher tier 1 level.

Benefits: Children and adults who attend day care facilities receive nutritious meals and snacks. Care providers receive reimbursement for eligible meals and snacks. Family day care sponsoring organizations may receive reimbursement for their administrative costs.

Funding: Congress appropriated $1.7 billion for the CACFP in FY 1999.

■ ***Nutrition Program Fact:***
Congress in 1998 expanded reimbursement to provide snacks for educational and enrichment afterschool care programs for at-risk children through age 18. Funding for snacks in afterschool programs is provided through the National School Lunch Program and the Child and Adult Care Food Program.

■ ***Nutrition Program Fact:***
More than 170,000 family day care homes and 34,000 day care centers participated in the Child and Adult Care Food Program in Fiscal Year 1999.

The Summer Food Service Program

The Summer Food Service Program (SFSP) provides free meals to low-income children during school vacations.

SFSP was first created as part of a larger pilot program in 1968, and became a separate program in 1975. The SFSP served almost 2.3 million children a day during the summer of 1998.

The program is administered at the Federal level by FNS. Locally, it is operated by approved sponsors, which receive reimbursement from USDA for the meals they serve.

Sponsors provide meals at a central site such as a school or community center. All meals are served free.

The Summer Food Service Program operates in low-income areas where half or more of the children are from households with income at or below 185 percent of the Federal poverty guideline. Sites that primarily serve homeless children may participate regardless of location. Residential children's camps also may get reimbursement through the SFSP for meals served to income-eligible children.

Eligibility: Children age 18 and under, and people over age 18 who are determined by a State educational agency to be mentally or physically handicapped, and who participate in a school program for the mentally or physically handicapped, may receive meals through the Summer Food Service Program.

Benefits: At most sites, participants receive either one or two meals a day. Residential camps and sites that primarily serve children from migrant households may be approved to serve up to three meals per day.

Sponsors are reimbursed for documented operating and administrative costs.

Funding: Congress appropriated $298 million for the Summer Food Service Program in FY 1999.

> ■ ***Nutrition Program Fact:***
> *Some 27 million children eat school lunch every day when school is in session, and more than half of them receive their meals free or at a reduced price. The Summer Food Service Program offers those needy children nutritious food when school is not in session. However, only about 2.3 million children currently participate in the SFSP, in part because many communities do not sponsor the program.*

The Special Milk Program

The Special Milk Program (SMP) provides milk to children in schools and child care institutions that do not participate in other Federal meal service programs. The program reimburses schools for the milk they serve.

Schools in the National School Lunch or School Breakfast Programs may also participate in the SMP to provide milk to children in half-day prekindergarten and kindergarten programs where children do not have access to the school meal programs.

Expansion of the National School Lunch and School Breakfast Programs, which include milk, has led to a substantial reduction in the SMP since its peak in the late 1960's.

Eligibility: Any child at a participating school or kindergarten program can get milk through the SMP. Children may buy milk or receive it free, depending on the school's choice of program options. When local officials offer free milk under the program, any child from a family that meets income guidelines for free meals and milk is eligible.

Benefits: Participating schools and institutions receive reimbursement from the Federal Government for each half-pint of milk served. They must operate their milk programs on a nonprofit basis. They agree to use the Federal reimbursement to reduce the selling price of milk to all children.

Funding: Congress appropriated $17.2 million for the program in FY 2000.

> ■ ***Nutrition Program Fact:***
> *In 1999, more than 128 million half-pints of milk were served through the Special Milk Program.*

Nutrition Program for the Elderly

The Nutrition Program for the Elderly (NPE) helps provide elderly persons with nutritionally sound meals through meals-on-wheels programs or in senior citizen centers and similar settings.

The NPE is administered by the U.S. Department of Health and Human Services, but receives commodity foods and financial support from USDA under provisions of the Older Americans Act of 1965. USDA provided reimbursement for more than 20 million meals a month in FY 1998.

Eligibility: Age is the only factor used in determining eligibility. People age 60 or older and their spouses, regardless of age, are eligible for NPE benefits. There is no income requirement to receive meals under NPE.

Benefits: Each recipient can contribute as much as he or she wishes toward the cost of the meal, but meals are free to those who cannot make any contribution.

Under NPE, USDA provides cash reimbursements and/or commodity foods to organizations that provide meals through DHHS programs. Meals served must meet a specified percentage of the Recommended Dietary Allowances (RDA's) in order to qualify for cash or commodity assistance.

Funding: Congress appropriated $140 million for NPE for 2000.

> ■ ***Nutrition Program Fact:***
> *Indian tribal organizations may select an age below 60 for defining an "older" person for their tribes for purposes of eligibility for the Nutrition Program for the Elderly.*

The Food Distribution Program on Indian Reservations

This program provides monthly food packages to low-income families living on reservations, and to Native American families living near reservations. Many Native Americans participate in the Food Distribution Program on Indian Reservations (FDPIR) as an alternative to the Food Stamp Program if they do not have easy access to food stores. An average of 129,000 people received food through each month in 1999.

The program is administered at the Federal level by FNS in cooperation with State and tribal agencies. USDA provides food to the agencies, which are responsible for program operations such as storage and distribution, eligibility certification, and nutrition education.

The food packages distributed through FDPIR were updated in 1997 in a cooperative effort by USDA nutritionists, tribal leaders, and health advocates. Changes have made the food packages easier to use, and better serve the health needs and preferences of Native Americans. USDA also provides nutrition information in the monthly food package, with suggestions for making the most nutritious use of the commodity foods.

Eligibility: To participate in FDPIR, the household must have low income within program requirements, have assets within specified limits, and be located on or near an Indian reservation.

Benefits: USDA donates a variety of foods to help FDPIR participants maintain a balanced diet. These commodities include canned meats and fish products; vegetables, fruits, and juices; dried beans; peanuts or peanut butter; milk, butter, and cheese; pasta, flour, or grains; adult cereals; corn syrup or honey; and vegetable oil and shortening. Frozen chicken and ground beef are increasingly available as tribes are able to store and handle these products safely, and the 1997 review of food packages resulted in the addition of noodles, spaghetti sauce, crackers, reduced-salt soups and low-fat refried beans.

Through an interagency partnership with the Department of Defense and AMS, fresh fruits and vegetables are now available to Indian tribal organizations within the FDPIR.

Each participant receives a monthly package that contains a variety of foods. For FY 1999, the value of the monthly food package was about $31 per person.

Funding: Congress appropriated $75 million for FDPIR in FY 1999.

■ ***Nutrition Program Fact:***
A recipe book, Quick & Easy Commodity Recipes for the Food Distribution Program on Indian Reservations, was released for use by FDPIR participants in 1990. The book was developed as part of a 5-year nutrition education plan. USDA also distributes a series of nutrition and health fact sheets for FDPIR participants.

The Emergency Food Assistance Program

The Emergency Food Assistance Program (TEFAP) provides emergency food assistance to needy Americans through the distribution of USDA commodities. Under TEFAP, commodities are made available to States for distribution to organizations that provide them to low-income households for home consumption, and to organizations that use them in congregate meal service for the needy, including the homeless. Local agencies, usually food banks, shelters, and soup kitchens, are designated by the States to distribute the food.

TEFAP was first authorized in 1981 to distribute surplus commodities to households. Its aim was to help reduce Federal food inventories and storage costs while assisting the needy. The 1988 Hunger Prevention Act required the Secretary of Agriculture not only to distribute surplus foods, but also to purchase additional food for further distribution to needy households. Foods available vary depending on market conditions.

Eligibility: Each State sets its own income limits for household eligibility to receive food for home use. States can adjust the income criteria based on the level of need in order to ensure that assistance is provided only to those most in need.

No income test is applied to people who receive meals at soup kitchens and other congregate feeding sites that make use of TEFAP foods.

Benefits: TEFAP has provided many billions of pounds of food since its beginning. More than 1 billion pounds, valued at $846 million, were distributed at the program's height in 1987. In 1999, more than 361 million pounds of food, valued at more than $225 million, was distributed.

Funding: Congress appropriated $143 million for TEFAP in FY 2000.

The Nutrition Assistance Programs in Puerto Rico, American Samoa, and the Commonwealth of the Northern Mariana Islands

The Food Stamp Program in Puerto Rico was replaced in 1982 by a block grant program. American Samoa and the Northern Marianas in the Pacific also provide benefits under block grants. Eligibility: The territories determine eligibility and allotments for their programs based on household size, income, assets, and other factors.

Benefits: The territories provide cash and coupons to participants rather than food stamps or food distribution. The grant can also be used for administrative expenses or for special projects related to food production and distribution.

Funding: The appropriation for the NAP in Puerto Rico for FY 2000 was $1.3 billion. For the Pacific Islands, the appropriation was $10 million.

USDA Disaster Assistance

FNS is the primary agency responsible for providing Federal food assistance in response to domestic disasters such as fires, floods, storms, and earthquakes. FNS provides assistance through the Food Distribution Program and the Disaster Food Stamp Program.

Food Distribution Program

FNS can provide USDA-donated food assistance through State food distribution agencies. All States have stocks of USDA food on hand for use in their commodity programs for schools or needy people. These stocks can be released immediately for use in a disaster situation.

Upon request from a State, FNS will procure additional food to meet the needs of people affected by a disaster. Nearby States may be asked to release their stocks of USDA food to help feed disaster victims. State agencies then distribute the food to emergency shelters and other mass feeding sites operated by disaster relief agencies such as the American Red Cross.

The State may also request that food be made available for household distribution, if commercial channels of food supply are not available because of the disaster.

Disaster Food Stamp Program

When commercial channels of food supply have been restored following a disaster, a State may request approval from the Secretary of Agriculture to operate a Disaster Food Stamp Program. A Disaster Food Stamp Program may also be implemented following a Presidential disaster declaration under the Robert T. Stafford Disaster Relief and Emergency Assistance Act.

If approval is granted, FNS provides on-site guidance for establishing and operating the disaster program. FNS ensures that an adequate supply of food stamp coupons or EBT benefits are available. State and local officials are responsible for determining the eligibility of households to receive disaster food stamps, and for issuing the benefits.

> ■ ***Nutrition Program Fact:***
> *In fiscal year 1999, FNS provided approximately $13.2 million pounds of food to victims of natural disasters.*

Communications and Governmental Affairs

In 1999, the Office of Consumer Affairs merged with Public and Governmental Affairs to provide more coordinated support to FNS, consumer groups, and FNS program stakeholders. Communications and Governmental Affairs (CGA) advises the Under Secretary for Food, Nutrition, and Consumer Services on consumer and constituent issues and concerns, as well as governmental and public affairs.

CGA arranges periodic meetings, briefings, and roundtables on USDA and FNS policy for the public, consumer representatives, and program stakeholders. It provides public access to a wide range of USDA and FNS documents such as speeches, regulatory proposals, and studies, through the Internet and other electronic media, and it responds to consumer requests for assistance and information on USDA policy and procedures.

- ***Nutrition Program Fact:***
  How To Apply: People who want to apply for any of the nutrition assistance programs that FNS operates must do so through the appropriate State or local agency. In general, applicants for the largest programs should contact the following:
  - *Food Stamp Program: Contact the State welfare agency. Food stamp offices may be listed in the telephone book under "food stamps," "social services," "human services," or some similar term.*
  - *National School Lunch or School Breakfast Program free and reduced-price meals: Contact the neighborhood school or local school district.*
  - *WIC program: Contact State or local public health offices.*

  For programs not listed above, State and local welfare agencies, health departments, or education agencies can provide information about what programs are available and how and where to apply. Local Congressional representatives' offices may also be able to provide assistance in contacting the appropriate agency.

The CGA director reports to the Under Secretary for Food, Nutrition, and Consumer Services, and receives managerial and administrative support from FNS.

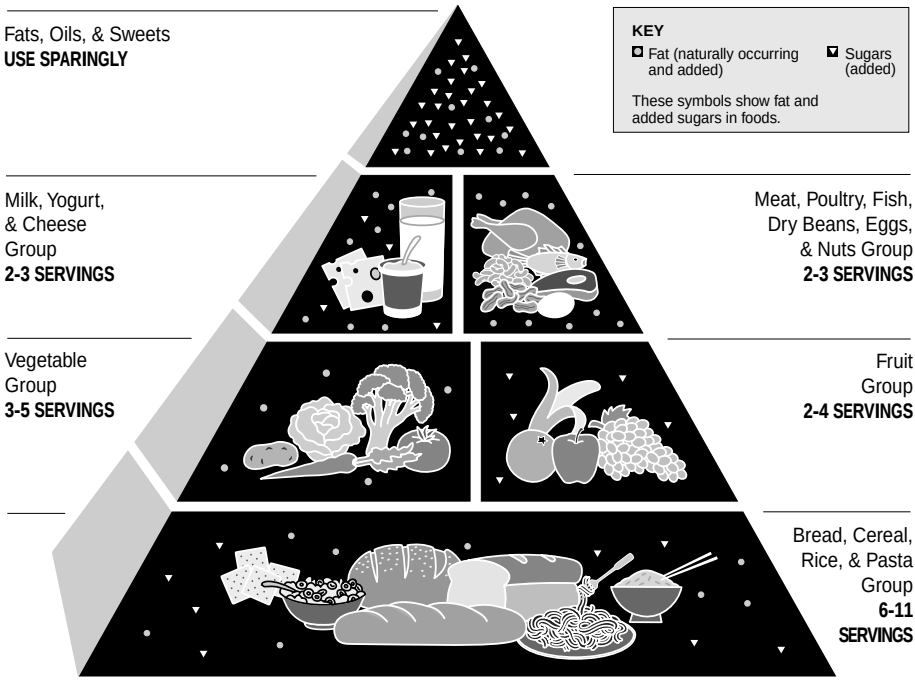
Center for Nutrition Policy and Promotion

The Center for Nutrition Policy and Promotion was established in December 1994 to provide direction and coordination for USDA's nutrition research and policy activities. The Center's mission is to enhance the nutritional status of Americans by linking scientific research to the nutritional needs of the American consumer. Nutrition research is translated into information and materials for nutrition educators and policy makers, health professionals, private companies, and consumers to increase public knowledge and understanding of the importance of nutrition and how to improve diet quality.

The Center is best known for the *Dietary Guidelines for Americans*, *The Food Guide Pyramid*, *The Food Guide Pyramid for Young Children*, *The Healthy Eating Index*, and *Expenditures on Children by Families*. These and other products developed by the Center are available at the Center's web site at *www.usda.gov/cnpp*.

The Center is an independent resource in USDA which reports to the Under Secretary for Food, Nutrition, and Consumer Services and works cooperatively with other parts of the Department to provide strategic planning and coordination for education and nutrition policy. The Center receives administrative support from FNS. Its funding for FY 1999 is $2.5 million.

The Food Guide Pyramid



Source: U.S. Department of Agriculture/U.S. Department of Health and Human Services

WHAT COUNTS AS A SERVING?

Food Groups

Bread, Cereal, Rice, and Pasta		
1 slice of bread	1 ounce of ready-to-eat cereal	1/2 cup of cooked cereal, rice, or pasta

Vegetable		
1 cup of raw leafy vegetables	1/2 cup of other vegetables, cooked or chopped raw	3/4 cup of vegetable juice

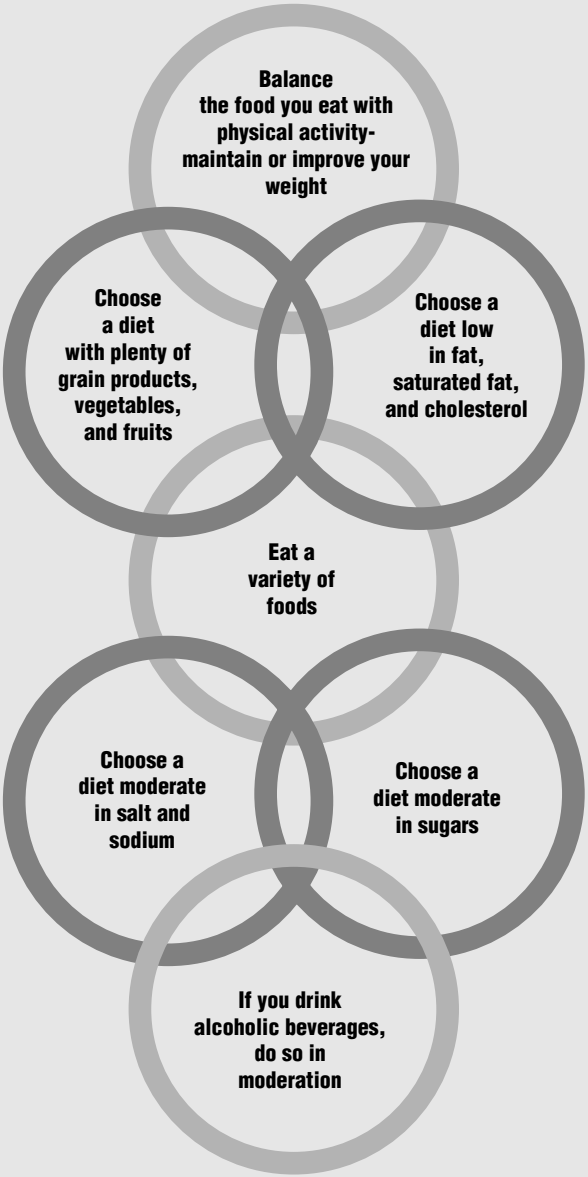
Fruit		
1 medium apple, banana, orange	1/2 cup of chopped, cooked, or canned fruit	3/4 cup of fruit juice

Milk, Yogurt, and Cheese		
1 cup of milk or yogurt	1-1/2 ounces of natural cheese	2 ounces of process cheese

Meat, Poultry, Fish, Dry Beans, Eggs, and Nuts	
2-3 ounces of cooked lean meat, poultry, or fish	1/2 cup of cooked dry beans or 1 egg counts as 1 ounce of lean meat. 2 tablespoons of peanut butter or 1/3 cup of nuts count as 1 ounce of meat.

Nutrition and Your Health:

Dietary Guidelines for Americans



U.S. Department of Agriculture
U.S. Department of Health and Human Services

For More Information:

Food and Nutrition Service

Director, Office of Communications and Governmental Affairs
Joyce Willis
3101 Park Center Dr.,#805PC
Alexandria, VA 22302
703-305-2281
FAX 703-305-2312
joyce.willis@fns.usda.gov

Deputy Director, Office of Communications and Governmental Affairs
Mike Haga
3101 Park Center Dr., #926PC
Alexandria, VA 22302
703-305-2039
mike.haga@fns.usda.gov

Director, Governmental Affairs
Frank Ippolito
3101 Park Center Dr., #806PC
Alexandria, VA 22302
703-305-2010
FAX 703-305-2464
frank.ippolito@fns.usda.gov

Director, Public Information
Jean Daniel
3101 Park Center Dr.,#819PC
Alexandria, VA 22302
703-305-2286
FAX 703-305-1117
jean.daniel@fns.usda.gov

Team Leader, Publishing/AV Branch
Chris Kocsis
3101 Park Center Dr.,#814PC
Alexandria, VA 22302
703-305-2286
FAX 703-305-1117
chris.kocsis@fns.usda.gov

Team Leader, News Branch
3101 Park Center Dr.,#815PC
Alexandria, VA 22302
703-305-2286
FAX 703-305-1117

Freedom of Info Act Officer
Sara Bradshaw
3101 Park Center Dr.,#308PC
Alexandria, VA 22302
703-305-2244
FAX 703-305-2921
sara.bradshaw@fns.usda.gov

FNS Regional Public Information Offices

Northeast Reg. PA Director
Charles De Julius
10 Causeway Street
Boston, MA 02222-1068
617-565-6395
FAX 617-565-6472
charles.dejulius@fns.usda.gov

Mid-Atlantic Reg. PA Director
Margarita Maisterrena
Mercer Corp. Park, 300 Corporate Blvd
Robbinsville, NJ 08691-1598
609-259-5091
FAX 609-259-5147
margarita.maisterrena.@fns.usda.gov

Southeast Reg. Public Affairs
Karen Dean
61 Forsyth St.,SW,Suite 112
Atlanta, GA 30303
404-562-1812
FAX 404-527-4502
karen.dean@fns.usda.gov

Midwest Reg. PA Director
Lawrence Rudmann
77 W. Jackson Blvd., 20th Flr
Chicago, IL 60604
312-353-1044
FAX 312-353-0171
lawrence.rudmann@fns.usda.gov

Mtn. Plains Reg. PA Director
Craig Forman
1244 Speer Boulevard, Rm903
Denver, CO 80204
303-844-0312
FAX 303-844-6203
craig.forman@fns.usda.gov

Southwest Reg. PA Director
Judy Barron
1100 Commerce Street,Rm5C30
Dallas, TX 75242
214-290-9802
FAX 214-767-6249
judy.barron@fns.usda.gov

Western Reg. PA Director
Cordelia Morris
550 Kearny Street, Rm 400
San Francisco, CA 94108
415-705-1311
FAX 415-705-1364
cordelia.morris@fns.usda.gov

Center for Nutrition Policy and Promotion
Information Director
John Webster
Suite 200 North Lobby,
1120 20th St., NW
Washington, DC 20036
202-418-2312
FAX 202-208-2322
john.webster@usda.gov

9. Food Safety

Food Safety and Inspection Service

The Office of Food Safety oversees the Food Safety and Inspection Service, the agency within USDA responsible for ensuring the safety, wholesomeness, and correct labeling and packaging of meat, poultry, and egg products. FSIS operates under the authority of the Federal Meat Inspection Act, the Poultry Products Inspection Act, and the Egg Products Inspection Act. FSIS sets standards for food safety and inspects and regulates all raw and processed meat and poultry products, and egg products sold in interstate commerce, including imported products. FSIS is working on a strategy for change to reduce the incidence of foodborne illness attributable to meat, poultry, and egg products.

In FY 1998, FSIS inspected over 7.8 billion poultry and more than 131.9 million head of livestock. Continuous inspection of 73 U.S. egg products plants was provided by 102 inspectors who inspected 2.164 billion pounds of egg products.

The activities of FSIS include:

- Inspecting poultry and livestock, as well as processed products made from them,
- Inspection of all liquid, frozen, and dried egg products,
- Setting standards for plant facilities, product contents, processing procedures, packaging and labeling, and microbial and chemical contamination,
- Analyzing products for microbiological and chemical adulterants,
- Conducting risk assessments, as well as epidemiologic and other scientific studies, to estimate human health outcomes associated with the consumption of meat, poultry, and egg products. These risk assessments and studies provide science-based information for risk management and communication.
- Educating consumers about foodborne illness by way of publications, educational campaigns, and a toll-free, nationwide Meat and Poultry Hotline.

FSIS inspectors check animals before and after slaughter, preventing diseased animals from entering the food supply and examining carcasses for visible defects that can affect safety and quality. Inspectors also test for the presence of drug and chemical residues that violate Federal law. Over the last 20 years, FSIS has made significant progress in reducing the violation rate for drug residues.

More than 7,500 FSIS inspectors carry out the inspection laws in over 6,400 privately owned meat, poultry, and other slaughtering or processing plants in the United States and U.S. Territories.

Table 9.1

Livestock, poultry, and egg products federally inspected in 1998	
Cattle	33,272,859
Swine	93,258,884
Other livestock	5,380,056
Poultry	7,871,191,688
Egg products	2,164,000,000

In addition, about 250,000 different processed meat and poultry products fall under FSIS inspection. These include hams, sausages, soups, stews, pizzas, frozen dinners, and products containing 2 percent or more cooked poultry or at least 3 percent raw meat. In addition to inspecting these products during processing, FSIS evaluates and sets standards for food ingredients, additives, and compounds used to prepare and package meat and poultry products.

As part of the inspection process, FSIS inspectors test for the presence of pathogens and toxins such as *Salmonella, Listeria monocytogenes*, and *Staphylococcal enterotoxin* in ready-to- eat and other processed products. No pathogens are permitted in such products.

FSIS also tests for pathogens in some raw products. In 1994, USDA declared *E.coli* O157:H7 an adulterant in raw ground beef and established a monitoring program for the pathogen in raw ground beef. As part of the Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems final rule in July 1996, FSIS for the first time set pathogen reduction performance standards for *Salmonella* that slaughter plants and plants producing raw ground products must meet. The final rule also requires meat and poultry slaughter plants to conduct microbial testing for generic *E.coli* to verify the adequacy of their process controls for the prevention of fecal contamination.

Imported meat and poultry are also subject to FSIS scrutiny. The agency reviews and monitors the foreign inspection systems to ensure they are equivalent to the U.S. system before those countries are allowed to export. When the products reach the United States, products are reinspected at 155 active import locations by import inspection personnel.

More than 2.8 billion pounds of meat and poultry passed inspection for entry in the United States from 32 countries during 1998.

Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems— Implementation— Phases I & II

FSIS issued its landmark rule, Pathogen Reduction; Hazard Analysis and Critical Control Point (HACCP) Systems on July 25, 1996. The rule addresses the serious problem of foodborne illness in the United States associated with meat and poultry products by focusing more attention on the prevention and reduction of microbial pathogens on raw products that can cause illness. It also clarifies the respective roles of government and industry in food safety. Industry is accountable for producing safe food. Government is responsible for setting appropriate food safety standards, maintaining vigorous oversight to ensure those standards are met, and operating a strong enforcement program to, among other things, deal with plants that do not meet regulatory standards.

The Pathogen Reduction and HACCP rule: (1) requires all meat and poultry plants to develop and implement written standard operating procedures for sanitation (SSOP's), (2) requires meat and poultry slaughter plants to conduct microbial testing for generic *E. coli* to verify the adequacy of their process controls for the prevention of fecal contamination, (3) requires all meat and poultry plants to develop and implement a system of preventive controls, known as HACCP, to improve the safety of their products, and (4) sets pathogen reduction performance standards for *Salmonella* that slaughter plants and plants producing raw ground products must meet.

The Pathogen Reduction and HACCP rule applies to over 6,400 federally inspected and 2,400 State-inspected slaughter and processing plants in the United States. Countries that export meat and poultry products to the United States must also meet the requirements of the final rule. Egg products are not covered by the final rule, but FSIS has developed a strategy that will include HACCP to improve the safety of eggs and egg products.

Implementation of the new science-based, prevention-oriented food safety system began on January 27, 1997, and will be completed by January 25, 2000. On January 27, 1997, all plants, regardless of size, were required to have in place written SSOP's, and slaughter plants were required to begin testing for generic *E. coli*. On January 26, 1998, large plants, those with 500 or more employees, were required to have HACCP systems in place and meet the performance standards for *Salmonella*. Small plants, defined as having 10 or more but fewer than 500 employees, were required to implement the Pathogen Reduction and HACCP rule by January 25, 1999. Very small plants, defined as having less than 10 employees or less than $2.5 million in sales, must meet the requirements on January 25, 2000.

Implementation in large and small plants has been smooth. Large plants had a 92-percent compliance rate with the HACCP requirements for 1998. The new prevention-oriented meat and poultry inspection system is showing positive results. New data from the first year of testing in large plants show that the prevalence of *Salmonella* in broilers, swine, ground beef, and ground turkey was substantially lower after HACCP implementation. For these four product classes combined, 88 percent of large plants with completed sample sets are meeting the *Salmonella* standard.

Data on the prevalence of *Salmonella* in small plants for the first 6 months will be available soon.

For more information on HACCP and compliance, visit the FSIS web site at: *http://www.fsis.usda.gov*, and access "HACCP Implementation."

Table 9-2.

Prevalence of *Salmonella* in meat and poultry products: Post-HACCP implementation results from large plants—January 26, 1998, through January 25, 1999.*

Class of Product	Salmonella *Performance Standard (%)***	*Post-HACCP implementation* Salmonella *Prevalence (%, n=no. samples)*
Broilers	20.0%	10.9% (n=5697)
Swine	8.7%	6.5% (n=1532)
Ground Beef	7.5%	4.8% (n=1184)
Ground Turkey	49.9%	36.4% (n=748)

*Reflects testing results from products with 10 or more complete sample sets.
**9 Code of Federal Regulations, paragraphs 310.25(b) and 381.94 (b)

Technical Service Center

To prepare the agency to implement its new food safety strategy, including the Pathogen Reduction and HACCP final rule, FSIS launched a major reorganization. As part of that reorganization, in May 1997, the Technical Service Center (TSC) was established in Omaha, NE, to provide technical guidance to the agency's workforce, plant owners and operators, State and foreign officials, industry representatives, and others about meat, poultry, and egg products. The goal was to concentrate in one location the technical expertise previously scattered in numerous headquarters and field offices.

On January 20, 1998, the TSC began operating a toll-free HACCP Hotline in order to provide technical assistance and guidance to meat and poultry plants when HACCP implementation began. The Hotline is staffed by a team of technical experts trained to address HACCP technical and implementation questions and concerns. The TSC staffers respond to telephone, electronic mail, and FAX inquiries. **The toll-free Hotline number is: 1-800-233- 3935, Press 2 to connect to HACCP Hotline**. For more information, visit the TSC web site at: *http://www.fsis.usda.gov/ofo/TSC*.

Food Safety From Farm to Table

Ensuring food safety is the first priority of the Office of Food Safety and FSIS. As industry complies with the new HACCP and pathogen reduction requirements over a 3-year period, FSIS is moving to a position to more effectively protect consumers from unsafe meat and poultry. First, as effective implementation occurs within plants, inspection resources can be focused more directly on food safety concerns. Second, FSIS will be able to expand its efforts beyond the four walls in slaughter and processing plants to other parts of the farm-to-table food safety chain, and many authorities and responsibilities at each link. The agency is working cooperatively with other agencies, producers, and various organizations to minimize hazards throughout the farm-to-table continuum and thereby reduce foodborne illness.

Animal Production Food Safety Program

The role of the FSIS Animal Production Food Safety Program (APFSP) in USDA's food safety mission is to work with other Federal agencies with food safety responsibilities to ensure that efforts are coordinated for the food-animal production community, and to foster collaborative opportunities and initiatives for public/private investments in APFSP risk reduction activities and strategies. The APFSP provides leadership and assistance to foster research needed to develop voluntary science-based good production and verification programs for animal production that will reduce chemical, physical, and microbial risk from entering the food chain, supports FSIS public health and commodity food safety initiatives, and is the liaison to the animal production community.

For more information on the APFSP: *http://www.fsis.usda.gov/OPPDE/ap/default.htm*

HACCP-Based Inspection Models Project

As FSIS proceeds with HACCP implementation, the agency is also continuing its HACCP-based inspection models project. FSIS is developing new inspection models for slaughter plants that slaughter young, generally healthy, uniform animals. Baseline organoleptic and microbial data are currently being collected to document the accomplishments of the current inspection system. Data will also be collected when the new slaughter models, along with modified plant HACCP and process controls, are tested in order to provide a before-and-after picture. FSIS will cooperate very closely with the States on this project to achieve the agency's goal of establishing one fully integrated system that utilizes all available resources to improve food safety.

Workforce of the Future

As FSIS implements its food safety strategy, the agency is working to ensure its workforce is qualified to function in a HACCP-based inspection system. The workforce of the future will be more versatile and better trained. FSIS has decided to introduce and use the professional series of Consumer Safety Officer (CSO) as a major occupation in our workforce. Consumer safety officers will possess the needed scientific qualifications for employees at the field level. The conversion of the major part of the agency's workforce from inspectors to CSO's will be accomplished over time.

FSIS is also in the process of strengthening the role of veterinarians in the agency. FSIS believes its veterinary medical officers are underutilized and wants to make better use of the veterinarians' skills in epidemiology, microbiology, toxicology, and other scientific areas throughout the regulated food production and distribution process.

Regulatory Reform

FSIS continues to make progress on regulatory reform. This initiative was begun in 1995 to improve food safety, allow a more productive use of Federal resources, eliminate unnecessary burdens, and expand consumer choice in the marketplace. One direction in which the agency is headed is a shift away from "command and control"

regulations toward performance standards, which provide companies with the flexibility needed to be innovative. FSIS issued new performance standards for the production of cooked beef products, uncured meat patties, and certain poultry products. Additional performance standards will be issued in the future.

In order to eliminate unnecessary regulatory burdens, FSIS eliminated the requirements for prior approval of blueprints, equipment, and certain partial quality control programs. The proposed rule on the irradiation of meat and meat products that was published in the *Federal Register* on February 24, 1999, is an example of a regulation that will improve food safety and allow companies to innovate.

Emerging Issues

Over the past several years, FSIS has enhanced the public health focus of its food safety program, helping the agency address emerging and re-emerging issues. Based on data from the Centers for Disease Control and Prevention (CDC), *Campylobacter* is the number one cause of sporadic cases of foodborne illness. FSIS has a monitoring program for all classes of raw chicken carcasses to determine *Campylobacter* prevalence, and in January 1999 began a 1-year baseline data collection in young chickens to update a previous baseline study. The information from the baseline study will be used to establish performance standards for *Campylobacter*.

FSIS announced a strategy for controlling *Listeria monocytogenes* in ready-to-eat meat and poultry products in May 1999. First, the agency is requiring plants to reassess their HACCP plans to adequately address *Listeria*. Second, FSIS is providing guidance to the industry on practices that have been shown to prevent Listeria. Third, FSIS also announced four longer term initiatives on *Listeria monocytogenes*. For more information on the *Listeria* strategy, visit the FSIS web site at: *http://www.fsis.usda.gov*, and access "*Listeria*."

President's Council on Food Safety

In late August 1998, President Clinton signed an Executive Order establishing the President's Council on Food Safety. The Council was established to promote a more coordinated approach to food safety in this country. The primary functions of the Council are: to develop a comprehensive strategic Federal food safety plan; advise agencies of priority areas for investment in food safety, ensuring that Federal agencies annually develop coordinated food safety budgets; and oversee the recently established Joint Institute for Food Safety Research, ensuring that it addresses the highest priority research needs. The Secretaries of Agriculture and of Health and Human Services and the Assistant to the President for Science and Technology/Director of the Office of Science and Technology serve as Joint Chairs of the Council. The President's Council is the next step toward a goal of ensuring that there is a seamless, science-based food safety system in this country.

For more information on the President's Council on Food Safety and the President's Food Safety Initiative, visit the Council's web site at: *http://www.foodsafety.gov*, and access "President's Council on Food Safety."

Foodborne Diseases Active Surveillance Network (FoodNet) and PulseNet

Through the Foodborne Diseases Active Surveillance Network (FoodNet), FSIS, the Food and Drug Administration (FDA), and the CDC, in collaboration with State and local health departments at eight locations or sites across the country, are better able to track the incidence of foodborne illness. They can also monitor the effectiveness of food safety programs or control measures, such as USDA's Pathogen Reduction/HACCP rule, in reducing foodborne illness. FoodNet does not replace, but rather augments, the many longstanding activities of the Federal and State agencies that are used to identify, control, and prevent foodborne disease hazards. USDA, in conjunction with the other Federal and State agencies, submits an annual report to Congress on FoodNet activities. For more information on FoodNet or for copies of the report, visit the FoodNet web site at: *http://www.cdc.gov/ncidod/dbmd/foodnet*.

PulseNet is a national computer network of public health laboratories that helps to rapidly identify and stop episodes of foodborne illness. The laboratories perform DNA "fingerprinting" on bacteria that may be foodborne, and the network permits rapid comparison of these "fingerprint" patterns through an electronic database at the CDC. PulseNet is an early warning system that links seemingly sporadic human illnesses together; as a result, more outbreaks can be recognized, especially those that involve many States. Investigation of these outbreaks should result in identification of hazards and implementation of new measures to increase the safety of the food supply. For more information, visit the PulseNet web site at: *http://www.cdc.gov/ncidod/dbmd/pulsenet/pulsenet.htm*

International Food Safety

In today's global marketplace, the food consumers eat is likely to come from a number of different countries. Consumers must have confidence in the safety of their food, whether it is produced domestically or imported. The Codex Alimentarius Commission (Codex) is the food standards program jointly supported by the Food and Agriculture Organization of the United Nations and the World Health Organization. Codex was established to help protect the health of consumers and to facilitate trade through the establishment for international food standards, codes of practice, and other guidelines. There are many Codex committees that set standards for a variety of commodities and that address a number of general issues. The work of Codex, along with national food safety agencies, is important to maintaining consumer confidence in the safety of the food supply.

Currently, there are more than 160 member countries in Codex Alimentarius. In the United States, officials from USDA, the FDA, and the U.S. Environmental Protection Agency (EPA) participate in Codex activities. The U.S. Manager for Codex reports to the Under Secretary for Food Safety in USDA. For more information on Codex, visit the FSIS web site: *http://www.fsis.usda.gov*, and access "U.S. Codex Office."

In December 1994, the Sanitary and Phytosanitary Agreement, commonly known as the SPS Agreement, was ratified by the United States. This agreement changed international law in that signatory countries can now use either the *same* or *equivalent* sanitary measures to meet the level of protection established by an import-

ing country, and the importing country has the right to decide if a foreign inspection system is equivalent. This contrasts with the "equal to" approach that was in place prior to December 1994. U.S. meat and poultry inspection laws and regulations were amended to comply with the requirements of the SPS Agreement. FSIS has developed a process for evaluating whether exporting countries have systems and measures in place that are equivalent to the U.S. system. The agency is also working through the Codex's Committees on Food Import and Export Inspection and Certification Systems to develop international guidelines on determining equivalence to better protect the public health and facilitate trade.

Food Safety and Consumer Education

FSIS conducts an extensive outreach program of consumer education to meet information needs for basic safe food handling advice to avoid foodborne illnesses. Information is disbursed to the media, information multipliers, and consumers through the FSIS web site, printed materials, videos, personal contact via USDA's Meat and Poultry Hotline, and presentations by FSIS representatives.

The agency's consumer education programs focus on providing key food safety materials to the general public and special groups who face increased risks from foodborne illness—the very young, the elderly, people who have chronic diseases, and people with compromised immune systems. These materials are based on the latest scientific advice in education and market research concerning foodborne illness. Educational materials include a wide variety of specific safe food handling advice on *E. coli* O157:H7, *Listeria monocytogenes* and other pathogens, food safety information for seniors and children, and *The Food Safety Educator*—a free quarterly newsletter available in print or on the FSIS web site. The Food Safety Education Office also produces news features, public service announcements, and joint food safety projects with other government agencies and food associations.

See "For More Information."

Partnership for Food Safety Education

The Partnership for Food Safety Education is a national organization dedicated to educating consumers about the importance of food safety. USDA serves as Federal Government liaison to the partnership, along with the U.S. Department of Education, U.S. Department of Health and Human Services, and the EPA.

The partnership was formed in 1997 in response to the President's National Food Safety Initiative and an independent panel report calling for a public-private partnership of industry, government, and consumer groups to educate the public about safe food handling to reduce foodborne illness.

While the United States has one of the safest food supplies in the world, preventing foodborne illness remains a major public health challenge. The partnership developed the Fight BAC!™ public education campaign in conjunction with the 1996 National Food Safety Initiative to simplify and provide useful information about safe handling of all foods.

Safe Handling Instructions

This product was prepared from inspected and passed meat and/or poultry. Some food products may contain bacteria that could cause illness if the product is mishandled or cooked improperly. For your protection, follow these safe handling instructions.

Keep refrigerated or frozen.
Thaw in refrigerator or microwave.

Keep raw meat and poultry separate from other foods. Wash working surfaces (including cutting boards), utensils, and hands after touching raw meat or poultry.

Cook thoroughly.

Keep hot foods hot. Refrigerate leftovers immediately or discard.

Fight BAC!™ Campaign

Fight BAC!™ is a far-reaching, ambitious and consumer-friendly public education campaign focused on safe food handling. The Fight BAC!™ campaign goal is to educate consumers on the four simple steps they can take to fight foodborne bacteria and reduce their risk of foodborne illness.

BAC!, the campaign's spokescharacter, is the invisible enemy who tries his best to spread contamination wherever he goes. By giving foodborne bacteria a personality, BAC! makes the learning process more meaningful and memorable for consumers of all ages.

The campaign stresses four key principles for preparing food safely and keeping it safe:

- Clean—wash hands and surfaces often;
- Separate—don't cross-contaminate;
- Cook—cook to proper temperatures; and
- Chill—refrigerate promptly.

To date, the Partnership for Food Safety Education has:

- built a network of partners—comprised of more than 500 national, State, and local organizations from the public health, government, consumer, and industry sectors—who support the Fight BAC!™ campaign and distribute educational materials;
- produced an animated television public service announcement (PSA) featuring the BAC! character, which aired on more than 100 television stations reaching more than 310 million viewers in the early stages of the campaign. The PSA has been translated into other languages, including Spanish, Chinese, Korean, and Vietnamese;
- created and distributed a Fight BAC!™ brochure in both English and Spanish outlining the basics of fighting foodborne bacteria;
- developed a web site (*http://www.fightbac.org*) that has generated millions of hits from the United States and 50 other countries;
- mobilized hundreds of supermarkets across the country to participate in the Fight BAC!™ campaign by featuring the logo and consumer tips on flyers, signs, and grocery bags; and
- designed an elementary school program, which educates through entertainment using BAC! puppets, games, and songs.
- designed and distributed over 10,000 school-based programs for 4-6 grade educators that include a video, teachers guide, classroom posters, and a BAC! catcher game.

USDA Meat and Poultry Hotline

Consumers have been calling USDA's toll-free Meat and Poultry Hotline for answers to their food safety questions since 1985. The Hotline, part of FSIS' Food Safety Education Staff, is staffed by home economists, registered dietitians, and food technologists with expertise in food safety.

Consumers are the primary users of the Meat and Poultry Hotline, but by no means the only ones. Hotline specialists frequently advise and consult with other professionals in government, academia, and industry. The Hotline responds to hundreds of media calls each year and is responsible for bringing food safety information to millions of consumers through these media outlets. To further assist reporters, writers, educators, and other information multipliers, the Hotline develops and periodically mails educational materials to several thousand newspaper and magazine food and health editors and some consumer affairs professionals.

The Hotline received 109,804 calls between January 1 and December 31, 1999. Many were basic food handling questions, often related to safe preparation of holiday meals. Other questions reflected concern for the overall safety of the food supply, covering such topics as meat inspection reform, *E. coli* O157:H7 testing, premature

browning of ground beef, transportation and storage of shell eggs, food irradiation, labeling claims, agricultural practices, and product recalls.

Its nationwide service area enables the Meat and Poultry Hotline to serve as an early warning system, detecting possible public health threats. Data collected by the Hotline helps FSIS discern gaps in consumer knowledge. In essence, Hotline callers serve as a focus group. Analysis of caller questions and concerns allows FSIS to plan effective educational campaigns.

What To Do If You Have a Problem With Food Products

- FOR HELP WITH MEAT, POULTRY, AND EGG PRODUCTS:
  Call the toll-free USDA Meat and Poultry Hotline at 1-800-535-4555; (202-720-3333 in the Washington, DC, area; TTY, 1-800-256-7072).
- FOR HELP WITH RESTAURANT FOOD PROBLEMS:
  Call the Health Department in your city, county, or State.
- FOR HELP WITH NONMEAT FOOD PRODUCTS:

Call or write the Food and Drug Administration (FDA). Check your local phone book under U.S. Government, Health and Human Services, to find an FDA office in your area. The FDA's Food and Information & Seafood Hotline telephone number is 1-800-332-4010 (or 202-205-4314 in the Washington, DC, area).

For More Information

Food Safety and Inspection Service

USDA's Meat and Poultry Hotline may be reached by calling: 1-800-535-4555 (voice)
202-720-3333 (Washington, DC area), or 1-800-256-7072 (TTY).
Callers may speak with a food safety specialist from 10:00 a.m. to 4:00 p.m. weekdays, Eastern Time. Recorded messages are available at all times.
FSIS. web site: *http://www.fsis.usda.gov*

Director, Congressional and Public Affairs
Linda Swacina
Rm 1175-S
Washington, DC 20250
202-720-3897
FAX 202-720-5704
linda.swacina @usda.gov

Deputy Director, Congressional and Public Affairs
Christopher Church
Rm 1175-S
Washington, DC 20250
202-720-9113
FAX 202-720- 5704
christopher.church@usda.gov

Director, Food Safety Education
Susan Conley
Rm 2932-S
Washington, DC 20250
202-720-7943
FAX 202-720-1843
susan.conley@usda.gov

Deputy Director, Food Safety Education
Sandy Facinoli
Rm 2932-S
Washington, DC 20250
202-720-7943
FAX 202-720-1843
sandy.facinoli@usda.gov

Media Staff
Elizabeth Gaston
Rm 1175-S
Washington, DC 20250
202-720-9113
FAX 202-720-5704
elizabeth.gaston@usda.gov

Carol Blake
Rm 1175-S
Washington, DC 20250
202-720-9113
FAX 202-720-5704
carol.blake@usda.gov

Constituent Affairs Staff
Barbara O'Brien
Rm. 1175-S
Washington, DC 20250
202-720-8594
FAX 202-720-5704
barbara.o'brien@usda.gov

Manager, Meat and Poultry Hotline
Bessie Berry
Rm 2925-S
Washington, DC 20250
202-720-5604
FAX 202-690-2859
bessie.berry@usda.gov

Freedom of Info Act Officer
Cheryl Hicks
Rm 3134-S
Washington, DC 20250
202-720-2109
FAX 202-690-3023
cheryl.hicks@usda.gov

10. Natural Resources and Environment

Forest Service

Mission

The Forest Service mission is "to sustain the health, productivity, and diversity of the land to meet the needs of present and future generations." "Caring for the Land and Serving People" expresses the spirit of the mission. The mission is further expressed in the Forest Service land ethic: "Promote the sustainability of ecosystems by ensuring their health, diversity, and productivity," which is coupled with the service ethic: "Work collaboratively and use appropriate scientific information in caring for the land and serving people."

These land and service ethics are applied by the Forest Service through ecosystem management. Ecosystem management is the integration of ecological, economic, and social factors in order to maintain and enhance the quality of the environment to meet current and future needs.

The three strategic goals of the Forest Service are to: (1) ensure sustainable ecosystems, (2) provide multiple benefits for people within the capabilities of ecosystems, and (3) ensure organizational effectiveness.

In March 1998, the Forest Service Chief released the Forest Service Natural Resource Agenda. The agenda identifies four key areas of national focus. They are:

- Watershed health and restoration
- National sustainable forest ecosystem management
- Forest roads management
- Recreation enhancement

Implementation of the agenda will help bring people together and help them find ways to live within the limits of the land. This in turn will ensure that future generations will forever be endowed with the rich natural bounty of our Nation.

Principal Laws

The Forest Service administers the lands and resources of the National Forest System (NFS) under the Organic Administration Act of 1897, the Multiple Use-Sustained Yield Act of 1960, and the National Forest Management Act of 1976.

The agency also conducts research, provides assistance to State and private landowners, assesses the Nation's natural resources, and provides international assistance and scientific exchanges. These activities are carried out under the Forest and Rangeland Renewable Resources Planning Act of 1974, the Renewable Resources Extension Act of 1978, the Forest and Rangeland Renewable Resources Research Act

of 1978, the Cooperative Forestry Assistance Act of 1978, and the International Forestry Cooperation Act of 1990.

Organizational Structure

The Chief, the top administrative official of the Forest Service, reports to the Secretary of Agriculture through the Under Secretary for Natural Resources and Environment. The Forest Service typically is viewed as consisting of three major components: (1) the National Forest System (NFS), (2) State and Private Forestry (S&PF), and (3) Research and Development (R&D). However, the agency supports many other programs, such as International Programs and Job Corps Civilian Conservation Centers. The NFS is organized into a Deputy Area within the Washington Office, 9 regional offices, 155 national forests managed by 115 supervisors' offices, and approximately 570 ranger districts and national grasslands.

The Forest Service manages the 191.6-million-acre NFS and supports multiple use and sustained yield of renewable resources such as water, livestock forage, wildlife and fish, wood, and recreation; and integration of mineral resource programs and visual quality. The agency also mitigates, when appropriate and in a scientific manner, wildfires, epidemics of disease and insects, erosion, floods, water quality degradation, and air pollution.

The NFS provides many recreational activities for the public. In 1997, it hosted more than 800 million recreation experiences—43 percent of the outdoor recreation use on public lands—including 60 percent of the Nation's skiing and significant percentages of hiking, camping, hunting, fishing, and driving for pleasure. NFS manages 4,385 miles of the Wild and Scenic Rivers System; 412 units of the National Wilderness Preservation System, 133,000 miles of trails; more than 250,000 heritage sites; and over 18,000 campgrounds, picnic areas, and visitor facilities.

The National Forests and Grasslands contribute $134 billion to the gross domestic product.

The Forest Service administers many S&PF programs to provide technical and financial conservation assistance to State and private nonindustrial forest land. These programs serve as a link among many public and private organizations, and they help to promote the best use and conservation of America's natural resources on private lands. Wildland fire protection on private and public lands, Smokey Bear, forest health protection, and natural resource education are examples of S&PF programs. S&PF is organized into a Deputy Area within the Washington Office; it has an office in Radnor, PA, to work with States and landowners in the Northeastern United States, and has programs delivered from most NFS offices.

The R&D program is organized into a Deputy Area within the Washington Office, including four program staffs and six geographically dispersed research stations. R&D also includes the Forest Product Laboratory in Madison, WI. R&D conducts and sponsors basic and applied research that generates credible, relevant knowledge and new technologies that are used to sustain the health, productivity, and diversity of the Nation's forests and rangelands to meet the needs of present and future generations. The R&D effort is focused on four broad themes: (1) improve management and protection of the vegetation on the Nation's forest and rangeland

ecosystems; (2) sustain ecological processes in the terrestrial, aquatic, and atmospheric components of forest and rangeland ecosystems and enhance the biological diversity of the water, wildlife, and fish resources; (3) assess the extent, health, productivity, and sustainability of forest and rangeland ecosystems; and (4) assess the condition, trends, and capabilities of forest and rangeland resources and provide conservation technologies that improve their use and reuse.

International Program activities supported by the Forest Service, including programs at the International Institute of Tropical Forestry in Puerto Rico, promote sustainable development and global environmental stability. The director of International Programs reports directly to the Chief.

The Office of Communication, Civil Rights Program, Reinvention Program, and Law Enforcement and Investigations Program also report directly to the Chief.

The Forest Service has received tentative approval from the Secretary to reorganize the Operations area of the Washington Office into three areas: Financial Management, Business Operations, and Programs and Legislation. The Financial Management area is led by the Chief Financial Officer to ensure proper allocation of funds, tracking, control, and reporting of expenditure of funds. The Business Operations Deputy Chief manages the human resource, information resource management, and procurement programs. The Programs and Legislation Deputy Chief manages the development of the agency's budget and coordinates legislative affairs.

As part of the Business Operations area and through agreement with the Department of Labor, the Forest Service operates 18 Job Corps Civilian Conservation Centers on Forest Service lands. This is the only Federal residential education/training program for the Nation's disadvantaged youth. Over 9,300 students enroll in Forest Service centers each year.

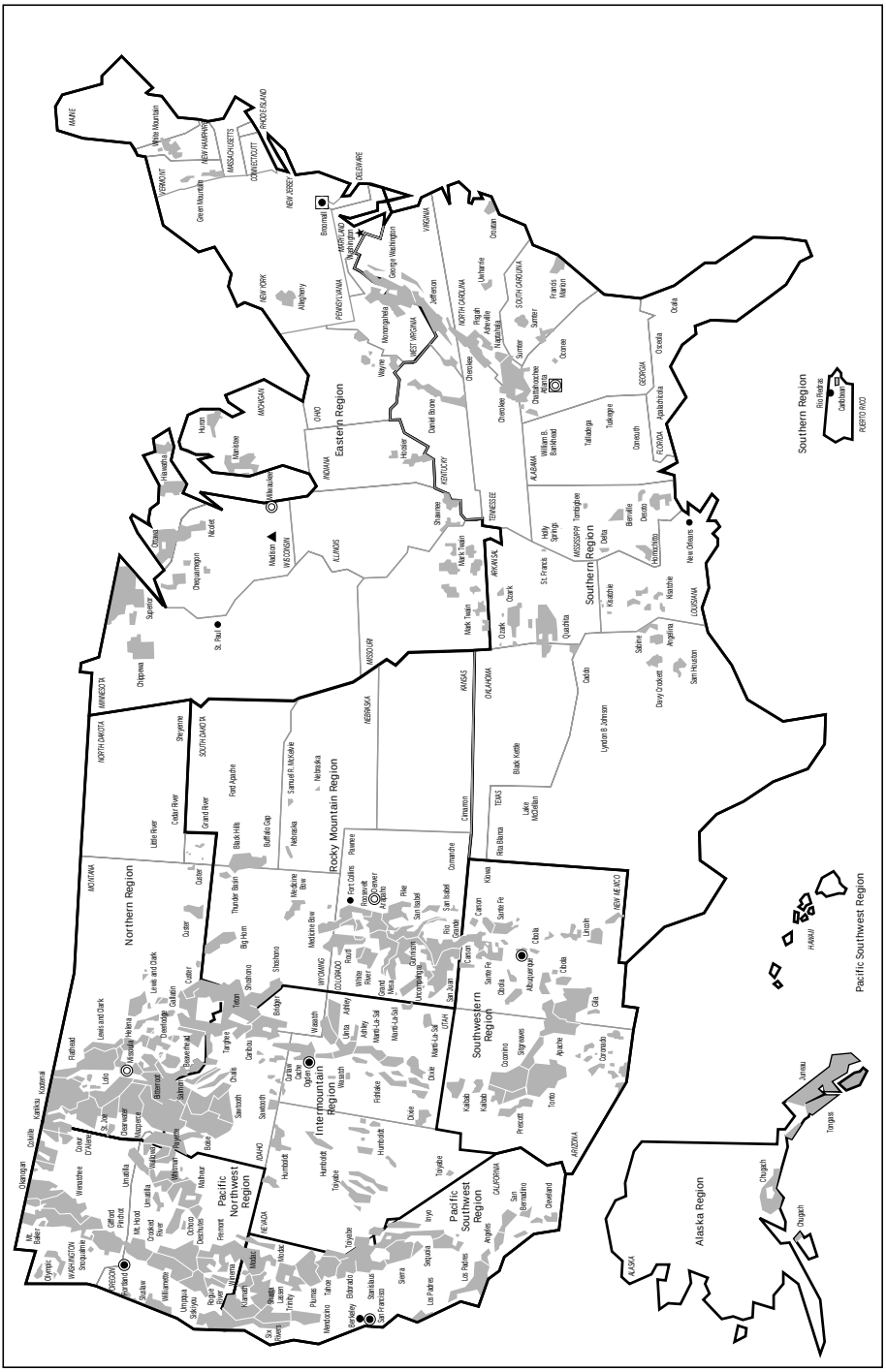
Reinvention

Creating a Forest Service that works better and costs less—that's what Forest Service reinvention is all about. As one of 30 Federal agencies designated by the National Partnership for Reinventing Government as a "High Impact Agency," it is dedicated to delivering first-rate customer service, cutting red tape to do its job more efficiently, and working with its partners—both in and out of government—to do the best job of caring for the land. Some recent highlights:

- With the Bureau of Land Management, the Forest Service is creating one-stop natural resource centers to better serve mutual customers, and sharing personnel and resources to enable both agencies to do their jobs better. In just two locations, this partnership is delivering better service and better resource stewardship while saving more than $1 million a year. In 1999, this effort will expand agency-wide.
- In the Pacific Southwest Region and Research Station, the Forest Service began an experiment to let employees create internal enterprise teams that will allow them to bring their entrepreneurial spirit and creativity to bear on all facets of their work. Over time, this will help us import the best practices of the business world and the efficiency of the free market place to raise the level of performance of the Forest Service in achieving its public sector mission.

Figure 10-1.

Location of National Forests


Northern Region
Rocky Mountain Region
Southwestern Region
Intermountain Region
Pacific Northwest Region
Pacific Southwest Region
Eastern Region
Southern Region
Alaska Region
Pacific Southwest Region
MAINE
VERMONT
NEW HAMPSHIRE
MASSACHUSETTS
CONNECTICUT
RHODE ISLAND
NEW JERSEY
DELAWARE
NEW YORK
PENNSYLVANIA
MARYLAND
VIRGINIA
WEST VIRGINIA
OHIO
INDIANA
ILLINOIS
MICHIGAN
WISCONSIN
KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
ALABAMA
MISSISSIPPI
LOUISIANA
ARKANSAS
MISSOURI
IOWA
MINNESOTA
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
OKLAHOMA
TEXAS
NEW MEXICO
COLORADO
WYOMING
UTAH
NEVADA
ARIZONA
CALIFORNIA
OREGON
WASHINGTON
IDAHO
MONTANA
FLORIDA
HAWAII
ALASKA
PUERTO RICO
Green Mountain
White Mountain
Allegheny
Monongahela
George Washington
Jefferson
Daniel Boone
Hiawatha
Huron
Manistee
Chippewa
Superior
Chequamegon
Nicolet
Ottawa
Hiawatha
Mark Twain
Shawnee
Ozark
St. Francis
Ozark - St. Francis
Quachita
Kisatchie
Sabine
Angelina
Davy Crockett
Sam Houston
Caddo
Lyndon B. Johnson
Black Kettle
Cimarron
Comanche
Cibola
Kiowa
Carson
Santa Fe
Lincoln
Gila
Coconino
Kaibab
Prescott
Tonto
Apache
Coronado
Cleveland
San Bernardino
Los Padres
Inyo
Sierra
Stanislaus
Eldorado
Tahoe
Plumas
Mendocino
Klamath
Rogue River
Siskiyou
Umpqua
Willamette
Mt. Hood
Deschutes
Ochoco
Malheur
Umatilla
Wallowa-Whitman
Payette
Boise
Sawtooth
Challis
Salmon
Caribou
Targhee
Bridger
Wasatch
Ashley
Uinta
Manti-La Sal
Dixie
Fishlake
Humboldt
Toiyabe
Lewis and Clark
Helena
Beaverhead
Deerlodge
Gallatin
Custer
Shoshone
Big Horn
Thunder Basin
Medicine Bow
Bighorn
Nez Perce
Clearwater
Kootenai
Colville
Okanogan
Wenatchee
Gifford Pinchot
Mt. Baker-Snoqualmie
Olympic
Ashley
Uinta
Wasatch-Cache
Dixie
Kaibab
Coconino
Gila
Lincoln
Santa Fe
Carson
Cibola
Kiowa
Black Kettle
Lake McClellan
Rio Grande
Rio Blanco
Pike
San Isabel
Arapaho
Roosevelt
Nebraska
Samuel R. McKelvie
Buffalo Gap
Black Hills
Ft. Pierre
Grand River
Cedar River
Little Rock
Shoshone
Bridger
Caribou
Challis
Salmon
Sawtooth
Humboldt
Toiyabe
Inyo
Los Padres
San Bernardino
Angeles
Cleveland

- In partnership with six other Federal agencies, the Forest Service unveiled an Internet program that makes it possible for anyone with access to a computer to learn about outdoor recreation opportunities on all Federal public lands.

This new one-stop source lets customers discover for themselves the tremendous recreation options in "America's Great Outdoors" and to plan their vacations on-line. Try it out at *www.recreation.gov* and see for yourself what reinvention at the Forest Service can do for you.

National Forest System—Conservation and Multiple Use

Lands

Lands-related activities include exchanging lands to protect and enhance the National Forest System, preventing encumbrances, protecting boundaries and records, granting appropriate rights to others, and administering rights granted to or retained by other agencies, governments, and landowners.

Wildlife, Fish, and Rare Plants

In 1996, wildlife and fish recreation expenditures tied to national forests tallied $6.8 billion in association with 125.7 million visitor days of hunting, fishing, and wildlife/fish-associated viewing. Anglers spent $2.7 billion (46.8 million visitor days), wildlife/fish viewers spent $2.1 billion (52 million activity days), and hunters spent $2.0 billion (27 million activity days) in pursuit of their pastimes. This $6.8 billion in direct spending translates to a total of $20 billion in local economic output and 226,000 jobs. Specific examples include:

- Commercial salmon harvested from the Tongass National Forest averages 120 million pounds per year, with an average annual earnings of $66 million. Meanwhile, sportfishing numbers in Southeast Alaska increased by 62 percent from 1984 to 1993, a significant revenue source for local economies.
- In 1997, nearly 183,000 people joined in "Celebrating Wildflower" events on national forests.
- The Forest Service and its partners held 3,985 aquatic education events in 1997 that landed 274,000 people. Events included National Fishing Week, Pathways to Fishing clinics, and classroom talks.

Key Facts About the Forest Service

- *The entire Nation has about 1.6 billion acres of forest and rangeland, under all ownerships.*
- *The entire Nation has 736.7 million acres of forest land area, not including rangeland, under all ownerships; the owners/managers of this forest land are as follows:*
  - *Federal Government: 249.1 million acres*
  - *Forest Service: 139.9 million acres*
  - *Bureau of Land Management: 36.6 million acres*
  - *National Park Service, Department of Defense, Department of Energy, & other Federal: 72.6 million acres*
  - *Non-Federal total: 487.5 million acres*
  - *State: 54.7 million acres*
  - *9.9 million private landowners: 422.3 million acres*
  - *County and municipal: 10.5 million acres*
- *There are 191.8 million acres of national forest system land. This is 8.3 percent of the United States' land area, or about the size of Texas. The Forest Service manages:*
  - *National Grasslands: 3.9 million acres*
  - *National Primitive Areas: 173,762 acres*
  - *National Scenic-Research Areas: 6,630 acres*
  - *National Wild & Scenic Rivers: 4,385 miles—95 rivers*
  - *National Recreation Areas: 2.7 million acres*
  - *National Game Refuges and Wildlife Preserves: 1.2 million acres*
  - *National Monument Areas: 3.3 million acres*
  - *National Historic Areas: 6,540 acres*
  - *Congressionally Designated Wilderness: 34.7 million acres*
- *There are 88 wilderness areas designated Class 1 for air quality protection totaling 15 million acres.*
- *The value of the water from national forest lands is over $3 billion per year.*
- *Approximately 14 percent of the Nation's water supply (about 280 acre-feet annually) comes from national forest lands.*
- *The Forest Service manages 155 national forests for multiple uses.*
  - *Miles of property boundary line: 249,000*
  - *Number of property corners: approximately 1 million*
- *The national forest trail system is the largest in the Nation, with 133,000 miles of trails for hiking, riding, cross-country skiing, snowmobiling, bicycling, and snowshoeing.*
- *The Forest Service provides more recreation than any other Federal agency. Visitors to national forests are attracted by:*
  - *5,800 campgrounds and picnic areas*
  - *328 swimming developments*
  - *1,222 boating sites*
  - *250 winter sports sites, including 135 downhill ski areas*
- *If all these sites were fully occupied at the same time, they would accommodate 1.8 million people.*
- *Minerals found on Forest Service lands provide more than $3.3 billion in private sector revenue.*

Key Forest Service figures for 1996:

- *Recreation use: 341.2 million visitor days (1 visitor day equals 12 hours of recreation use)*
- *Lands burned by wildfire: 530,000 acres*
- *Insect and disease suppression: 1.7 million acres*
- *Watershed improvements: 38,497 acres*
- *Terrestrial acres restored or enhanced for wildlife: 638,663*
- *Aquatic acres restored or enhanced for fisheries: 13,194*
- *Stream miles restored or enhanced for fisheries: 2,740*
- *Reforestation: 322,000 acres*
- *Livestock grazing: 9.3 million animal head months*
- *Grazing allotments administered: 8,808*
- *Timber sold: 3.7 billion board feet, enough to build over 300,000 homes*
- *Timber harvested: 3.3 billion board feet*
- *Road system: 377,800 miles*

Key Facts About Wildlife, Fish, and Rare Plants

- *The National Forest System includes 2.3 million acres of fishable lakes, ponds, and reservoirs and more than 197,000 miles of perennial streams.*
- *National forests and grasslands support habitats for more than 3,000 species of birds, mammals, reptiles, amphibians, and fish, as well as some 10,000 plant species.*
- *The national forests and grasslands also provide:*
  - *—80 percent of the elk, mountain goat, and bighorn sheep habitat in the lower 48 States,*
  - *—28 million acres of wild turkey habitat,*
  - *—5.4 million acres of wetland habitat,*
  - *—Habitat for 250 species of neotropical migratory birds, and*
  - *—More than 280 species of threatened or endangered plants, fish, or wildlife.*

Partnerships

In 1997, over $13 million in Federal funds was matched by partners' contributions, for a total of $37 million to accomplish partnership projects on wildlife; fish; and threatened, endangered, and sensitive species on the national forests and grasslands. Specific partnership examples include:

- Quail will have terrific feasting grounds as a result of a partner project designed to benefit bobwhite. Legumes flourish on the freshly mowed, disced, fertilized, and seeded 35-acre opening within the Tombigbee National Forest, Mississippi. Other seed-eating birds will find both food and cover plentiful too.

- Skilled birders identified hundreds of species of birds by their calls to compile a breeding bird census in specified habitats on the Chequamegon-Nicolet National Forest, Wisconsin. Now, forest management decisions can better include the needs of birds.
- High school students are making a difference in the recovery of the endangered slender-petalled mustard. Their hard work counting and measuring plants on the San Bernardino National Forest, California, contributed to a 7-year monitoring effort that identifies precipitation as a primary factor influencing population size. As a result, managers understand that maintaining good habitat and seedbank resources is key to recovery of this species.
- The lake sturgeon is a large, primitive fish that was once abundant in the Great Lakes. Today it is a sensitive species on the Superior National Forest, Minnesota. Netting and electrofishing surveys conducted in the Sturgeon River drainage in 1997 yielded only one fish. Managers are hopeful that the removal of a logjam that blocks migration of sturgeon into available habitat will increase the number of sturgeon utilizing the river.
- A riparian tree-planting project along Sand Fork on the Wayne National Forest, Ohio, gave Federal prison inmates a chance to improve the lives of fish and wildlife. Along with Boy Scout Troop 115, they planted seedlings to stabilize stream banks and channels.

Water, Soil, and Air

Water flowing from the national forests is among the coolest and cleanest in the country. About 14 percent of the surface water supply in the United States flows from National Forest System (NFS) watersheds. The goals of the Forest Service's watershed, soil, and air management programs are to (1) manage watersheds to maintain or improve watershed conditions to sustain forestland and rangeland health for multiple uses; (2) sustain soil productivity, (3) protect 88 Class I wilderness areas from air pollution, and (4) evaluate Forest Service activities and their effect of air quality and watershed and soil condition.

The task of mapping all soils within NFS, with the cooperation of USDA's Natural Resources Conservation Service, is about 50 percent complete. In FY 1998, the Forest Service completed 3,888,497 acres of land to improve water and soil resources. Other significant ongoing activities include watershed inventory and analyses to better understand the capability of the watershed to sustain forestland and rangeland health; participating in water right adjudications; restoring desired watershed conditions on abandoned mines located on national forests; monitoring to determine air pollution impacts on visibility, water, and soil chemistry in wilderness areas; and collaborating on watershed health studies.

Rangeland

NFS rangeland is managed to conserve the land and its vegetation while providing food for both livestock and wildlife. Under multiple-use concepts, grazing areas also serve as watersheds, wildlife habitat, and recreation sites. Grazing privileges are

Key Facts About Water, Soil, and Air

- *There are approximately 3,200 watersheds on NFS lands which produce an average 280 million acre-feet of water annually.*
- *There are 3,336 municipalities, serving 60 million people, which get their tap water from NFS lands.*
- *173 trillion gallons of water is supplied by NFS municipal watersheds annually.*
- *About 600 remote weather data collection platforms are used in agricultural, fire, weather, and streamflow forecasting.*

granted on national forests and grasslands through paid permits; permittees cooperate with the Forest Service in range improvement projects.

NEPA decisions were made on allotments across the country in accordance with the Rescissions Act of 1995 (Public Law 104-19). The first 3-year time block in the 15-year Rescissions Act schedule, 1996 through 1999, ended with approximately one-third of all the livestock grazing allotments that needed environmental analyses being analyzed on schedule. Implementation of improved management was undertaken on these allotments. Monitoring both implementation and effectiveness of the management actions has been undertaken and will continue into the future.

The noxious weed management program was a success in FY 1998 with more acres treated than in previous years. This was accomplished by the Forest Service in cooperation with the States, counties, and cities working together to prevent the spread of noxious weeds, treat existing infestations, and educate citizens about noxious weed problems.

Key Facts About Rangeland[1]

- *In FY 1998, the Forest Service administered 8,783 grazing allotments.*
- *Permitted livestock grazing totaled to 9.3 million animal head months. (A head month is 1 month's occupancy by an adult animal.)*
- *By the end of 1998, 2,007 allotments under went environmental analyses in the first Recissions Act 3-year time block. Management decisions were made on them which is resulting in improved rangeland vegetation.*
- *In FY 1998, 117,812 acres of rangelands were treated to control noxious weeds infestations.*
- *Forage improvement took place on 36,808 acres of rangelands.*
- *In FY 1998, 1,752 structural improvements were constructed on NFS rangelands to implement management changes prescribed in recent decisions.*

[1]Rangeland improvements were accomplished with appropriated dollars, Range Betterment Funds, Trust Funds, Challenge Cost agreements, permit holder cooperation, and other private cooperation.

Energy, Minerals, and Geology

Energy and mineral development fosters economic development, as does the application of geologic principles on National Forest System lands, including development of private minerals underlying these lands. Ecosystems are protected by requiring appropriate design, mitigation, and reclamation measures, and by monitoring and inspecting operations to ensure compliance. Reclaiming abandoned mines on Forest Service land restores deteriorated ecosystems, and the Forest Service has reclaimed 38,000 abandoned mines.

Exploration, development, and production of energy and minerals from National Forest System lands contribute to economic growth, provide employment in rural communities, and raise revenues that are shared with the States. The energy and minerals component of the program is directed at obtaining these benefits while ensuring operations are conducted in an environmentally sound manner. In terms of the magnitude of the energy and minerals program, there are approximately 5.4 million acres leased for oil and gas, over 150,000 mining claims, about 7,000 mineral material pits and quarries, over 2,000 new operations proposed each year, and more than 20,000 operations to monitor and inspect. The largest coal mine in the United States is on NFS lands, and much of the Nation's phosphate and lead production comes from NFS lands. The value of all energy and mineral production exceeds $2 billion per year. Annual revenues are about $150 million, 25-50 percent of which is returned to the States where production occurs.

The geology and paleontology components of the program provide basic scientific information about the Earth's materials and processes. Forest Service geologists and paleontologists identify and interpret geologic and paleontological conditions and hazards for land management decisionmaking and cost-effective project design; inventory and evaluate sites with geologic and paleontological resources such as groundwater, fossils, and caves for appropriate management; and interpret sites having significance for scientific, educational, or recreational use. The interpretation is the legacy of all people, and the Forest Service recognizes its responsibility to manage that part of the fossil record occurring on NFS lands as a public legacy for future generations. Fossils are nonrenewable resources and their value may be greatly diminished or lost entirely in the absence of proper management.

The USDA Forest Service recognizes multiple-use values for fossil resources that include: legacy value for present and future generations, scientific value, educational and interpretive values, and recreational and aesthetic values.

Forest Vegetation Management

Approximately 73 percent of the 192 million acres of national forests is considered forested. Of the forested land, 29 percent is identified as suited for timber production and less than 1 percent is subject to some form of timber harvest treatment in any given year. Of the remaining 71 percent identified as not suited for timber production, some is protected from harvest but otherwise, salvage or harvest necessitated to make other multiple-use values may occur.

In most cases, forested ecosystems on the national forests are in a healthy, functioning condition due to past active management and environmental protection measures. These forests provide highly diverse and often unique resources, opportunities,

Key Facts About Forest Service Energy, Minerals, and Geology Program

- *7 million acres where there is a possibility for coal leasing (95 billion tons)*
- *45 million acres where there is a possibility for oil and gas leasing; 5.4 million acres leased*
- *About 7,000 sand, gravel, and stone pits and quarries*
- *Approximately 2,000 new operations requiring review each year*
- *Over 20,000 existing operations requiring monitoring*
- *55 percent of the Nation's production of lead*
- *One of the world's largest molybdenum deposits (Tongass National Forest, AK).*
- *Many of the Nation's 100,000 rock hounds, recreational mineral collectors, students, and geologic organizations use the national forests for education and recreational purposes.*
- *Noncommercial panning for gold is an activity that is rapidly increasing.*
- *The Forest Service manages fossil and geologic sites of interest as resources for present and future generations, scientific, education, interpretive, recreational, and aesthetic values.*
- *The most complete Champsosaurus skeleton in the world (55 million years old) came off national grasslands and is on display at FS headquarters.*
- *FS has partnerships with communities, States, and universities on managing the paleontological resource.*

The following resources are produced annually on NFS lands:

- *10 million barrels of oil*
- *250 billion cubic feet of gas*
- *115 million tons of coal*
- *500 million pounds of lead*
- *200 million pounds of copper*
- *11 million ounces of gold*
- *20 million tons of sand and gravel*

and experiences for the public. In some cases, ecosystems are not functioning in a way that can be sustained without unacceptable risk of losses to wildfire, insects, or diseases. It is important that the agency assess each ecological situation at the local level, establish management objectives based on ecological, social, and economic information, and utilize the best tools available to achieve established vegetation objectives.

The removal of woody biomass through the Forest Service's timber sale program is an essential component of national forest management. Restoration and maintenance of healthy forests is the best way to sustain the production of goods

and services and protect the environment. Timber sales represent one tool that can be used to achieve forestland restoration and maintenance goals. Furthermore, since timber sales generate some financial return, they may be the least net cost means of implementing desired vegetation management treatments.

The Forest Service is strongly committed to managing NFS lands in an ecologically sensitive manner. One of the agency's top priorities is to maintain and improve the health and vigor of forest ecosystems for the enjoyment of current and future generations. The Forest Service operates Federal timber sales under some of the most substantial and effective environmental protection policies in the world. The agency is taking an active role in managing vegetation to help achieve the complex interrelated objectives of resource use and environmental protection.

Stewardship Demonstration Projects

Experience has shown that the agency's traditional tools for managing vegetation—i.e., the standard timber sale and service contracts—are oftentimes not well suited to addressing many of today's most pressing vegetative management needs, or to implementing truly integrated resource management projects. The standard timber sale contract was designed to dispose of commercially valuable timber, but many of today's most important treatment needs—e.g., reducing excessive fuel loadings—often involve managing wood of little or no commercial value. The standard service contract can be a flexible and powerful tool, but funding frequently limits the amount of work that can be accomplished in this manner.

Recognizing the problems associated with its traditional vegetative management tools, in Section 347 of the Fiscal Year 1999 Department of the Interior and Related Agencies Appropriation Act (Public Law 105-277), Congress gave the Forest Service the authority to test an array of new processes and procedures through a series of 28 stewardship contracting end-results demonstration projects. Under the terms of this legislation, the projects that are undertaken are to address one or more of the following resource management objectives: road and trail maintenance or obliteration to restore or maintain water quality; soil productivity, habitat for wildlife and fisheries, or other resource values; prescribed fires to improve the composition, structure, condition, and health of stands or improve wildlife habitat; noncommercial cutting or removing of trees or other activities to promote healthy forest stands, reduce fire hazards, or achieve other noncommercial objectives; watershed restoration and maintenance; restoration and maintenance of wildlife and fish habitat; and control of noxious weeds and reestablishing native plant species.

The new processes and procedures the agency may test include the following: award of contracts on the basis of best value, service contracts of up to 10 years' duration, exchange of goods for services, retention of receipts, offer of sales valued at over $10,000 without advertisement, designation of timber to be cut by description, and use of State foresters as Federal agents in helping to prepare and administer national forest timber sales.

Key Facts About the Forest Vegetation Management Program

Accomplishments:

- *3.42 BBF (billion board feet) of timber offered for sale in FY 1998.*
- *2.96 BBF of timber sold and awarded in FY 1998.*
- *3.30 BBF of timber harvested in FY 1998.*
- *51 percent for timber commodity purposes.*
- *43 percent for forest stewardship purposes.*
- *6 percent for personal use purposes.*
- *525,755 acres subject to some type of harvesting operation in FY 1998.*
- *292,902 acres naturally or artificially regenerated in FY 1998*
- *300,202 acres of timber stand improvement treatments in FY 1998.*
- *27 MMBF (million board feet) of free use firewood provided in FY 1997.*
- *249,714 Christmas trees sold in FY 1997.*
- *$3.0 in special forest products sold in FY 1998.*
- *221,200 families assisted through personal use sales in FY 1997.*
- *2,322 miles of existing forest roads reconstructed in FY 1998.*
- *200 miles of new forest roads built in FY 1998.*

Economic Impacts:

- *55,535 local community jobs in FY 1997.*
- *$2.0 billion in regional income in FY 1997.*
- *$309 million in Federal income tax receipts in FY 1997.*
- *$220 million in receipt-share payments returned to States and counties in FY 1997.*
- *$345 million is estimated Net Present Value of long-term benefits and costs of program in FY 1997.*

Contributions to Other Resource Programs:

- *208,400 acres of wildlife habitat restored/enhanced in FY 1998.*
- *17,955 wildlife habitat improvement structures built in FY 1998.*
- *344 miles of fish habitat restored/enhanced in FY 1998.*
- *8,600 acres of range forage improvements in FY 1998.*
- *169 forage improvement structures built in FY 1998.*
- *18,200 acres of soil and water resource improvements in FY 1998.*
- *15,500 acres of fuels management in FY 1998.*

Passport in Time

Through the Passport in Time program, the Forest Service offers unique, nontraditional recreation opportunities such as archaeological excavation, historic structure restoration, and wilderness surveys. These experiences foster environmental stewardship while providing the public with unusual, educational experiences.

Passport in Time has over 13,000 volunteers contributing over $5.2 million worth of time and effort to preserve our Nation's history by restoring historic structures, stabilizing National Register eligible sites, evaluating sites for inclusion in the National Register of Historic Places, working on projects in wilderness, and developing heritage interpretive sites. Every activity is aimed at making our Nation's unique history accessible to the public and preserving it for future generations.

State and Private Forestry—Providing Assistance to Nonindustrial Private Landowners

The State and Private Forestry programs represent important tools for the monitoring, management, protection, and better use of America's forests, with emphasis on non-Federal forest land stewardship. These programs connect forestry to all land managers—whether small, urban woodlot owners, tribal foresters, State agencies, or Federal—in efficient, nonregulatory ways. Through a coordinated effort in management, protection, and better use, the programs of State and Private Forestry help facilitate sound forestry across ownerships on a landscape scale.

About 70 percent of America's forests are in State and private ownership, and 80 percent of the wood fiber potential comes from these lands. These lands are also critical to watershed conditions, fish and wildlife habitat, and the aesthetic quality of the Nation's landscape; and they represent one of the best sources of carbon sequestration. Since these non-Federal forests represent most of the forests in our country, keeping these lands healthy, productive, and sustainable in the rural and urban areas on a cumulative basis is especially important to the Nation. With increasing fragmentation and development pressure, the unique Federal role in maintaining the value and functions of these lands across ownership divisions has never been greater or more important.

Through a partnership role of technical advice and focused financial assistance, the program leverages Federal resources to help produce a variety of forest-based goods and services— including recreation, wildlife and fish, biological diversity, and timber—to help meet domestic and international needs.

Forest Health Protection

The Forest Service provides technical and financial assistance to Federal agencies, tribal governments, States, and (through State foresters) to private landowners. In 1997, with the assistance of State foresters and others, the Forest Service conducted insect and disease detection surveys on 203 million acres of NFS, other Federal land, and tribal lands, and 552 million acres of State and private lands. In addition, the Forest Service and State foresters participate in a forest health monitoring program. With USDA's Animal and Plant Health Inspection Service, the Forest Service works to protect the Nation's forests from exotic insects, diseases, and plants. The Forest Service provides technical assistance in the safe and effective use of pesti-

cides, shares the cost of insect and disease prevention and suppression projects with States, and funds prevention and suppression projects on Federal lands. The agency also evaluates and applies new, more efficient and environmentally sensitive technologies for forest health protection.

Cooperative Forestry—Providing Assistance to Nonindustrial Private Landowners and Community and Urban Areas

Cooperative Forestry (CF), in partnership with State forestry and other non-Federal forestry interests, provides for multidirectional links between Federal forestry programs and objectives and the non-Federal forestry sector. CF connects ideas and people to resources and one another so they can better care for forests to sustain their communities. Since the 1990 Farm Bill, all programs have strategic plans in place to guide nationwide delivery. CF has three major goals:

- Ensure sustainable ecosystems
- Provide multiple benefits for people within the capabilities of ecosystems
- Ensure organizational effectiveness

The Forest Stewardship Program provides technical assistance to nonindustrial private forest landowners interested in managing their forests for multiple resources. More than two-thirds of the Nation's forests are non-Federal, owned by 9.9 million nonindustrial private forest land owners. Since 1990, over 133,400 landowners have enrolled in the program, and stewardship plans have been prepared on more than 16.6 million acres of nonindustrial private forests.

The Stewardship Incentives Program provides cost share assistance to landowners implementing Forest Stewardship Landowner Plans. This program is managed in cooperation with State forestry agencies and USDA's Farm Service Agency to provide assistance on more than 250,000 acres annually. This includes approximately 50,000 acres of tree planting annually. Since 1990, Stewardship Incentives Program practices have been implemented on 1.5 million acres, including approximately 200,000 acres of tree planting.

The Forest Legacy Program is designed to effectively protect and conserve environmentally important forest areas that are threatened by conversion to nonforest uses. These lands can be protected through conservation easements and other mechanisms. This program is based on the concept of "willing seller and willing buyer" and is completely nonregulatory in its approach. No eminent domain authority or adverse condemnation is authorized. To date, 15 States have completed an Assessment of Need, which is the formal document that allows for entry into the Forest Legacy Program. Program partners include The Trust for Public Lands, State governments, and local land trusts. Since 1993, almost 62,000 acres in eight States have been protected from development. These lands have a value of more than $25 million and have been protected with about $18 million of Federal funds. States with legacy lands include Connecticut, Maine, Maryland, New Hampshire, New Jersey, New York, Vermont, and Washington.

Urban and Community Forestry (U&CF) is a key part of the agency's interest in urban forest resources management; it helps people better manage the natural resources where 80 percent of America lives. Through the National Tree Trust

Foundation, the National Urban and Community Forestry Advisory Council, Urban Resources Partnerships, and State Forestry agencies, the U&CF program provides support for ongoing, critical developments in urban ecosystem management through improvements in urban forest policy, planning, assessment, tree planting, technical standards, education, budgets, and financial management. Education activities include support for the Treeture environmental education program through a partnership with the International Society of Arboriculture, the National Tree Trust, and American Forests. To assist with building local community forest management capabilities, technical and financial assistance is currently provided to more than 11,600 communities annually.

Grants made available through Federal funding from U&CF totaled more than $9.9 million in 1997 to support a full range of program development activities from the national to the local level. Matching grants generate more than $49.1 million in private donations of cash, goods, and services for all activities supporting tree planting, care, and protection, approximately a 5:1 ratio of private to Federal financing of urban and community forestry activities.

Economic Action Programs

A collection of long- and short-term programs together make up a strategic overall effort to help communities and businesses that depend on natural resources to pursue self-sufficiency and sustainability. Through Economic Action Programs, the Forest Service provides technical and financial assistance to more than 3,240 rural communities and businesses that are adversely affected by change in availability of natural resources or in natural resource policy. Of the total number assisted, more than 130 were tribal and minority communities.

Rural Community Assistance

The Forest Service implements the national strategy on rural development in coordination with USDA's Rural Development mission area and other State and Federal agencies. The goal is to strengthen rural communities by helping them diversify and expand their economies through the wise use of natural resources. In FY 1997, the Forest Service initiated an outcomes measurement process for rural community capacity building; over 150 communities have established indicators and measures to determine progress.

Economic Recovery is a long-term program that targets areas with acute economic problems associated with changes in Federal land management policies and natural resource decisions. The purpose of the effort is to assist eligible natural-dependent areas to diversify by developing new or different economic activities. In FY 1997, over 600 eligible communities received technical and financial assistance, training, and education to help them diversify their forest-based economies. Of these communities over 530 are taking action based on locally led strategic plans.

Rural Development is a long-term program that provides technical and financial assistance to help strengthen, diversify, and expand local economies, especially those experiencing long-term or persistent economic problems. Rural Development is a grant program that provides technical assistance and matching funds for locally initi-

ated and planned projects. They are designed to stimulate improvements in the economic, environmental, or social well-being of rural citizens through forest resources.

A short-term emphasis is the Pacific Northwest Assistance effort, which supports the diversification of local economies experiencing reductions in Federal timber harvest levels. This effort provides technical and financial assistance to over 900 communities. It is part of a larger, multi-agency effort to target resources to rural areas facing acute economic problems. Over 90 percent of these Forest Service funds are granted directly to the communities, counties, and tribes for community-identified projects to meet local needs. About 7.5 percent of the funds goes into agency technical assistance. In addition, for every dollar of Forest Service funding, over $2 is leveraged from partners.

The Forest Products Conservation and Recycling Program continually provides a cadre of Federal forest products technology transfer specialists trained in logging, sawmilling, drying, processing, marketing, engineering, and wood technology. This assistance directly affects communities and businesses that foster conservation and ecosystem health through proper utilization of forest products. In FY 1997, over 1,100 technical assists were provided and over 90 workshop presentations made, leading directly and indirectly to over 100 jobs being created or retained. This work is supported by regional and State specialists as well as a Technology Marketing Unit at the Forest Products Laboratory in Madison, WI.

The Wood in Transportation Program improves rural transportation networks and demonstrates the commercial potential of using wood from undervalued tree species for bridges and other transportation structures in rural communities. This demonstration program has built market value for these species, which in turn stimulates economic return and value for protecting the forest and its ecosystems. In FY 1997, 14 structures were funded, leveraging over $772,000, with nearly a 2:1 ratio of private to Forest Service funding. More than 57,000 pieces of technical information were requested and disseminated to local and State officials responsible for transportation infrastructure.

Natural Resource Conservation Education

The Forest Service supports a lifelong learning process that promotes the understanding of ecosystems and natural resources—their relationships, conservation, use, management, and values to society. Our large partnership base assists the Natural Resource Conservation Education (NRCE) program in about 200 projects across the country each year, reaching about 2.4 million young people and more than 118,700 teachers. More than 40 separate program efforts are coordinated. They include Project Learning Tree, which reaches 400,000 teachers. The Forest Service budget is leveraged through a variety of organizations and groups to reach a 3.8:1 ratio of private to agency funds.

Smokey Bear: Smokey Bear has been spreading the forest fire prevention message for 54 years. The Forest Service began a fire prevention program during World War II, and in 1944, a bear was introduced as the program symbol. Smokey is one of the most recognized symbols of fire prevention worldwide. Educational programs using Smokey Bear are delivered to people of all age groups and backgrounds. The

message is primarily oriented toward elementary school-age children. Almost every State has a Smokey suit that is used for a wide variety of fire prevention purposes, from school programs to parades. There is a Smokey Bear hot air balloon that is displayed at events across the Nation.

Woodsy Owl: Woodsy Owl is a colorful and fanciful character designed to be especially appealing to young children. Woodsy is recognized by over 83 percent of all American households and is America's leading symbol for environmental improvement. Woodsy's appearance and message have recently been redesigned and revitalized. He now sports a backpack, hiking shoes, and field pants. His new slogan builds on his previous message: "Lend a hand—care for the land!" The Woodsy Owl campaign was officially launched by the Forest Service on September 15, 1971. In June 1974, Congress enacted a law establishing "Woodsy Owl"—with his slogan, "Give a hoot! Don't pollute!"—as a "symbol for a public service campaign to promote wise use of the environment and programs that foster maintenance and improvement of environmental quality."

Smokey Bear

Woodsy Owl

Wildland Fire Management

The Wildland Fire Management program protects life, property, and natural resources on the 191.6 million acres of NFS lands. An additional 20 million acres of adjacent State and private lands are also protected through fee or reciprocal protection agreements. Wildland fire activities are conducted with the highest regard for public and firefighter safety.

Preparedness provides the basic fire organization and the capability to prevent forest fires and take prompt, effective initial attack suppression action on wildfires.

In FY 1997, 1.1 million acres of NFS lands received Hazardous Fuel Treatment to reduce the amount of hazardous fuels (combustible carbon from trees, understory growth, etc.). This was a 120-percent increase over the 1987-1996 average of 0.5 million acres. Fuel treatment benefits the health of the forest and can reduce the danger of catastrophic wildfire.

Suppression Operations provide for the suppression of wildfires on or threatening NFS lands or other lands under fire protection agreement.

In 1997, over 7,800 fires burned approximately 129,000 acres of NFS and other protected lands. The annual average is approximately 11,500 fires burning on 634,000 acres.

Cooperative Fire Protection

The Cooperative Fire Protection (CFP) program provides technical and financial assistance to State and volunteer fire departments to aid in the protection of over 1 billion acres of State and private lands.

The State Fire Assistance component of this program protects natural resources from fire on State and private lands. This is done through fire prevention efforts, training and equipping fire organizations, and aggressive initial attack to keep wildland fire ignitions small. Federal funds are cost-shared with State and local funds and help augment State protection needs. State and local fire organizations, capable of quickly and efficiently extinguishing wildland and wildland/urban interface fires, reduce risk to public safety, prevent resource loss, and help contain costs of fire suppression.

The Volunteer Fire Assistance component of the CFP improves the ability of America's 26,000 rural fire departments to protect lives, property, and natural resources in rural and wildland/urban interface areas. The focus of the Federal assistance is to provide adequate fire and personal safety equipment, provide training, and to organize new fire departments in unprotected communities.

Federal Excess Personnel Property is acquired by the Forest Service and loaned to State forestry agencies and their cooperators, rural fire departments, for wildland and rural community fire protection. In 1997, 11,271 excess property items valued at $128,008,876 were acquired and placed in service in the United States. In the past 42 years, this program has saved taxpayers of the United States over $1 billion.

Research and Development

Forests are critical to the global environment and the global economy. They are the source of food, raw material, shelter, and income for millions, and they provide sanctuary for people and habitat for wildlife. Forests filter and protect water supplies and absorb carbon dioxide from the atmosphere. Agency research and development activities are conducted in areas requiring urgent policy and management action, including studies related to watershed health and restoration, sustainable forest management, economic and social values, and forest health.

Since its establishment in 1976, Forest Service Research and Development has become the world's single largest source of natural resource information. It includes:

- About 550 scientists working on the productivity, health, and diversity of the temperate, boreal, and tropical forests;
- Six regional experiment stations and one national Forest Products Laboratory comprising 63 research lab locations, many collocated with universities;
- Eighty-three experimental forests and ranges and 370 research natural areas devoted to long- term research;
- An extensive portfolio of long-term research data bases, some more than 60 years old; and
- Gateways for collaborative research in the Tropics, through the International Institute of Tropical Forestry in Puerto Rico and the Institute of Pacific Islands Forestry in Hawaii.

The Forest Service Research and Development Program provides:

- Scientific information to natural resource managers, other scientists, and the public through more than 2,600 publications per year and many presentations at symposia and workshops,
- Collaboration with university, industry, and other scientists; nongovernmental organizations; managers; and policymakers for work that transcends the abilities of any single organization,
- More than $17 million per year in domestic grants, cooperative agreements, and contracts for research partnerships, and
- Key data bases for enhancing forest health, productivity, and conservation, including an extensive portfolio of long-term research data bases with many more than 60 years old.

The Forest Service provides scientific and technological information to manage the Nation's forests and associated ecosystems. This includes studies in vegetation management, watersheds, fisheries, wildlife, forest products and recycling, insects and diseases, economics, forest and rangeland ecology, silviculture, fire ecology, fire prevention, ecosystem functioning, and recreation.

Priority research items include:

- Forest inventories, which were conducted on 47 million acres of forest lands across all ownerships in 1998, with status and trends reported in 90 inventory reports. In 1998 forest inventory and analysis is planned for 25 States and forest health monitoring in 32 States.
- Recycling and wood use, to solve technical problems that hinder wastepaper recycling and to develop new products from agricultural and wood fibers and byproducts.
- Research to support the sustainable management of forests, including evaluation of how climate interacts with pollution, drought, and forest health.
- Large-scale ecosystem studies that support the conservation and restoration of watersheds, for example protecting watersheds, riparian zones, and biological diversity in the Rio Grande Basin and the Upper Columbia River Basin.
- Research to provide habitat management information and guides for more than 70 threatened, endangered, and sensitive species, and to help define the impacts of forest fragmentation on wildlife.
- Research to support early eradication of non-native invasive insects, diseases, and weeds; for example, information on the biology of Asian longhorned beetles supports successful control of this introduced pest in New York, and newly developed DNA markers for viral control agents provide more efficient and cost-effective control of Asian gypsy moth.

Business Operations—Acquisition Management

The agency spent nearly $900 million in over 728,000 actions for goods and services in FY 1998. Over 69 percent of the total procurement dollars were awarded to small businesses. Awards included more than $52 million to small disadvantaged businesses and $32 million to women-owned small business firms. Forest Service dollars benefited States, research, international organizations, and other organizations

through a variety of grants and cooperative agreements totaling more than $414 million. This expenditure is not included in the figures cited above. The agency managed approximately 22 million square feet of owned office and related space plus 6 million square feet of agency leased and General Services Administration- controlled space with an annual rental of $62 million. The Forest Service also manages approximately 4,000 units of living quarters for employees valued at $375 million. Property managers oversee more than $2.7 billion worth of Forest Service personal property, including property on loan to State forestry departments. The agency supports the President's initiative on recycling with emphasis on both procurement of and efficient disposal of recyclable materials. The agency national strategy for waste prevention and recycling is available via the Internet's World Wide Web at: *http://www.fs.fed.us/land/recycle.html*.

Senior, Youth, and Volunteer Programs

Senior, Youth, and Volunteer Programs provide job opportunities, training, and education for the unemployed, underemployed, elderly, young, and others with special needs, while benefiting high-priority conservation work. In FY 1998, these programs included more than 125,600 participants and accomplished over $109 million in conservation work on Forest Service lands.

Through an agreement with the U.S. Department of Labor, the Forest Service operates 18 Job Corps Civilian Conservation Centers on Forest Service lands. The Job Corps program is the only Federal residential education/training program for the Nation's disadvantaged youth.

Key Facts About Job Corps Civilian Conservation Centers:

- *18 Job Corps Centers, 17 co-ed*
- *9,373 enrolled, ages 16-24*
- *$98.6 million budget*
- *17.2 million work accomplishment*
- *82 percent placed*
- *Average starting salary, approximately $7.00 per hour*
- *45 percent minorities*

The **Senior Community Service Employment Program** is designed to provide useful part-time employment and training for persons age 55 and over.

Key Facts About the Senior Community Service Employment Program:

- *5,484 older workers participated*
- *$28.4 million budget*
- *$40.7 million work accomplishment*
- *Only Federal agency among 10 national sponsors*
- *44 percent females*
- *24 percent placed in unsubsidized employment*
- *$1.43 return on dollar invested*

In the **Youth Conservation Corps** summer employment program, persons age 15-18 accomplish projects that further the development and conservation of the United States' natural resources.

Key Facts About the Youth Conservation Corps:

- *594 enrollees, ages 15-18*
- *$1.8 million operating costs*
- *$1.6 million work accomplishment*
- *$.88 return on dollar invested*
- *43 percent females*

The **Volunteers in the National Forests** program allows organizations and individuals to donate their talents and services to help manage the Nation's natural resources.

Key Facts About Volunteers in the National Forests:

- *98,271 volunteers have participated (including 105 international volunteers and 265 Touch America Project volunteers, ages 14-17)*
- *$38.3 million work accomplishment*
- *33 percent females*
- *Over 1.3 million volunteers served since the 1972 legislation*

Hosted programs provide conservation training and work opportunities on national forests or in conjunction with Federal programs. Programs are administered through agreements with State and county agencies, colleges, universities, Indian tribes, and private and nonprofit organizations.

Key Facts About Hosted Programs:

- *11,976 participants*
- *$11.3 million work accomplishment*
- *30 percent females*
- *24 percent minorities*

Office of International Programs

The Forest Service promotes technical cooperation and develops support for sustainable forest management practices worldwide. In addition, many individual research relationships exist between Forest Service researchers and managers and their counterparts around the world.

The Office of International Programs (IP) is divided into three program areas: technical cooperation, policy, and disaster assistance support. Partners include other U.S. Government agencies, as well as international organizations such as the International Tropical Timber Organization and the Food and Agriculture Organization of the United Nations. In addition, IP has developed numerous country-specific partnerships that promote training and technical exchange and tap into the diversity of experience within the Forest Service.

IP is involved with a wide variety of activities. Some examples from 1997 include: organizing a workshop on nontimber forest products in Central Africa; facilitating research to combat invasive pests in the United States; and coordinating Forest Service technical participation in response to drought, flood, and fire disasters in Africa, Asia, and Latin America.

In addition, long-term partnerships include working with the Partners in Flight program to support neotropical migratory bird habitat restoration in Mexico, working with the Federal Forest Service of Russia to advance the ability of their fire ecologists and managers to more effectively use fire as a management tool, and working with the Indonesians to develop mapping technology for land management.

In the policy area, IP is working to develop criteria and indicators for international and forest level monitoring. Further policy work includes issue briefs that explore current issues affecting international and domestic forestry. Other efforts include providing Incident Command System training to foreign firefighters so that they are prepared to deal with wildfires when they arise, and promoting reduced impact harvesting techniques through a network of forestry research organizations.

Since October 1997, over 100 Forest Service employees representing each of the 10 regions as well as research stations have been involved in international forestry work. They have participated in international forestry meetings, conducted assessments of disaster situations, coordinated interagency response teams, and conducted original research. The partnerships that have developed and that are being encouraged enable a great exchange of ideas and techniques, which lead to more sustainable forestry practices, in this country and abroad.

Law Enforcement and Investigations

The objective of the Forest Service law enforcement program is to provide for public and employee safety, and to protect natural resources and property within the authority and jurisdiction of the Forest Service. The program focuses on activities such as vandalism, archaeological resource violations, timber theft, wildland arson, and the cultivation and manufacture of illegal drugs.

Forest Service drug control efforts continue to focus on the detection, apprehension, and prosecution of persons responsible for illegal drug activities on the forests. Drug enforcement efforts annually result in the seizure of several million dollars'

Key Facts About the Impact of International Programs:

- *Through involvement with industry, State foresters, and major nongovernmental organizations, 12 countries forged a consensus on a set of criteria and indicators for assessing progress towards sustainable forest management.*
- *International collaboration on research and monitoring help to reduce the impact of invasive pests such as the Asian gypsy moth and hemlock woolly adelgid, which have severe impacts on timber resources.*
- *Partnerships with organizations such as Ducks Unlimited to restore waterfowl habitat will increase the populations of waterfowl that migrate to the Western and Southwestern United States from Mexico and further south.*
- *A program with the Federal Forest Service of Russia, the State of Alaska, and U.S. companies and nongovernmental organizations will help to ensure that Russians have access to the best environmental technology as petroleum resources on Sakhalin Island are developed. This will promote increased employment in Alaska and preserve salmon fisheries around Sakhalin Island and Alaska.*

worth of assets and the seizure and destruction of nearly $1 billion worth of marijuana and other drugs.

In FY 1998, 520 cooperative law enforcement agreements enhanced cooperation with State and local law enforcement agencies and with other Federal agencies to increase the protection and service to forest visitors. About 160 drug enforcement agreements were set up between the Forest Service, State and local law enforcement agencies, and other Federal agencies or task forces to cooperate in eliminating illegal drug activities in the National Forest System.

Key Facts About Law Enforcement and Investigations:

- *Nearly 290,000 incidents or criminal violations were reported and handled by Forest Service (FS) officers in FY 1998. These violations resulted in many millions of dollars in damages and losses to FS property and natural resources.*
- *Nearly 338,000 marijuana plants valued at over $1.0 billion were eradicated from approximately 3,900 sites. Officers and agents made over 2,800 arrests for drug-related offenses, seized nearly $12 million in processed marijuana, and seized over $4.8 million dollars in assets. There were 14 incidents of assault, 23 incidents of intimidation, and 174 firearms seized in relation to drug activities.*
- *About 460 uniformed officers and 135 criminal investigators performed investigation and enforcement activities unique to the FS, the resources, and its nearly 191 million acres.*

The Natural Resources Conservation Service

Introduction

As USDA's lead private lands conservation agency, the Natural Resources Conservation Service (NRCS) provides technical assistance and administers a wide range of programs to help solve this country's natural resource problems.

Our well-being depends on healthy, productive natural resources and their sustainable use. Just as soil, water, and habitat are interrelated, the programs that address these resources are interrelated, and programs that help one resource also benefit others. If you stop erosion, for example, you also enhance soil productivity and protect water and air quality. Improving the environment enhances the economic future of communities throughout the United States.

The mission of NRCS is to provide national leadership, in a partnership effort, to help people conserve, improve, and sustain the Nation's natural resources and environment.

A Partnership Approach to Resource Conservation

For more than six decades, NRCS employees have worked side by side with landowners, conservation districts, Resource Conservation and Development Councils, State and local governments, and urban and rural partners to restore and enhance the American landscape. The agency helps landowners and communities take a comprehensive approach in conservation planning, working toward an understanding of how all natural resources—soil, water, air, plants, animals—relate to each other and to humans. The agency works to solve the natural resource challenges on the Nation's private lands—reducing soil erosion, improving soil and rangeland health, protecting water quality and supply, conserving wetlands, and providing fish and wildlife habitat.

Most NRCS employees serve in USDA's network of local, county-based offices, including those in Puerto Rico and the Pacific Basin. The rest are at State, regional, and national offices, providing technology, policy, and administrative support. They serve all people who live and work on the land. Nearly three-fourths of the agency's technical assistance goes to helping farmers and ranchers develop conservation systems uniquely suited to their land and their ways of doing business.

The agency helps rural and urban communities curb erosion, conserve and protect water, and solve other resource problems. American Indian tribes, Alaska Natives, Pacific Islanders, and other native groups work with NRCS on a variety of initiatives that include resource inventories and the adaptation of conservation programs to fit the special needs of their people and their land. Also, countries around the globe seek NRCS advice on building their own conservation delivery systems and in coping with severe natural resource problems.

NRCS Conservation Technical Assistance

NRCS provides conservation technical assistance (CTA) to improve and conserve natural resources. This assistance is based on voluntary local landowner cooperation.

CTA is the foundation upon which NRCS delivers its services, through local conservation districts, to private landowners, communities, and others who care for natural resources. CTA is the intellectual capital of the agency; experts in soils and other physical and biological sciences, with knowledge of local conditions, work with private landowners in the stewardship of our natural resources.

CTA provides the infrastructure through which the agency is able to respond to a multitude of needs, from natural resource disasters to complex site specific natural resource problems. CTA is the means by which this Nation is able to voluntarily bring about land stewardship that improves our soil, water, wildlife, and air resources while providing for sustainable agricultural production. The investments in CTA return the American public significant benefits from an improved environment and quality of life to a safe and abundant food supply.

NRCS Programs

Following is an overview of NRCS programs:

Wetlands Reserve Program

The Wetlands Reserve Program is a voluntary program to restore wetlands. Participating landowners can establish conservation easements of either permanent or 30-year duration or can enter into restoration cost-share agreements where no easement is involved. In exchange for establishing a permanent easement, the landowner receives payment up to the agricultural value of the land and 100 percent of the restoration costs for restoring the wetland. The 30-year easement payment is 75 percent of what would be provided for a permanent easement on the same site and 75 percent of the restoration cost. The restoration cost-share agreements are for a minimum 10-year duration and provide for 75 percent of the cost of restoring the involved wetlands.

Environmental Quality Incentives Program

The Environmental Quality Incentives Program works primarily in locally identified priority areas where there are significant natural resource concerns, such as soil erosion, water quality and quantity, wildlife habitat, wetlands, and forest and grazing lands. Priority is given to areas where State or local governments offer financial, technical, or educational assistance, and to areas where agricultural improvements will help meet water quality objectives. Activities must be carried out according to a conservation plan. The program offers financial, educational, and technical help to install or implement structural, vegetative, and management practices called for in 5- to 10-year contracts. Cost sharing may pay up to 75 percent of the costs of certain conservation practices. Nationally, half of the funding for this program is targeted to livestock-related natural resource concerns and the remainder to other significant conservation priorities.

Wildlife Habitat Incentives Program

The Wildlife Habitat Incentives Program provides financial incentives to develop habitat for fish and wildlife on private lands. Participants agree to implement a wildlife habitat development plan, and USDA agrees to provide cost-share assistance for the initial implementation of wildlife habitat development practices. USDA and program participants enter into 5- to 10-year cost-share agreements for wildlife habitat development.

Farmland Protection Program

The Farmland Protection Program provides assistance to State, tribal, or local government entities to help purchase development rights to keep productive farmland in agricultural use. USDA joins with State, tribal, or local governments, working through their existing programs, to acquire conservation easements or other interests from landowners. USDA provides up to 50 percent of the costs of the easements. To qualify, farmland must: be part of a pending offer from a State, tribe, or local farmland protection program; be privately owned; have a conservation plan; be large enough to sustain agricultural production; be accessible to markets for what the land produces; have adequate infrastructure and agricultural support services; and have surrounding parcels of land that can support long-term agricultural production.

Soil Surveys

The year 1999 marked the centennial of the soil survey in the United States — perhaps the largest and most valuable natural resource database in the world. NRCS conducts soil surveys cooperatively with other Federal agencies, land-grant universities, State agencies, and local units of government. Soil surveys provide the public with local information on the uses and capabilities of their soil resource. Soil surveys are based on scientific analysis and classification of the soils, and are used to determine land capabilities and conservation treatment needs. The published soil survey for a county or designated area includes maps and interpretations with explanatory information that is the foundation of resource policy, planning, and decisionmaking for Federal, State, county, and local community programs. Soil survey mapping has been completed on more than 90 percent of the Nation's private land, 48 percent of Indian lands, and 47 percent of public lands. In addition, over 700 soil surveys have been digitized and made available for resource assessments.

Snow Survey and Water Supply Forecasts

NRCS field staff collect snow information through a network of about 655 Snow Telemetry (SNOTEL) and 1,100 manual snow courses to provide 13 western States with water supply forecasts. The data are collected, assembled, and analyzed to make about 6,300 annual water supply forecasts, which provide estimates of available annual yield, spring runoff, and summer stream flow. Snowmelt provides approximately 80 percent of the streamflow in the West. Water supply forecasts are used by individuals, organizations, and State and Federal agencies to make decisions relating to agricultural production, fish and wildlife management, flood control, recreation, power generation, and water quality management.

Plant Materials Centers

NRCS employees at 26 Plant Materials Centers assemble, test, and encourage increased plant propagation and usefulness of plant species for biomass production, carbon sequestration, erosion reduction, wetland restoration, water quality improvement, streambank and riparian area protection, coastal dune stabilization, and to meet other special conservation treatment needs. The work is carried out cooperatively with State and Federal agencies, universities, commercial businesses, and seed and nursery associations. After species are proven effective for conservation purposes, they are released to the private sector for commercial production. NRCS has released almost 400 varieties of conservation plants to commercial producers. Nearly 250 improved varieties are now in commerical production and used in conservation programs. Forty-two new plants have been released since 1997.

Small Watersheds Projects

The Small Watershed Program works through local government sponsors and helps participants solve natural resource and related economic problems on a specific watershed. Project purposes include watershed protection, flood prevention, erosion and sediment control, water supply, water quality, fish and wildlife habitat enhancement, wetlands creation and restoration, and public recreation in watersheds of 250,000 or fewer acres. Both technical and financial assistance are available.

Emergency Watershed Protection

The Emergency Watershed Protection (EWP) program is designed to reduce threats to life and property in the wake of natural disasters. It provides technical and cost-sharing assistance. Assistance includes establishing vegetative cover; installing streambank protection devices; removing debris and sediment; and stabilizing levees, channels, and gullies. In subsequent storms, EWP projects protect homes, businesses, highways, and public facilities from further damage. Floodplain easements under EWP may be purchased to help prevent future losses due to natural disasters.

Watershed Operations

Under the Flood Control Act of 1944, NRCS is authorized to administer watershed works of improvement. Flood prevention operations include planning and installing improvements and land treatment measures for flood prevention; for the conservation, development, utilization, and disposal of water; and for the reduction of sedimentation and erosion damages. This may also include the development of recreational facilities and the improvement of fish and wildlife habitat. Activities are authorized in 11 specific flood prevention projects covering about 35 million acres in 11 States.

Watershed Surveys and Planning

NRCS cooperates with other Federal, State, and local agencies in conducting river basin surveys and investigations, flood hazard analysis, and flood plain management assistance to aid in the development of coordinated water resource programs, including the development of guiding principles and procedures. Cooperative river basin studies are made up of agricultural, rural, and upstream water and land

resources to identify resource problems and determine corrective actions needed. These surveys address a variety of natural resource concerns including water quality improvement, opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, and water needs for fish, wildlife, and forest-based industries. Flood plain management assistance includes the identification of flood hazards and the location and use of wetlands. NRCS represents USDA on river basin regional entities and River Basin Interagency Committees for coordination among Federal Departments and States.

Forestry Incentives Program

The Forestry Incentives Program supports good forest management practices on privately owned, nonindustrial forest lands nationwide. The program is designed to benefit the environment while meeting future demands for wood products. Eligible practices are tree planting, timber stand improvement, site preparation for natural regeneration, and related activities. The program is available in counties designated by a Forest Service survey of eligible private timber acreage.

Resource Conservation and Development Program

The Resource Conservation and Development Program (RC&D) provides a framework for local people to join together to improve their community's economy, environment, and living standards. RC&D areas are locally organized, sponsored, and directed. USDA provides technical and financial assistance and helps sponsors secure funding and services from Federal, State, and local sources. The major emphasis is environmental conservation and rural development. Currently, there are 315 RC&D areas covering more than 75 percent of the United States. Each year, these locally organized and directed areas create thousands of new jobs, protect thousands of miles of water bodies, conserve hundreds of thousands of acres of land, and improve the quality of life in hundreds of communities.

RC&D areas are run by a council of volunteers who serve without pay. Currently more than 20,000 people donate 78,000 days per year to improve their communities through this program. USDA provides a person to work full time with each area to help implement local objectives.

Other Activities

National Resources Inventory

Every 5 years, NRCS develops an inventory on the condition and trends of natural resources on non-Federal land. The National Resources Inventory, (NRI) contains the most comprehensive and statistically reliable data of its kind in the world. It measures trends in soil erosion by water and wind, wetland losses, prime farmland acreage, irrigation, habitat and conservation treatment at national, regional, State, and sub-State levels.

Conservation of Private Grazing Land Initiative

The Conservation of Private Grazing Land Initiative will ensure that technical, educational, and related assistance is provided to those who own private grazing lands. The Nation's more than 600 million acres of private grazing lands produce food and fiber, hold and carry important water resources, and offer wildlife habitat and recreational opportunities.

National Conservation Buffer Initiative

In April 1997, Agriculture Secretary Dan Glickman announced a new public-private partnership called the National Conservation Buffer Initiative. The goal is to help landowners install 2 million miles of conservation buffers by the year 2002.

Conservation buffers are areas or strips of land maintained in permanent vegetation and designed to intercept pollutants. Buffers can be installed along streams or in uplands—within crop fields, at the edge of crop fields, or outside the margins of a field.

The National Conservation Buffer Initiative is a multi-year effort led by the Natural Resources Conservation Service (NRCS) in cooperation with other USDA agencies, State conservation agencies, conservation districts, agribusinesses, and agricultural and environmental organizations. Seven national agricultural corporations pledged nearly $1 million over 3 years to complement USDA's efforts to promote conservation buffers.

To date, more than 2 million acres—or about 720,000 miles—of buffers have been established under the Conservation Reserve Program, Environmental Quality Incentives Program, Wetlands Reserve Program, and other USDA programs. Agricultural producers and other landowners who install buffers can improve soil, air, and water quality; enhance wildlife habitat; restore biodiversity; and create scenic landscapes.

International Programs

NRCS helps improve the management and conservation of natural resources globally. Participation in collaborative efforts with other countries results in benefits to the United States and in accomplishment of the NRCS mission. During fiscal year 1998, NRCS specialists completed 253 assignments to 49 countries. The objectives of the assignments were to provide short- and long-term technical assistance and leadership for the development of natural resource conservation programs and projects and exchange conservation technology with countries that face soil and water conservation issues similar to those in this country.

NRCS provided opportunities for approximately 205 foreign nationals from more than 25 countries to gain a better understanding of natural resource conservation activities by observing and discussing conservation programs in the United States.

Agricultural Air Quality

The 1996 Farm Bill established a Task Force on Agricultural Air Quality to make recommendations to the Secretary of Agriculture with regard to the scientific basis for agriculture's impact on air quality. The Task Force is charged with strengthening and coordinating USDA air quality research efforts to determine the extent to which agricultural activities contribute to air pollution and to identify cost-effective ways in which the agricultural industry can improve air quality.

Backyard Conservation Campaign

In 1998, NRCS developed a national Backyard Conservation campaign to tell non-farm audiences about the good conservation work being done by America's farmers and ranchers. The campaign features 10 common conservation practices, such as composting, mulching, tree planting, nutrient management, and water conservation, and shows how miniature versions can work in just about any backyard—whether measured in acres, feet, or flower pots.

Farmers and ranchers are already making progress in natural resource conservation by protecting and restoring wetlands, enhancing wildlife habitat, and reducing soil erosion. There are nearly 2 billion acres of land in the United States. Most of that land, 1.4 billion acres, is managed by farmers and ranchers. However, more than 92 million acres are privately developed, and much of this land is tended by homeowners. These homeowners can join the conservation tradition right in their own backyards to curb water pollution and improve wildlife habitat.

For more information on this campaign or agency programs, visit the NRCS web site at *http://www.nrcs.usda.gov*

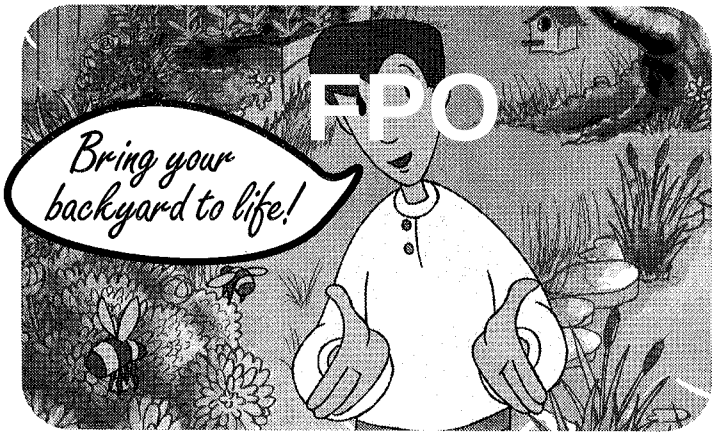
Clean Water Action Plan

USDA worked with State and local governments and other Federal agencies to continue implementation of the President's Clean Water Action Plan. In March 1999, USDA and the U.S. Environmental Protection Agency released the United National Strategy for Animal Feeding Operations (AFO's). The strategy established a national performance expectation that all AFO's will develop and be implementing comprehensive nutrient management plans by 2009. This goal will be accomplished primarily through voluntary efforts of AFO owners and operators, with technical and financial assistance from NRCS, other USDA agencies, other Federal agencies, State and local entities, and the private sector.

A series of Federal-tribal regional workshops to assist tribes with their unified watershed assessments and watershed restoration action strategies also took place. In FY 1999, producers completed installation of 6,100 animal waste management systems with NRCS assistance.

BACKYARD CONSERVATION

It'll grow on you.



For years, farmers and ranchers have used conservation practices to save natural resources and improve wildlife habitat. For a free booklet on how you can use some of these same practices in your own backyard – whether you have acres, feet, or a few flower pots –

Call 1-888-LANDCARE

Ask for the Backyard Conservation Booklet.

This is a cooperative project of:
USDA Natural Resources Conservation Service
National Association of Conservation Districts
Wildlife Habitat Council

For More Information

Forest Service

Office of Communications Director
George Lennon
2Cen-Aud
Washington, DC 20250
202-205-8333
FAX 202-205-0885
glennon@fs.fed.us

Media Program Manager
Pete Pierce
2Cen-Aud
Washington, DC 20250
202-205-1294
FAX 202-205-0885
ppierce01@fs.fed.us

Program Manager
Carl Holguin
2Cen-Aud
Washington, DC 20250
202-205-1780
FAX 202-205-0885
cholguin@fs.fed.us

Program Manager
Christine Murray
2Cen-Aud
Washington, DC 20250
202-205-1545
FAX 202-205-0885
cmurray@fs.fed.us

Program Manager
Mary Jane Senter
2Cen-Aud
Washington, DC 20250
202-205-1719
FAX 202-205-0885
msenter@fs.fed.us

Freedom of Info Act Officer
Naomi Charboneau
1012-RPE
Arlington, VA 22209
703-605-4910
FAX 703-605-5104
ncharbon@fs.fed.us

FS Regional Communication Offices

Northern Region
Ed Nessellroad
P.O.Box 7669–Federal Building
Missoula, MT 59807
406-329-3089
FAX 406-329-3411
enesselroad/r1@fs.fed.us

Rocky Mountain Region
Steve Deitemeyer
P.O.Box 25127–11177 W.8th Ave
Lakewood, CO 80225
303-275-5135
FAX 303-275-5366
sdeitemeyer/r2@fs.fed.us

Southwest Region
Carolyn Bye
517 Gold Avenue, SW, Fed.Bldg.
Albuquerque, NM 87l02
505-842-3290
FAX 505-842-3457
cbye/r3@fs.fed.us

Intermountain Region
Robert Swinford
324 25th St. Federal Building
Ogden, UT 84401
801-625-5347
FAX 801-625-5240
bob.swinford/r4@fs.fed.us

Pacific SW Region
Marilyn Hartley
630 Sansome Street
San Francisco, CA 94111
415-705-2804
FAX 415-705-1097
mhartley/r5@fs.fed.us

Pacific NW Region
Al Matecko
P.O.Box 3623 - 333 S. First St
Portland, OR 97208
503-808-2971
FAX 503-808-2229
amatecko/r6@fs.fed.us

Southern Region
Angela Coleman
1720 Peachtree Rd, NW
404-347-7226
FAX 404-347-3808
Atlanta, GA 30367
acoleman/r8@fs.fed.us

Eastern Region
Sherry Wagner
310 W. Wisconsin Ave., Rm 500
Milwaukee, WI 53203
414-297-3640
FAX 414-297-3608
swagner/r9@fs.fed.us

Alaska Region
Pamela Finney
P.O.Box 21628 - Federal Bldg.
Juneau, AK 99802-1628
907-586-8803
FAX 907-586-7892
pfinney/r10@fs.fed.us

NE Area State-Private
John Pasquantino
11 Campbus Boulevard, Suite 200
Newtown Square, PA 19703
610-557-4142
FAX 610-557-4177
jpasquan/na@fs.fed.us

FS Research Stations Communications Offices
Forest Products Laboratory
Susan Paulson (Acting)
One Gifford Pinchot Drive
Madison, WI 53705-2398
608-231-9249
FAX 608-231-9592
skpaulson/fpl@fs.fed.us

North Central Research Station
Debra Dietzman
1992 Folwell Avenue
St. Paul, MN 55108
612-649-5031
FAX 612-649-5285
ddietzman/nc@fs.fed.us

Northeastern Research Station
Deidra L. McGee
11 Campus Boulevard, Suite 200
Newton Square, PA 19073
610-557-4112
FAX 610-975-4200
dmcgee/ne@fs.fed.us

Pacific NW Research Station
Sherri Richardson
P.O.Box 3890
Portland, OR 97208-3890
503-808-2137
FAX 503-326-2455
sherri.richards/r6pnw@fs.fed.us

Pacific SW Research Station
Connie Gill
2400 Washington Ave.
Redding, CA 96001
530-242-2465
FAX 530-242-2460
cgill/psw@fs.fed.us

Rocky Mtn. Research Station
Rick Fletcher (Ft. Collins)
240 W. Prospect Road
Fort Collins, CO 80526-2098
970-498-2340
FAX 970-498-1660
charlesr.fletcher/rmrs@fs.fed.us

Dave Tippets (Ogden)
324 25th Street, Federal Bldg.
Ogden, UT 84401
801-625-5434
FAX 801-625-5129
dtippets/rmrs,ogden@fs.fed.us

Southern Research Station
Carol Ferguson
P.O.Box 2680
Asheville, NC 28802
704-257-4389
FAX 704-257-4330
carol.ferguson/srs@fs.fed.us

Natural Resources Conservation Service

Acting Director, Conservation Communications Staff
Henry C. Wyman
Rm 6121-S
Washington, DC 20013
202-720-3210
FAX 202-720- 1564
henry.wyman@ca.usda.gov

Program Assistant
Joyce Hawkins
Rm 6121-S
Washington, DC 20013
202-720-3210
FAX 202-720-1564
joyce.hawkins@usda.gov

Public Affairs Specialist
Mary Cressel
Rm 6121-S
Washington, DC 20013
202-690-0547
FAX 202-690-1221
mary.cressel@usda.gov

Public Affairs Specialist
June Davidek
Rm 6121-S
Washington, DC 20013
202-720-3876
FAX 202-720-1564
june.davidek@usda.gov

Visual Information Specialist
Robert Gresh
Rm 6109-S
Washington, DC 20013
202-720-3933
FAX 202-720-9975
robert.gresh@usda.gov

Public Affairs Specialist
Fred Jacobs
Rm 6121-S
Washington, DC 20013
202-720-4649
FAX 202-690- 1221
fred.jacobs@usda.gov

Public Affairs Specialist
Jeannine Kenney
Rm 6114-S
Washington, DC 20013
202-720-6794
FAX 202-690-1221
jeannine.kenney@usda.gov

Public Affairs Specialist
Ted Kupelian
Rm 6121-S
Washington, DC 20013
202-720-5776
FAX 202-690-1221
ted.kupelian@usda.gov

Public Affairs Specialist
Tom Levermann
Rm 6116-S
Washington, DC 20013
202-720-7570
FAX 202-690- 1221
tlevermann@usda.gov

Visual Information Specialist
Chris Lozos
Rm 6121-S
Washington, DC 20013
202-720-4244
FAX 202-690- 1221
chris.lozos@usda.gov

Public Affairs Specialist
Diana Morse
Rm 6121-S
Washington, DC 20013
202-720-4772
FAX 202-690-1221
diana.morse@usda.gov

Printing Specialist
Doug Wilson
Rm 6116-S
Washington, DC 20013
202-720-6243
FAX 202-720-6009
doug.wilson@usda.gov

Freedom of Info Act Office
Wilda Grant
5601 Sunnyside Avenue
Beltsville, MD 20705-5000
301-504-2168
FAX 301-504-2161
wilda.grant@usda.gov

Natural Resources Conservation Service State Public Affairs Contacts

AL
Joan Love Smith
665 Opelika Road,
Auburn, AL 36830-0311
334-887-4530
334-887-4551
joan.smith@al.nrcs.usda.gov

AK
Jeanette Colville
949 East 36th Avenue, Suite 400,
Anchorage, AK 99508-4362
907-271-2424
907-271-3951
jeanette.colville@ak.nrcs.usda.gov

AZ
Mary Ann McQuinn
3003 North Central Avenue, Suite 800,
Phoenix, AZ 85012-2945
602-280-8778
602-280-8809
mmcquinn@az.nrcs.usda.gov

AR
Sonja Coderre
700 West Capitol Avenue,
Little Rock, AR 72201-3228
501-301-3133
501-301-3189
scoderre@ar.nrcs.usda.gov

CA
Anita Brown
430 G Street, Suite 4164,
Davis, CA 95616-4164
530-792-5644
530-792-5791
anita.brown@ca.usda.gov

CO
Petra Barnes
655 Parfet Street, Room E200C,
Lakewood, CO 80215-5517
303-236-2886, ext 216
303-236-2896
pbarnes@co.nrcs.usda.gov

CT
Carolyn Miller, Acting
16 Professional Park Road,
Storrs, CT 06268-1299
860-487-4029
860-487-4054
carolyn.miller@ct.nrcs.usda.gov

DE
Paul Petrichenko
1203 College Park Drive, Suite 101,
Dover, DE 19904-8713
302-678-4178
302-678-0843
ppetrichenko@de.nrcs.usda.gov

FL
Dorothy Staley
2614 N.W. 43rd Street,
Gainesville, FL 32606-6611
352-338-9565
352-338-9574
dstaley@fl.nrcs.usda.gov

GA
Pat Hood-Greenberg
Federal Building,
Box 13, 355 East Hancock Avenue,
Athens, GA 30601-2769
706-546-2272
706-546-2120
pat.hood- greenberg@ga.usda.gov

HI
Lynn Howell
300 Ala Moana Boulevard, Room 4316,
Honolulu, HI 96850-0002
808-541-2600, ext 118
808-541-2652
lhowell@hi.nrcs.usda.gov

ID
Sharon Norris
9173 W. Barnes Drive, Suite C,
Boise, ID 83705-4711
208-378-5725
208-378-5735
snorris@id.nrcs.usda.gov

IL
Paige Mitchell Buck
1902 Fox Drive,
Champaign, IL 61820-7335
217-353-6606
217-353-6675
paige.mitchell@il.nrcs.usda.gov

IN
Michael McGovern
6013 Lakeside Boulevard,
Indianapolis, IN 46278-2933
317-290-3222, ext 324
317-290-3225
mmcgovern@in.nrcs.usda.gov

IA
Lynn Betts
693 Federal Building, 210 Walnut Street,
Des Moines, IA 50309-2180
515-284-4262
515-284-4394
lynn.betts@ia.nrcs.usda.gov

KS
Mary Shaffer
760 South Broadway,
Salina, KS 67401
785-823-4571
85-823-4540
mary.shaffer@ks.nrcs.usda.gov

KY
Lois Jackson
771 Corporate Drive, Suite 110,
Lexington, KY 40503-5479
606-224-7372
606-224-7399
ljackson@kystate.ky.nrcs.usda.gov

LA
Herb Bourque
3737 Government Street,
Alexandria, LA 71302-3727
318-473-7762
318-473-7682
hbourque@las02.la.nrcs.usda.gov

ME
Elaine Tremble
5 Godfrey Drive, Orono,
ME 04473
207-990-9100
207-990-9599
etremble@me.nrcs.usda.gov

MD
Carol Hollingsworth
John Hanson BC, 339 Bucsh's Frontage
Road, Suite 301,
Annapolis, MD 21401-5534
410-757-0861
410-757-0687
carol.hollingsworth@md.usda.gov

MA
Wendi Kroll
451 West Street,
Amherst, MA 01002-2995
413-253-4371
413-253-4375
wendi.kroll@ma.usda.gov

MI
Christina Coulon
301 Coolidge Road, Suite 250,
East Lansing, MI 48823-6350
517-324-5244
517-324-5171
ccoulon@miso.mi.nrcs.usda.gov

MN
Sylvia Rainford
600 Farm Credit Building,
375 Jackson Street,
St. Paul, MN 55101-1854
651-602-7859
651-602-7914
str@mn.nrcs.usda.gov

MS
Jeannine May
Federal Building, Suite 1321,
100 West Capitol Street,
Jackson, MS 39269-1399
601-965-4337
601-965-4536
jbm@ms.nrcs.usda.gov

MO
Norm Klopfenstein
Parkade Center, Suite 250,
601 Business Loop, 70 West,
Columbia, MO 65203-2546
573-876-0911
573-876-0913
norm.klopfenstein@mo.usda.gov

MT
Lori Valadez
406-587-6842
406-587-6761
lvaladez@mt.nrcs.usda.gov
Federal Building, Room 443,
10 East Babcock Street,
Bozeman, MT 59715-4704

NE
Pat McGrane
Federal Building, Room 152,
100 Centennial Mall, North,
Lincoln, NE 68508-3866
402-437-5328
402-437-5327
pat.mcgrane@ne.usda.gov

NV
Liz Warner
5301 Longley Lane,
Building F, Suite 201,
Reno, NV 89511-1805
775-784-5288
775-784-5939
lwarner@nv.nrcs.usda.gov

NH
Vacant
Federal Building, 2 Madbury Road,
Durham, NH 03824-2043
603-868-7581
603-868-5301

NJ
Irene Lieberman
1370 Hamilton Street, Somerset, NJ
08873-3157
732-246-1171
732-246-2358
irene.lieberman@nj.usda.gov

NM
Betty Joubert
6200 Jefferson Street, NE, Suite 305,
Albuquerque, NM 87109-3734
505-761-4406
505-761-4463
betty.joubert@nm.usda.gov

NY
Vacant
441 South Salina Street,
5th Floor, Suite 354,
Syracuse, NY 13202-2450
315-477-6524
315-477-6550

NC
Andrew Smith
4405 Bland Road, Suite 205,
Raleigh, NC 27609-6293
919-873-2107
919-873-2156
asmith@nc.nrcs.usda.gov

ND
Arlene Deutscher
Federal Building, Room 278,
220 East Rosser Avenue,
Bismarck, ND 58502-1458
701-530-2099
701-530-2112
ajd@nd.nrcs.usda.gov

OH
Latawnya Dia
614-255-2471
614-469-2083
latawnya.dia@oh.nrcs.usda.gov
200 North High Street, Room 522,
Columbus, OH 43215-2748

OK
Terri Daniel (Acting)
100 USDA, Suite 203,
Stillwater, OK 74074-2624
405-742-1244
405-742-1201
terri.daniel@ok.nrcs.usda.gov

OR
Gayle Norman
101 SW Maine Street, Suite 1300,
Portland, OR 97204-3221
503-414-3236
503-414-3103
gnorman@or.nrcs.usda.gov

PACBAS
Marie Mundheim
FHB Building, Suite 301, 400 Route 8,
Maite, GU 96927
671-472-7375
671-472-7288
marie1@ite.net

PA
Stacy Mitchell
1 Credit Union Place, Suite 340,
Harrisburg, PA 17110-2993
717-237-2208
717-237-2238
smitchell@pa.nrcs.usda.gov

PR
Becky Fraticelli
IBM Building, 6th Fl,
654 Munoz Riveria Ave.,
Hato Rey, PR 00918-4123
787-766-5206
787-766-5987
becky@pr.nrcs.usda.gov

RI
Jeanne Comerford
60 Quaker Lane, Suite 46,
Warwick, RI 02886-0111
401-828-1300
401-828-0433
jcomerford@ri.nrcs.usda.gov

SC
Perdita Belk
Strom Thurmond FB, 1835
Assembly Street, Room 950,
Columbia, SC 29201-2489
803-765-5402
803-253-3670
pbelk@sc.nrcs.usda.gov

SD
Joyce Watkins
Federal Building, Room 203,
200 4th Street, SW,
Huron, SD 57350-2475
605-352-1228
605-352-1261
joyce.watkins@sd.nrcs.usda.gov

TN
Larry Blick
675 U.S. Courthouse, 801 Broadway,
Nashville, TN 37203-3878
615-736-5490
615-736-7764
lblick@tn.nrcs.usda.gov

TX
Harold Bryant
W.R. Poage Federal Building,
101 South Main Street,
Temple, TX 76501-7682
254-742-9811
254-742-9819
harold.bryant@tx.usda.gov

UT
Ron Nichols
Wallace F. Bennett FB,
125 South State Street, Room 4402,
Salt Lake City, UT 84138
801-524-4556
801-524-4403
rnichols@ut.nrcs.usda.gov

VT
Anne Hilliard
69 Union Street, Winooski,
VT 05404-1999
802-951-6796
802-951-6327
ahilliard@vt.nrcs.usda.gov

VA
Pat Paul
Culpeper Building, Suite 209,
1606 Santa Rosa Road,
Richmond, VA 23229-5014
804-287-1681
804-287-1737
ppaul@va.nrcs.usda.gov

WA
Betty Schmitt
Rock Pointe Tower II, W.
316 Boone Avenue, Suite 450,
Spokane, WA 99201-2348
509-323-2912
509-323-2909
betty.schmitt@wa..usda.gov

WV
Peg Reese
75 High Street, Room 301,
Morgantown, WV 26505
304-284-7547
304-284-4839
preese@wv.nrcs.usda.gov

WI
Renae Anderson
6515 Watts Road, Suite 200,
Madison, WI 53719-2726
608-276-8732
608-276-5890
randerso@wi.nrcs.usda.gov

WY
Nancy Atkinson
Federal Building, 100 East B Street,
Room 3124, Casper, WY 82601-1911
307-261-6482
307-261-6490
nla@wy.nrcs.usda.gov

11. Research, Education, and Economics

Investing in the Future Through Agricultural Research, Education, and Economics

USDA leads the world in basic and applied research, as it looks for ways to solve problems challenging America's food and fiber production system, and for ways to improve food supply, safety and quality. Five major challenges face U.S. agriculture in the next decade: (1) maintaining an agricultural system that is highly competitive in the global economy; (2) providing a safe and secure food and fiber system; (3) maintaining a healthy, well-nourished population; (4) maintaining an agricultural system that protects natural resources and the environment; and (5) increasing economic opportunities and improving the quality of life of all Americans. USDA's Research, Education, and Economics (REE) mission area helps meet these challenges.

Four USDA agencies make up the mission area: the Agricultural Research Service (ARS); the Cooperative State Research, Education, and Extension Service (CSREES); the Economic Research Service (ERS); and the National Agricultural Statistics Service (NASS). Together, these agencies have the Federal responsibility to discover and disseminate knowledge that spans the biological, physical, and social sciences related to agricultural research, economic analysis, statistics, extension, and higher education.

REE serves people along the entire food and fiber chain—-from the farm gate to the consumer's kitchen table. Sound science provides new technology and information useful to Americans as well as people all over the world in their daily lives. The REE agencies develop new products and new uses, explore profitable marketing strategies, develop technologies to improve farming and processing efficiency, increase food safety, improve human nutrition, and conserve and enhance natural resources. Studies demonstrate that consumers reap the benefits of investing in agricultural research; every tax dollar invested in U.S. agricultural research has paid back at least $1.35. Information about the REE mission and its respective agencies—ARS, CSREES, ERS, and NASS—is available on the REE World Wide Web home page at *http://www.reeusda.gov/ree/*

Agricultural Research Service

The Agricultural Research Service (ARS) is the principal in-house research agency of the U.S. Department of Agriculture.

ARS research has contributed to improved crop yields and more environmentally sensitive farming techniques. But the impact of ARS research extends far beyond the farm gate. Today's agricultural research is as much about human health as it is about growing corn.

For example, a powerful but expensive anti-cancer drug has become more plentiful, thanks to a new process developed by ARS scientists. The process makes the drug—called taxol—from lab-cultured cells of its increasingly rare natural source, the yew tree. The new process is 100 times more productive than the original process for deriving taxol, which was patented by USDA in 1991. Taxol is a potent chemotherapy drug for breast, ovarian, lung, and other cancers. Under the original process, it took about 6,700 pounds of bark from rare yew trees to make a pound of taxol.

ARS research is also as much about development of new products as it is about development of new crop varieties. One environmentally friendly product now on the market grew out of ARS research showing that adding alum to poultry litter helps reduce runoff of nutrients from the litter into groundwater and surface waterways. The alum reduces phosphorus runoff by 70 percent, reduces the litter's ammonia vapors—which can physically damage the chickens and cause respiratory problems for poultryhouse workers—and reduces heavy metal runoff such as copper, zinc, and iron by up to 50 percent. The ARS-patented technology is now used by poultry growers across the United States and in Canada.

On the crops side, a new potato variety known as AWN86514-2 is highly resistant to attack by late blight, the disease that caused the Irish potato famine of the 1840's. Late blight is caused by a fungus, *Phytophthora infestans*. New, more aggressive strains of the fungus that are fungicide-resistant have appeared in recent years, so breeders have been scrambling to find potatoes with natural resistance. The new potato held up well in tests when attacked by the newest and most virulent strains of the fungus. That's good news for consumers, because the average American eats about 143 pounds of potatoes a year, making potatoes the Nation's favorite vegetable. ARS released the new potato in collaboration with agricultural experiment stations in Oregon, Idaho, and Washington.

ARS research provides solutions to a wide range of problems related to agriculture—problems that require long-term commitment of resources or that are unlikely to have solutions with a quick commercial payoff that would tempt private industry to do the research. These problems range from fighting the ongoing battle to protect crops and livestock from costly pests and diseases, to improving quality and safety of agricultural commodities and products for humans, to making the best use of natural resources. All the while, the research results must help ensure profitability for producers and processors while keeping down costs for consumers.

National Agricultural Library

The National Agricultural Library (NAL) was established as part of the Department of Agriculture in 1862 under legislation signed by President Abraham Lincoln. Part of the Agricultural Research Service (ARS) of the U.S. Department of Agriculture, NAL is the largest agricultural library in the world with a collection of over 3.2 million items.

It is the mission of the National Agricultural Library to serve as the chief agricultural information resource of the United States, ensuring and enhancing access to agricultural information for a better quality of life.

The library serves national and international customers, including researchers, farmers, educators, policymakers, agricultural producers, and the general public. A

ARS Research: Selected Highlights

- *ARS scientists in Peoria, IL; New Orleans, LA; and Philadelphia, PA, have found a way to extract a health-enhancing oil from a waste byproduct of the corn processing industry. The scientific team started with corn fiber, a low-value byproduct of corn milling that's now sold as a low-cost ingredient in cattle feed. From that corn fiber, they've extracted an oil that, in tests with hamsters, lowered total serum cholesterol levels and LDL cholesterol, the type that clogs arteries. They've also extracted a second product from corn fiber, a white gum that could be used in a variety of products—in food as an emulsifier, a soluble dietary fiber or thickener, or industrial adhesives and water-based paint thickeners.*
- *The latest twist in alternatives to using chemical pest to combat crop pests is plants designed to give insects a stomach ache. ARS scientists teamed up with researchers at Kansas State University to insert an insect enzyme into rice plants. The enzyme—chitinase—causes digestive problems for insects that swallow it. Chitinase causes chitin, a key component in insect skin and gut tissue, to break down. In lab studies, the scientists found that the genetically engineered plants significantly suppressed the growth of feeding insect larvae. Insect chitinase in plants is harmless to humans or animals. Several agricultural biotechnology companies are working with the scientists to transform other plants, such as corn, sorghum, and wheat.*
- *ARS studies in Boston have shown that certain foods contain higher levels of compounds that could help slow the processes associated with aging in both body and brain. In the studies, eating plenty of foods with these beneficial substances, called antioxidants, raised the power of human blood to defuse harmful internal substances called oxidants by up to 25 percent. Fruits and vegetables found to have the highest amounts of these beneficial antioxidants were prunes, raisins, blueberries, blackberries, kale, strawberries, spinach, raspberries, brussel sprouts, plums and alfalfa sprouts.*
- *ARS research at the U.S. National Arboretum has yielded two new elm trees resistant to the Dutch elm disease that has ravaged the American elm population since the 1940's, wiping out an estimated 77 million trees. The two new disease-resistant elms from ARS are called Valley Forge and New Harmony. Also, ARS researchers recently unveiled two new maple trees for American streets and yards: "Red Rocket," a fiery-red maple cultivar with good pest resistance and the ability to grow where temperatures dip to 40 degrees below zero, and "New World," which also has pest and cold resistance and is an excellent shade tree as well as an ideal choice for city landscaping.*

- *ARS research on natural resources uncovered a reason to celebrate: American farmers have crossed an auspicious environmental boundary and begun reducing the level of atmospheric carbon dioxide rather than adding to it. CO2 is one of the greenhouse gases thought to cause global warming. The ARS study showed that U.S. farmers have shifted from being net producers of carbon dioxide to net accumulators of carbon, in the form of valuable soil organic matter. The changeover was due largely to farmers' increasing use of no-till or low-till techniques. Now, many farmers leave crop residue on or near the soil surface, where the residue readily decays into organic matter.*
- *For decades, USDA has battled scrapie, a fatal brain disease of sheep and goats. Now the first preclinical, noninvasive test for scrapie should be available in a few years as a result of ARS research. Reliable diagnosis of scrapie is the first step to eradicating the disease, which would greatly improve U.S. sheep and goat export opportunities. ARS scientists discovered that the nictitating membrane, or third eyelid, in sheep collects proteins known as prions. Abnormal prions are the infectious agents believed to cause scrapie. The researchers developed a new laboratory-built molecule, called a monoclonal antibody, that detects the presence of the abnormal prions. The test will eventually allow veterinarians to detect scrapie before animals show clinical signs.*
- *For more information about ARS, see its home page: http://www.ars.usda.gov*

key NAL goal is to become a "library without walls," a library whose collection and services are available electronically throughout the world. By adapting electronic information technology to its needs, the library is well on its way to meeting this goal with worldwide accessibility over the Internet.

Over 48 miles of bookshelves hold the NAL collection. Materials in the collection include the latest electronic resources as well as books, journals, reports, photographs, films, videotapes, maps, artwork, and historic materials dating to the 16th century. Tens of thousands of new items are added each year. The collection is international in scope and includes items in nearly 75 foreign languages.

The library is located in Beltsville, Maryland, on the grounds of the ARS Beltsville Agricultural Research Center. In addition to being the agricultural library for the Nation, NAL is also the departmental library for USDA, serving thousands of USDA employees around the globe. NAL is a key resource in USDA's scientific and research activities. NAL staff includes librarians, computer specialists, information specialists, administrators, and clerical personnel. Volunteers ranging from college students to retired persons work on various programs at NAL too. The library has an active visiting scholar program as well, which allows professors, scientists, and librarians from universities worldwide to intern at NAL on projects of mutual interest.

AGRICOLA is NAL's bibliographic database providing access to the NAL collection. AGRICOLA contains nearly 3.5 million citations to agricultural literature and is available on the Internet through the NAL homepage at *http://www.nal.usda.gov*

NAL provides reference and document delivery services in all aspects of agriculture. It also includes specialized information centers that provide customized information services on topics such as alternative farming systems, animal welfare, food and nutrition, technology transfer, rural development, and water quality.

For walk-in visitors, the library is open from 8:00 a.m. to 4:30 p.m., eastern time, Monday through Friday, except Federal holidays. Many of NAL's services are available at anytime through the NAL home page.

NAL can be contacted at:

- The National Agricultural Library
- Agricultural Research Service, USDA
- 10301 Baltimore Avenue
- Beltsville, MD 20705-2351
- (301) 504-5755
- e-mail: agref@nal.usda.gov

Cooperative State Research, Education, and Extension Service

The Cooperative State Research, Education, and Extension Service (CSREES) works with universities and other public and private organizations to advance research, extension, and higher education in the food and agricultural sciences and in related environmental and human sciences. Its programs increase and provide access to scientific knowledge, strengthen the capabilities of land-grant and other science and education institutions, expand accessibility and use of improved communication and network systems, and promote informed decisionmaking.

CSREES links the research and education resources and activities of USDA, improving customer service and responsiveness to emerging issues and national priorities. CSREES programs focus on improving economic, environmental, and social conditions in the United States and globally. These conditions include improved agricultural productivity and development of new products; safer food; cleaner water and air; enhanced stewardship and management of natural resources; healthier and more responsible individuals, families, and communities; and a stable, secure, diverse, and affordable food supply.

Partnership

The CSREES domestic and international research, education, and extension networks are strengthened with partnerships that maximize resources and program impact. An array of CSREES partners includes other USDA agencies, Federal and State government departments, nonprofit organizations, and private-sector entities. Working closely with the nationwide Land-Grant University System is central to CSREES programs. CSREES partners include:

- Over 130 colleges of agriculture, including land-grant institutions in each State and territory

NAL Selected Highlights:

- *AgNIC Growing*
  The Agricultural Network Information Center (AgNIC), an agricultural information system begun in 1996 by NAL and land-grant universities, continues to show significant growth. AgNIC links worldwide agricultural information networks, providing "one-stop shopping" to anyone searching the Web for agricultural information. In Fiscal Year 1999, AgNIC received nearly 18.5 million hits.
- *Access to Farming History Improved*
  Over 200 years of U.S. farming history can now be more easily identified and accessed through NAL efforts. The USDA history collection, dating to 1862 and before, was transferred to NAL in 1998. Since then, NAL has created a web site to improve access to the collection, as well as cataloged the items and taken steps to improve preservation of the collection.
- *Electronic Preservation Plans Developed*
  NAL has taken the lead in developing plans to preserve USDA electronic publications. USDA has made electronic formats the preferred method for releasing information to the public. Preservation and long-term access of these materials are an important issue due to the ephemeral nature of electronic formats. NAL has established a steering committee and several subcommittees that are addressing the issue and formulating preservation plans and procedures.
- *Food Safety Research Information Office Established*
  NAL has established a Food Safety Research Information Office. The office, mandated by the Agricultural Research, Extension, and Education Reauthorization Act of 1998, will provide information on food safety research initiatives to the research community and the general public.

- 59 agricultural experiment stations
- 57 State or territorial cooperative extension services
- 63 schools of forestry
- 16 1890 historically black land-grant institutions, and Tuskegee University
- 27 colleges of veterinary medicine
- 42 schools and colleges of family and consumer sciences
- 30 1994 Native American land-grant institutions
- 160 Hispanic-serving institutions
- Nonprofit organizations
- the private sector

Programs

CSREES research, education, and extension leadership is provided through programs in:

- Plant and Animal Systems
- Natural Resources and Environment
- Economic and Community Systems
- Families, 4-H, and Nutrition
- Partnerships
- Competitive Research Grants and Awards Management
- Science and Education Resources Development
- Communications, Technology, and Distance Education.

What Is CSREES?

- Development of knowledge leading to advancement in agriculture, the environment, community and individual well-being through problem-focused integrated research and education and targeted scientific efforts, including cutting-edge research programs on value-added product development, plant and animal genome mapping and biotechnology, integrated pest management, water quality, human nutrition, food safety, and animal and plant systems
- Model education programs in sustainable agriculture, water quality, food safety, risk management, children and families, health, environmental stewardship, distance education, and community economic development
- Higher education programs to develop the scientific and professional expertise needed to advance the food, agricultural, and natural resource systems and maintain excellence in college and university teaching programs
- Cooperative partnerships involving:
  —over 9,600 scientists engaged in research at 59 State agricultural experiment stations, 16 1890 colleges and universities, and Tuskegee University
  —over 9,600 local extension agents working in 3,150 counties
  —3 million trained volunteers working with national outreach education programs
  —6.5 million youth involved in 4-H programs that increase self-esteem and enhance problem-solving skills in a positive, supportive environment
- The National Research Initiative supporting research in the biological, physical, and social sciences to solve key agricultural and environmental problems
- A Small Business Innovation Research program to support high-quality research proposals containing advanced concepts related to important scientific problems and opportunities in agriculture that could lead to significant public benefit if the research is successful
- Immediate electronic access to vital information on safety and disaster recovery during time-critical disasters, such as hurricanes, wildfires, and floods

CSREES: Selected Highlights

- ***Easing Food Fears***
  Though cases of Salmonella food poisoning from eggs are rare, USDA-CSREES-funded research by Purdue, North Carolina State, and Texas A&M universities may make it nearly nonexistent. Purdue's low-temperature pasteurization process kills Salmonella on the egg shells without cooking the eggs. This process could increase the value of Indiana's egg industry alone by $40 million. Texas A&M researchers have also reduced the incidence of Salmonella in chickens by 75 percent by boosting young chicks' immune systems in a method similar to vaccinating humans against disease.
- ***Increasing Successes and Reducing Failures***
  Introducing and developing new plant varieties continues to boost the likelihood of success when farmers plant, grow, and harvest their crops. For example, USDA-CSREES has helped fund a rice breeding program at the University of Arkansas which has released 11 varieties of rice since 1980. These new varieties have increased the average yield by 1,700 pounds per acre in 1998, with an estimated value of $88 million annually. Two recently introduced varieties, Drew and Kaybonnet, are resistant to the State's two most costly diseases. With these varieties, growers can cut production costs by as much as $70 per acre by eliminating the need for chemical disease control.
- ***Adding Value***
  Finding ways to turn trash into treasure or adding new value to familiar products often makes the competitive difference in agriculture. For example, University of Florida researchers—with research funds from USDA-CSREES—developed a breakthrough biotech bacterium that became the basis for a new ethanol plant in Louisiana. The $90 million factory will use the patented, genetically modified bacteria to break down bagasse–an otherwise waste byproduct from sugar production–to produce ethanol. Also, a Colorado State University alternative crop specialist with support from USDA-CSREES has developed a canola-based motor oil which works just as well as the petroleum version but without the environmental drawbacks. The oil is about the same weight as 10w30, cuts hydrocarbon emissions by a third, and can be disposed of without environmental concern.

- ***Solving Local Problems Locally***
  In partnership with the land-grant network of extension specialists in nearly every county linked to regional and national expertise at colleges and universities, USDA-CSREES helps citizens overcome problems and make the most of opportunities close to home. In the first year of a Louisiana State University extension energy management program for school districts, for example, participating schools saved an average of 12 percent from their energy costs, for a total of more than $3.5 million. In New York City, a Cornell University program to improve landlord-tenant communications and promote more responsible ownership has reduced building code violations. The program is being adopted in Oregon, Mississippi, California, Massachusetts, and Colorado.
- ***Environment-Friendly Farming***
  With help from USDA-CSREES and land-grant universities, farmers are modifying their practices to create greater harmony between agriculture and the environment. As competition for water increases, these farmers are finding new ways to prevent pollution and to conserve and reuse water resources. USDA and Georgia scientists and extension agents teamed up to develop an environmentally friendly cotton cropping system which increased conservation tillage in Georgia from 88,400 acres in 1994 to more than 200,000 acres in 1998. On these acres, less soil and sediments reach streams and there is more soil organic matter on the soil surface. Tennessee growers using residue management systems introduced by extension have reduced soil erosion by 20 million tons annually and sediments in streams and lakes by 10 million tons annually.
- ***Eating Well***
  Despite the safety and affordability of America's food supply, diet-related diseases are all too common; poor diets and nutrition contribute to five of the 10 leading causes of death, costing the U.S. economy an estimated $250 billion annually. To address this, USDA-CSREES and its land-grant university partners are improving the quality of the American diet and reducing health-care costs. For example, when the Food and Drug Administration recently revised its recommended daily allowance for folate or folic acid, the change was based largely upon CSREES-funded research at the University of Florida showing deficiencies in this vitamin could increase risk of anemia, birth defects, and heart disease. Since cell division depends on folate, adequate amounts of the vitamin are critical for normal fetal growth and development, while aging adults need it to repair cells. Also, Texas A&M University researchers with CSREES support found that fish oil combined with the kind of fiber found in oranges could

protect against cancer development. They also discovered a new, non-invasive way to detect changes in colon cells that may be an indicator of possible colon cancer.

- ***Working Beyond Welfare***
  Programs offered by USDA-CSREES and the land-grant system are helping people move off welfare and into the job market while managing their finances and limited food dollars. Arizona extension's PHASE program, for example, has helped more than 6,000 single parents and displaced homemakers in Pima County complete their education and find jobs. The program offers job-related scholarships, job-seeking skills, and job placements. CSREES' Expanded Food and Nutrition Education Program (EFNEP) reaches low-income people with information on healthy food choices and wise use of food dollars. In Louisiana, extension reached nearly 4,000 families and more than 9,000 youth with EFNEP information. Of these, 95 percent made positive dietary changes, increasing consumption of milk, fruits, and vegetables; 48 percent said they ran out of food less often before the month's end.
- ***Managing Pests***
  For more than 30 years, USDA-CSREES and its land-grant university partners have been working to develop, evaluate, and share new methods to control pests that damage crops and invade homes. New technologies and integrated pest management (IPM) strategies bring together cultural, genetic, biological, and chemical methods to effectively control insects and plant diseases with fewer pesticides, reduce crop production costs, and create a safer environment. Extension programs in Florida, Pennsylvania, Indiana, Texas, and New York, for example, are teaching school maintenance workers how to use IPM practices to reduce or eliminate pesticides in and around their schools. The number of school districts in Florida routinely spraying pesticides has dropped from 75 percent to 40 percent. Forty percent of Pennsylvania school districts also are now implementing IPM programs. In Vermont, extension specialists are helping apple growers implement IPM programs that reduce reliance on pesticides by as much as 50 percent. Apple IPM programs in Ohio, Massachusetts, New Hampshire, Virginia, and many other States are producing similar results.
- ***Water: Making the Most of Every Drop***
  In finding ways to prevent pollution and improve water quality, USDA-CSREES and land- grant experts are helping farmers and others adopt practices that protect water quality and make the most of every drop. Non-point sources of pollution, such as farm fields, cause billions of dollars in damage each year. Louisiana State University

researchers and extension experts studied the movement of soil, plant nutrients, herbicides, and insecticides in surface runoff from corn and sugarcane, and taught growers how to maintain profits while reducing the amount of herbicide in Louisiana surface waters. In Nebraska, SPLASH is an extension program which teaches irrigators one-on-one how to reduce water, energy, and fertilizer use. This program has saved 46.4 million gallons of water on about 35,000 acres irrigated by cooperators.

- ***Surviving and Thriving in the Global Marketplace***
  If there is one hot commodity that's already commanding a premium in the international marketplace, it's information that helps American farmers improve their bottom lines and lowers grocery bills for consumers. Research and education programs funded by USDA-CSREES are helping U.S. producers survive and thrive at a time when new trade agreements are altering the global landscape. For example, Illinois researchers have found that high-quality soybeans command higher prices in European and Japanese markets, and that some foreign buyers are now specifying oil and protein contents in their contracts. These studies provided producers with incentives to revise soybean grades for more than 60 percent of U.S. exports. An innovative cattle breeding project at Washington State University has built a herd of Wagyu cattle imported from Japan, after studies showed that the breed could be produced in the Pacific Northwest and its beef marketed in the United States and Japan at premium prices.

Economic Research Service

Food assistance programs. Climate change. Risk management. Trade liberalization. Water quality. Concentration in agricultural industries. Agricultural productivity. Nutrition. Exports of U.S. farm products. Rural population trends. Food safety concerns.

The economics of these topics and many more are analyzed by USDA's Economic Research Service (ERS), the Department's social science research agency. As such, ERS provides information and analysis that is used by public officials in developing, administering, and evaluating food, farm, conservation, and rural policies and programs, as well as by consumers, agribusinesses, and farm operators in their decisionmaking. ERS analysts monitor and evaluate many issues requiring policy decisions by the Administration and Congress.

The agency has four principal functions: research, development of economic and statistical indicators, situation and outlook analysis, and staff analysis.

ERS analyzes and monitors such areas as:

- Environmental issues.
- Nutrition education and food assistance, food safety regulation, determinants of consumer demand for quality and safety, and food marketing trends and developments.
- National and international commodity markets and production agriculture.
- The economic well-being of the rural economy, the financial performance of the farm sector, and the implications of changing farm credit and financial market structures.

ERS information is made available to the public through research publications, situation and outlook reports, e-mail and the World Wide Web, newspapers, magazines, radio, and frequent participation of ERS staff at public forums. ERS publishes several periodicals, including *Agricultural Outlook*, *FoodReview*, and *Rural America*.

The agency's products are available through a variety of formats. Printed reports can be ordered through the ERS-NASS sales desk at 1-800-999-6779. Studies, data bases, issue briefs, and other types of information are available on the ERS web site at *www.econ.ag.gov* and the ERS AutoFax system at 202-694-5700.

National Agricultural Statistics Service

The National Agricultural Statistics Service (NASS), "*The Fact Finders for U.S. Agriculture*," is the official data collection arm of the U. S. Department of Agriculture. The only way to "tell the story" of the phenomenal success of American agriculture is by having data available that measure productivity. Having accurate, timely information available is not only important to tell the success story of American agriculture, but it is vital to support the efficient handling of commodities in today's global market.

The NASS mission is to serve the basic agricultural and rural data needs of the people of the United States, those working in agriculture, and those living in rural communities by objectively providing important, usable, and accurate statistical information and services needed to make informed decisions.

The NASS program has successfully met many challenges over the last 138 years to provide data to meet demands from a multitude of data users. These data are geared toward producers to help them plan planting, feeding, breeding, and marketing programs. Other major uses of these statistical data include the following:

- Timely, accurate data are essential in establishing and maintaining a market place where price is determined by real facts rather than speculation and rumors.
- Sound data are needed for resolving environmental issues, rather than worst case scenarios.
- Exporters of American farm products rely on accurate information.
- Our transportation-storage industry relies on the statistics in its efforts to move agricultural products to market.
- Suppliers use the data to allocate the necessary inputs farmers need to grow their crops or raise livestock.

- Government policymakers rely on accurate data in their efforts to address natural disasters, crop insurance, and depressed farm prices.
- Other USDA agencies use the statistical data in accomplishing important programs for the Department, whether it be carrying out agricultural policy concerning farm program legislation, commodity programs, agricultural research, and rural development.

NASS headquarters is located in Washington, DC, and 45 State Statistical Offices cover more than 120 crops and 45 livestock items annually in the 50 States. Current and historical information is published in over 400 reports, which feature:

- Crop acreage, yield, production, and grain stocks;
- Livestock, dairy, and poultry production and prospects;
- Chemical use in agriculture, including post-harvest applications on selected crops;
- Labor use and wage rates;
- Farms and land in farms; and
- Prices, costs, and returns.

An abundance of agricultural information is available to data users through NASS programs. In addition to the information above, estimates on more specialized commodities, including hop stocks, mink, cherries, cranberries, hazelnuts, lentils, and peppermint oil are also available. The new nursery, equine, and aquaculture surveys have been enthusiastically endorsed by these three important industries. Most statistics are based on information gathered from producers surveyed through personal and telephone or face-to-face interviews or through mailed questionnaires. Other statistical reports are based on surveys of grain elevators, hatcheries, and other agribusinesses, as well as on administrative data such as livestock slaughter records.

Data collected from these varied sources are summarized by the NASS State offices and are sent to the agency's Agricultural Statistics Board in Washington, DC, whose members determine and issue State and national official reports.

Census of Agriculture

In 1997, NASS' statistics program was enhanced through the addition of the every 5-year census of agriculture, previously administered by the U.S. Department of Commerce's Census Bureau. This has broadened the scope of agricultural statistics available through the agency. Data from the 1997 Census of Agriculture were released electronically several months ahead of the normal release schedule on February 1 of 1999, and are now available in print, on CD-ROM, and on the Internet. In addition, following the census of agriculture release, NASS conducts special studies for aquaculture, horticulture, and irrigation. Every 10 years following the census of agriculture, NASS conducts the agricultural economics and land ownership survey which is the only source of data on agricultural land ownership, financing, and inputs by farm operators and landlords for each State.

The census is a complete accounting of U.S. agricultural production and the only source of uniform, comprehensive agricultural data for every county in the Nation. The 1997 Census of Agriculture results include data on land use and ownership, operator characteristics, crops, machinery and equipment, livestock, fertilizer, poultry, chemicals, market value of products, energy expenditures, irrigated land, production expenses, type of organization, farm programs, and corporate structure.

The NASS *Quick Facts* brochure published from the 1997 Census of Agriculture data "tells the story" of American agriculture at a glance.

How To Get More Information

All NASS reports are released at scheduled times, and the information is offered to the public in a variety of formats. The NASS table shows some methods by which NASS data can be accessed.

For More Information

Agricultural Research Service

Director, Information Staff
Sandy Miller Hays
Rm 2251
5601 Sunnyside Ave., Bldg. 1
Beltsville, MD 20705- 5128
301-504-1638
FAX 301-504-1648
shays@asrr.arsusda.gov

Current Info Branch Chief
Sean Adams
Rm 2210
5601 Sunnyside Ave., Bldg. 1
Beltsville, MD 20705-5129
301-504-1622
FAX 301-504-1641
sadams@asrr.arsusda.gov

Chief, Information Products
Ruth Coy
Rm 2234
5601 Sunnyside Ave., Bldg. 1 and Services Branch
Beltsville, MD 20705- 5130
301-504-1660
FAX 301-504-1641
rcoy@asrr.arsusda.gov

Nat'l Visitor Center Head
John Kucharski
Bldg 302, BARC-E,
Beltsville, MD 20705
301-504-9403
FAX 301-504-8069
nvc@asrr.arsusda.gov

Freedom of Info Act Officers
Valerie Herberger
5601 Sunnyside Ave., Bldg. 1
Rm 2248b
Beltsville, MD 20705-5128
301-504-1640
FAX 301-504-1648
vherberg@asrr.arsusda.gov

Stasia Hutchison
Rm 2248a
5601 Sunnyside Ave., Bldg. 1
Beltsville, MD 20705-5128
301-504-1655
FAX 301-504-1648
hutchisn@asrr.arsusda.gov

Field Offices

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Peoria, IL 61604
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309-681-6530
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Albany, CA 94710
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FAX 301-504-5472

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Freedom of Info Act Officers
Valerie Herberger
5601Sunnyside Ave., Bldg. 1
Rm 2248b
Beltsville MD 20705
301-504-1640
FAX 301-504-1648
vherberg@asrr.arsusda.gov

Stasia Hutchison
5601 Sunnyside Ave., Bldg. 1
Rm 2248a
Beltsville, MD 20705
301-504-1655
FAX 301-504-1641
hutchisn@asrr.arsusda.gov

NAL TDD/TTY
DCRC TDD/TTY
301-504-6856
202-720-3434

Information Centers Branch
Alvetta S. Pindell
304-NAL
Beltsville, MD 20705
30l-504-5414
FAX 301-504-6409
apindell@nal.usda.gov

Alternative Farming Systems Information Center
Jane Gates
304-NAL
Beltsville, MD 20705
301-504-5724
FAX 301-504-6409
jgates@nal.usda.gov

Animal Welfare Information Center
Jean Larson
304-NAL
Beltsville, MD 20705
301-504-5215
FAX 301-504-7125
jlarson@nal.usda.gov

Food and Nutrition Information Center
Ginny Hartmueller
304-NAL
Beltsville, MD 20705
301-504-5719
FAX 301-504-6409
fnic@nal.usda.gov

Rural Information Center
304-NAL
Beltsville, MD 20705
Patricia John
301-504-5372
FAX 301-504-5181
pjohn@nalusda.gov

Rural Information Center
DC area and International
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301-504-5547
All other U.S. calls
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Reference Section
Stan Kosecki
4th Fl.-NAL Beltsville, MD 20705
301-504-5204
FAX 301-504-6927
skosecki@nal.usda.gov

Reference Desk
Librarian on Duty
1Fl.-NAL Beltsville, MD 20705
301-504-5479
FAX 301-504-6927
agref@nal.usda.gov

Russian Wheat Aphids Project
Wayne Olson
100-NAL Beltsville, MD 20705
301-504-5204
FAX 301-504-6927
wolson@nal.usda.gov

Special Collections Program
Susan Fugate
3Flr-NAL Beltsville, MD 20705
301-504-6503
FAX 301-504-5675
speccoll@nal.usda.gov

Technology Transfer Information Center
Kathleen Hayes
4Flr-NAL Beltsville, MD 20705
301-504-6875
FAX 301-504-7098
khayes@nal.usda.gov

Water Quality Information Center
Joseph Makuch
4Flr-NAL Beltsville, MD 20705
301-504-6875
FAX 301-504-7098
jmakuch@nal.usda.gov

D.C. Reference Center
Vacant
Rm1052-S Washington, DC 20250
202-720-3434
FAX 202-720-3200
dcrc@nal.usda.gov

Global Change
Roberta Rand
Rm013NAL Beltsville, MD 20705
301-504-6684
FAX 301-504-7098
rrand@nal.usda.gov

Cooperative State Research, Education, and Extension Service

(CSREES is located at Waterfront Center, 800 9th Street, S.W.)

Director, Communication & Information Access
Terry Meisenbach
Rm 4306
Washington, DC 20250-2207
202-720-2677
FAX 202-690-0289
tmeisenbach@reeusda.gov

National Media Liaison
Marti Asner
Rm 4301
Washington, DC 20250-2207
202-720-8188
FAX 202- 690-0289
masner@reeusda.gov

Public Affairs Officer
Len Carey
Rm 4314
Washington, DC 20250-2207
202-720-1358
FAX 202-690-0289
lcarey@reeusda.gov

Public Inquiries
Joyce Tonigan
Rm 4000C
Washington, DC 20250-2207
202-690-1899
FAX 202-690-0289
jtonigan@reeusda.gov

Webmaster
202-720-4112
Rm 4302
Washington, DC 20250-2207
Joe Fulks
jfulks@reeusda.gov
FAX 202-690-0289

Freedom of Info Act Officers
Valerie Herberger
Rm 2248b
5601 Sunnyside Ave., Bldg. 1
Beltsville, MD 20705
301-504-1640
FAX 301-504-1648
vherberg@asrr.arsusda.gov

Stasia Hutchison
5601 Sunnyside Ave., Bldg. 1
Rm 2248a
Beltsville, MD 20705
301-504-1655
FAX 301-504-1641
hutchisn@asrr.arsusda.gov

Economic Research Service

Chief, Publishing & Communications
Adrie Custer
1800 M St., NW
Rm S2018
Washington,DC 20036-5831
202-694-5120
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John Snyder
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Freedom of Information Act Officers
Valerie Herberger
5601 Sunnyside Ave., Bldg. 1
Rm 2248b
Beltsville, MD 20705
301-504-1640
FAX 301-504-1648
vherberg@asrr.arsusda.gov

Stasia Hutchison
5601 Sunnyside Ave., Bldg. 1
Rm 2248a
Greenbelt, MD 20770
301-504-1655
FAX 301-504-1641
hutchisn@asrr.arsusda.gov

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12. Marketing and Regulatory Programs

Agricultural Marketing Service

When you visit the grocery store, you know you'll find an abundance and variety of top-quality produce, meats, and dairy products. If you're like most people, you probably don't give a second thought to the marketing system that brings that food from the farm to your table. Yet, this state-of-the-art marketing system makes it possible to pick and choose from a variety of products, available all year around, tailored to meet the demands of today's lifestyles. Millions of people—from grower to retailer—make this marketing system work. Buyers, traders, scientists, factory workers, transportation experts, wholesalers, distributors, retailers, advertising firms—in addition to the Nation's farmers—all help create a marketing system that is unsurpassed by any in the world. And USDA's Agricultural Marketing Service (AMS) helps make sure the U.S. marketing system remains world-class.

Services to Promote Quality: Grading, Quality Standards, and Certification

Wherever or whenever you shop, you expect good, uniform quality and reasonable prices for the food you purchase. AMS quality grade standards, grading, certification, inspection, and laboratory analysis are voluntary tools that industry can use to help promote and communicate quality and wholesomeness to consumers. Industry pays for these services and since they are voluntary, their widespread use by industry indicates they are valuable tools in helping market their products.

USDA quality grade marks are usually seen on beef, lamb, chicken, turkey, butter, and eggs. For many other products, such as fresh and processed fruits and vegetables, the grade mark isn't always visible on the retail product. In these commodities, the grading service is used by wholesalers, and the final retail packaging may not include the grade mark. However, quality grades are widely used—even if they are not prominently displayed—as a "language" among traders. They make business transactions easier whether they are local or made over long distances. Consumers, as well as those involved in the marketing of agricultural products, benefit from the greater efficiency permitted by the availability and application of grade standards.

Grading is based on standards, and standards are based on measurable attributes that describe the value and utility of the product. Beef quality standards, for instance, are based on attributes such as marbling (the amount of fat interspersed with lean meat), color, firmness, texture, and age of the animal, for each grade. In turn, these factors are a good indication of tenderness, juiciness, and flavor of the meat—all characteristics important to consumers. Prime, Choice, and Select are all grades familiar to consumers of beef.

Standards for each product describe the entire range of quality for a product, and the number of grades varies by commodity. There are eight grades for beef, and three each for chickens, eggs, and turkeys. On the other hand, there are 45 grades for cotton, 26 grade standards or specifications for dairy products, and more than 312 fruit, vegetable, and specialty product standards.

■ ***Facts about grading:***
From October 1997 through September 1998, USDA graded 30 percent of the shell eggs and 95 percent of the butter produced in the United States. Nearly 83 billion pounds of fresh fruits and vegetables and more than 11 billion pounds of processed fruits and vegetables received a USDA grade mark. Nearly all of the meat industry requests AMS grading services: USDA grades were applied to 83 percent of all beef, 91 percent of all lambs, 23 percent of all veal and calves, 69 percent of all turkeys, and 41 percent of all chickens and other poultry marketed in this country. USDA also graded more than 98 percent of the cotton and 97 percent of the tobacco produced in the United States. In addition 88 percent of the butter sold in consumer size packages is marketed bearing the USDA grade shield.

The food testing side of the AMS program has nine user-funded laboratories performing numerous microbiological, chemical, and physical analyses on a host of food and fiber commodities, including processed dairy products, meat, poultry, egg products, and fruits and vegetables. This testing supports AMS purchases for the National School Lunch Program and other domestic feeding programs, troop ration specifications for the Department of Defense, export of U.S. food to foreign countries, laboratory quality control and assurance programs, and testing for aflatoxin in peanut products.

In addition to grading and laboratory services, USDA provides certification services, for a fee, that facilitate ordering and purchase of products used by large-volume buyers. Certification assures buyers that the products they purchase will meet the terms of their contracts—with respect to quality, processing, size, packaging, and delivery. If a large buyer—such as a school district, hospital, or prison—orders huge volumes of a particular product such as catsup or processed turkey or chicken, it wants to be sure that the delivered product meets certain needs. Too much money is involved to risk getting tomato soup when you need catsup, and meals can't be postponed while the mistake gets corrected. Graders review and accept agricultural products to make sure they meet contract requirements and specifications set by private-sector purchasers. They also certify food items purchased for Federal feeding programs.

AMS has developed quality assurance (QA)services that include Hazard Analysis and Critical Control Point (HACCP) and International Organization for Standardization (IOS)-based programs. These programs ensure and document that companies' operations are in compliance with provisions of contracts and/or their own standards and procedures. QA services are voluntary, hourly fee-based, and

value-added. HACCP concepts and procedures have been recommended by the National Academy of Sciences for application in the food industry, and IOS procedures are becoming an international norm for some processes. Another Quality Assurance activity performed by AMS is the accreditation or certification of laboratories whose customers need the testing service of these laboratories to facilitate the export of U.S. products. In addition, AMS' laboratories are currently pursuing accreditation under IOS/IEC Guide 25, an internationally recognized guide for quality systems in laboratory operations.

AMS' Dairy programs conducts comprehensive evaluations of dairy and related products manufacturing plan facilities and equipment to assure their eligibility to receive grading service and display the grade shield on products. Associated with this service is a sanitary design evaluation service for processing equipment. Under this service, processors can have the sanitary aspects of the design and the cleanability of a machine or process evaluated prior to installation in their facility. A similar service is being developed by AMS for the meat and poultry industry.

Spreading the News

Farmers, shippers, wholesalers, and retailers across the country rely on AMS Market News for up-to-the-minute information on commodity prices and shipments. Market News helps industry make the daily critical decisions about where and when to sell, and what price to expect. Because this information is made so widely available, farmers and those who market agricultural products are better able to compete, ensuring consumers a stable and reasonably priced food supply.

AMS Market News reporters generate approximately 700 reports each day, collected from more than 100 U.S. locations. Reports cover local, regional, national, and international markets for dairy, livestock, meat, poultry, grain, fruit, vegetables, tobacco, cotton, and specialty products. Weekly, biweekly, monthly, and annual reports track the longer range performance of cotton, dairy products, poultry and eggs, fruits, vegetables, specialty crops, livestock, meat, grain, floral products, feeds, wool, and tobacco. Periodically, AMS issues special reports on such commodities as olive oil, pecans, peanuts, and honey.

USDA's commodity market information in Market News is easily accessible—via newspapers, television, and radio; printed reports mailed or faxed directly to the user; telephone recorders; electronic access through the Market News Communication System and the Internet; through electronic mail; and by direct contact with USDA reporters.

Buying Food: Helping Farmers, School Children, and Needy Persons

AMS serves both farmers and those in need of nutrition assistance through its commodity procurement programs. By purchasing wholesome, high-quality food products that are in abundance, AMS helps provide stable markets for producers. The Nation's food assistance programs benefit from these purchases, because these foods go to low-income individuals who might otherwise be unable to afford them.

Some of the programs and groups that typically receive USDA-purchased food include: children in the National School Lunch, Summer Food Service, and School

Breakfast Programs; Native Americans participating in the Food Distribution Program on Indian Reservations; older Americans through the Nutrition Program for the Elderly; and low-income and homeless persons through the Commodity Supplemental Food Program and the Emergency Food Assistance Program. In addition, USDA helps provide disaster relief by making emergency purchases of commodities for distribution to disaster victims.

Once USDA determines that a purchase is appropriate, AMS publicly invites bids, and makes sure that the food it purchases meets quality and nutrition standards. Often, AMS specifies that foods be low in fat, sugar, and sodium. Compliance with these requirements is ensured through testing in AMS laboratories. AMS only purchases products that are 100 percent domestic in origin.

Pesticides: Information and Records

The U.S. food supply is one of the safest in the world, but the public is still concerned about the effects of agricultural pesticides on human health and environmental quality. The Pesticide Data Program (PDP), which is administered by AMS, provides statistically reliable information on chemical residues found on agricultural commodities such as fresh and processed fruits and vegetables, grain, and milk. PDP is a Federal-State partnership where 10 participating States using uniform procedures collect and test these commodities. The information gained helps form the basis for conducting realistic dietary risk assessments and evaluating pesticide tolerances as required by the Food Quality Protection Act of 1996. The Environmental Protection Agency uses PDP data to address re-registration of pesticides. Other Federal agencies use the data to respond more quickly and effectively to food safety issues. PDP's data are also used to support the export of American commodities in the competitive global marketplace and to assess with integrated pest management activities.

AMS also administers the Federal Pesticide Recordkeeping Program, which requires certified private applicators to keep records of their restricted use pesticide applications for a period of 2 years. These records support collection of pesticide use data to help analyze agricultural pesticide use and are used by health care professionals when treating individuals who may have been exposed to a restricted use pesticide. AMS works with State pesticide regulatory agencies and Cooperative Extension Services to provide the regulatory and education aspects of the program.

Helping Farmers Promote Their Products

"The Touch...the Feel of Cotton...the Fabric of Our Lives," "Beef...It's What You Want," "Got Milk?." If you've watched television or read magazines lately, you've probably heard or read these slogans and others for a host of agricultural commodities. All of these promotional campaigns are part of the Research and Promotion Programs that AMS oversees.

Federal research and promotion programs, authorized by Federal legislation, are designed to strengthen the industry's position in the marketplace and to maintain and expand domestic and foreign markets. The programs are all fully funded by industry assessments. Board members are nominated by industry and appointed officially by the Secretary of Agriculture. AMS oversees the activities of the boards or councils and approves budgets, in order to assure compliance with the legislation.

Currently, there are research and promotion programs for beef, pork, cotton, fluid milk and dairy products, eggs, honey, mushrooms, potatoes, soybeans, watermelons, and popcorn.

But, while advertising is one part of these programs, product research and development is also a major focus. Wrinkle-resistant cotton and low-fat dairy products are just two examples of how these programs have benefitted consumers and expanded markets for producers.

New generic commodity promotion, research, and information legislation was enacted as part of the 1996 Farm Bill to make Federal promotion and research programs available to more commodities.

Marketing Orders: Solving Producers' Marketing Problems

Marketing agreements and orders help dairy, fruit, vegetable, and peanut producers come together to work at solving marketing problems they cannot solve individually. Marketing orders are flexible tools that can be tailored to the needs of local market conditions for producing and selling. They have the force of law, and are subject to USDA oversight.

Federal milk marketing orders, for example, establish minimum prices that milk handlers or dealers must pay to producers for milk, depending on how that milk is used—whether fluid milk, ice cream, cheese, or other storable product. Federal milk orders help build more stable marketing conditions by operating at the first level of trade, where milk leaves the farm and enters the marketing system. They assure that consumers will have a steady supply of fresh milk at all times.

Marketing agreements and orders also help provide stable markets for fruit, vegetable, and specialty crops like nuts and raisins, to the benefit of producers and consumers. They help farmers produce for a market, rather than having to market whatever happens to be produced. A marketing order may help an industry smooth the flow of crops moving to market, to alleviate seasonal shortages and gluts. In addition, marketing orders help maintain the quality of produce being marketed; standardize packages or containers; and authorize advertising, research, and market development. Each program is tailored to the individual industry's marketing needs.

Ensuring Fair Trade in the Market

AMS also administers several programs that ensure fair trade practices among buyers and sellers of agricultural products.

Fruit and Vegetable Programs, PACA Branch, administers the Perishable Agricultural Commodities Act (PACA), which promotes fair trading in the fresh and frozen fruit and vegetable industry. PACA extends to produce dealers, commission merchants, and brokers who operate subject to PACA and requires that these entities be licensed.

PACA provides for administrative disciplinary proceedings to be brought against licensees or unlicensed entities subject to PACA that commit unfair trade practices such as bribery, failing to account and make full payment promptly for purchases, misbranding, or making false or misleading statements for a fraudulent purpose. A finding of the commission of these violations could lead to a license revocation or suspension, or the imposition of a civil penalty. Under the PACA, partners in a part-

nership or major corporate officers, directors, and shareholders of a corporation whose PACA license has been suspended or revoked may be determined by the agency to be responsibly connected with the partnership or corporation. A determination of responsible connection will bar the person or firm from licensing and employment by any licensee or entity subject to license for a period of time. The person or firm determined to be responsibly connected has the right to a hearing to appeal that determination. PACA also provides administrative reparation proceedings by which the parties can resolve contract disputes resulting from the buying and selling of produce. Further, PACA provides statutory trust protection for unpaid produce suppliers, whose trust claims have priority over the claims of secured lenders if the debtor files for bankruptcy.

The fruit and vegetable industry needs the protections provided by PACA because of the highly perishable nature of the products involved. Trading in produce is considerably different than trading for a car, a computer, or even grain. When a vegetable grower does not get paid, the product usually cannot be reclaimed before it spoils–or before it has already been consumed. Further, the parties are often located across the country from each other, and the seller has no control over the produce once the produce leaves the seller's possession.

Although PACA was initiated to protect producers, it benefits consumers and the entire produce industry. Over the past decade, AMS has handled nearly 40,000 PACA complaints, not just from growers, but also from grower-agents, grower-shippers, brokers, wholesalers, retailers, and processors. PACA is funded by license fees paid by industry, but the bottom line is that fair trade and resolved disputes mean businesses of any size can operate in a better trade environment and consumers can get a wider choice of reasonably priced, high-quality fruits and vegetables.

The Federal Seed Act (FSA) protects everyone who buys seed by prohibiting false labeling and advertising of seed in interstate commerce. The FSA also complements State seed laws by prohibiting the shipment of seed containing excessive noxious weed seeds. Labels for agricultural seed must state such information as the kinds and percentage of seed in the container, percentages of foreign matter and weed seeds, germination percentage and the date tested, and the name and address of the shipper. USDA also tests seed for seed sellers and seed buyers on a fee-for-service basis to determine quality.

The Plant Variety Protection Act provides patent-like protection to breeders of plants that reproduce both sexually, that is, through seeds, and through tubers. Developers of new plant varieties can apply for certificates of protection. This protection enables the breeder to market the variety exclusively for 20 years and, in so doing, creates an incentive for investment in the development of new plant varieties. Since 1970, AMS' Plant Variety Protection Office has issued more than 4,000 certificates of protection.

The Agricultural Fair Practices Act allows farmers to file complaints with USDA or a U.S. District Court if a processor refuses to deal with them because they are members of a producers' bargaining or marketing association. The act makes it unlawful for handles to coerce, intimidate, or discriminate against producers because

they belong to such groups. USDA, with the cooperation of the Department of Justice, acts to preserve farmers' rights under this act.

Organic Certification

AMS is responsible for developing and implementing an organic certification program, which was authorized by the Organic Foods Production Act as part of the 1990 Farm Bill. Current estimates of organic retail sales total over $3.5 billion, and there are an estimated 12,000-15,000 farmers who describe their operations as organic.

The goals of the organic certification program are to:

- Establish national standards governing the marketing of certain products as organically produced,
- Assure consumers that organically grown products meet consistent standards, and
- Facilitate interstate commerce in fresh and processed food that is organically produced.

Under the act, a National Organic Standards Board was appointed in January 1992. Its job is to help develop standards for substances to be used in organic production.

In December 1997, USDA issued a proposed rule with a comment period that closed at the end of April 1998. USDA received 275,603 comments on the proposal. A revised proposal will be published in 2000 for further comment.

Direct Marketing and Wholesale Market Development

AMS continually seeks ways to help farmers and marketers improve the U.S. food marketing system. For example, AMS' Federal-State Marketing Improvement Program (FSMIP) provides matching funds to State Departments of Agriculture or other State agencies for marketing research or marketing service projects to improve marketing systems. The aim of the program is to reduce costs or identify new market opportunities for producers, ultimately benefiting consumers through lower food costs and more food choices. Projects include research on innovative marketing techniques, taking those research findings into the marketplace to "test market" the results, and developing State expertise in providing service to marketers of agricultural products. In FY 1998, the FSMIP program funded 24 projects in 18 States for $1.2 million.

The Wholesale and Alternative Markets Program works to improve the handling, processing, packaging, storage, and distribution of agricultural products. AMS researchers work with local governments and food industry groups to develop modern, efficient, wholesale food distribution centers and farmers markets. AMS also conducts research and outreach on alternative marketing channels for goods produced by small and limited-resource farmers and processors. Agricultural producers, producer groups, shippers, exporters, rural communities, carriers, and consumers all benefit from the analyses, technical assistance, and information.

■ ***Fact about farmers markets:***
USDA defines a farmers market as a group of farmers and vendors leasing or renting space in a common facility on a temporary basis, with an emphasis on the sale of fresh farm products, crafts, and other locally produced items. USDA estimates there are currently more than 2,700 farmers markets in the United States.

Efficient Transportation for Agriculture

An efficient transportation system allows consumers access to a wide variety of agricultural products and commodities produced beyond their own localities.

AMS, through its Transportation and Marketing Programs, conducts research on the logistical requirements and constraints involved in transporting and distributing U.S. agricultural products to destination markets by railroads, trucks, inland barges, and ocean vessels, and monitors the adequacy of existing infrastructure to support efficient commerce. The research reports and technical assistance provided by AMS transportation and marketing specialists are designed to help agricultural growers, processors, shippers, and exporters respond more effectively to emerging changes in both the domestic and international marketplace and are specifically targeted at the smaller grower, processor, shipper, or exporter who may lack easy access to relevant market research.

Produce Locally, Think Globally

To remain competitive in today's world, American agriculture has become more global, and AMS has striven to be a strong partner in expanding markets for U.S. agricultural products.

The AMS role in the international marketing of U.S. commodities centers on its quality grading and certification programs, which are user-fee funded. Grading involves determining whether a product meets a set of quality standards. Certification ensures that contract specifications have been met—in other words, that the buyer receives the product in the condition and quantity described by the terms of the contract. AMS commodity graders frequently support other USDA agencies involved in export assistance, including the Farm Service Agency and the Foreign Agricultural Service.

U.S. companies often request certification services when exporting to a country that has specific import requirements. Certification services provided by AMS help avoid rejection of shipments or delay in delivery once the product reaches its foreign destination. Delays lead to product deterioration and, ultimately, affect the image of U.S. product quality. AMS' Quality Systems Verification Program provides independent, third-party verification of a supplier's documented quality management system. The program was developed to promote world-class quality and to improve the international competitiveness of U.S. livestock and meat.

AMS also provides laboratory testing for exporters of domestic food commodities in keeping with sanitary and phytosanitary requirements of foreign countries. To date, this service has been requested by exporters of products destined for Japan, South Korea, and other Pacific Rim countries, South Africa, European Union member countries, and countries of the former Soviet Union.

For selected fruits, vegetables, nuts (including peanuts), and specialty crops imported into the United States, minimum quality requirements must be met. For the most part, however, firms importing agricultural products into the United States use grading services voluntarily. AMS graders are often asked to demonstrate commodity quality standards and grading procedures to foreign firms and governments.

In addition to grading and certification services, AMS market news offices provide information on sales and prices of both imports and exports. Today, U.S. market participants can receive market information on livestock and meat from Venezuela, New Zealand, Japan, Poland, and other Pacific Rim markets, Mexico, Canada, Australia, and New Zealand; fruits and vegetables from France, Great Britain, Bulgaria, Poland, Mexico, New Zealand, and Canada; ornamentals from Germany, France, and Mexico; dairy products from Eastern and Western Europe and Oceania; and a host of products from Ukraine, Kazakhstan, and Russia.

AMS participates in a number of international forums that aim to facilitate world agricultural trade and avoid potential trade barriers. Technical assistance has been provided to countries in Eastern and Central Europe, and elsewhere around the globe, to improve their marketing systems. With improved transportation, distribution, and marketing information systems, these countries will become better customers for U.S. food and fiber products.

Whether at home or abroad, AMS strives to help U.S. agriculture market its abundant, high-quality products. And AMS will continue to work to help U.S. agriculture market its products in growing world markets, while assuring U.S. consumers an abundant supply of high-quality, wholesome food at reasonable prices.

Animal and Plant Health Inspection Service: Protecting Agricultural Health and Productivity

Why are the farmers and ranchers of the United States able to produce so much food for the tables of America's consumers?

Of course, there's no simple answer. But one key to this plentiful supply of food can be summed up in a single phrase: "Healthy crops and livestock."

And this is no accident. America's agricultural health is a result of a team effort—good husbandry by farmers and ranchers plus an organized effort to control and eradicate pests and diseases and to prevent the entry of devastating foreign plagues.

Just like frosts, floods, and droughts, pests and diseases can wreak havoc on agricultural productivity, depressing farm incomes and driving up food costs for consumers in the process. While we may not be able to prevent weather-related disasters,

USDA plays a vital role in protecting our country's agricultural health. The result is a more abundant, higher quality, and cheaper food supply than is found anywhere else in the world.

If agriculture is this foundation of manufacture and commerce, there is perhaps no greater mission than making sure that foundation remains healthy and strong. With the advent of free trade initiatives, a global network of countries has agreed that valid agricultural health concerns—not politics, not economics—are the only acceptable basis for trade restrictions. In this environment, our country's agricultural health infrastructure will be our farmers' greatest ally in seeking new export markets.

Excluding Foreign Pests and Diseases

Agricultural Quarantine Inspection

Agriculture, America's biggest industry and its largest employer, is under constant threat of attack. The enemies are countless and often microscopic, and they gain access to our country in surprising ways. Their potential allies are every traveler entering the United States and every American business importing agricultural products from other countries.

Many passengers entering the United States don't realize that one piece of fruit packed in a suitcase has the potential to cause millions of dollars in damage to U.S. agriculture. Forbidden fruits and vegetables can carry a whole range of plant diseases and pests. Oranges, for example, can introduce diseases like citrus canker or pests like the Mediterranean fruit fly (Medfly).

Similarly, sausages and other meat products from many countries can contain animal disease organisms that can live for many months and even survive processing. Meat scraps from abroad could end up in garbage that is fed to swine. If the meat came from animals infected with a disease, such as African swine fever, classical swine fever, or foot-and-mouth disease (FMD), it could easily be passed to domestic swine, and a serious epidemic could result. An outbreak of African swine fever in U.S. hogs would drive up the price of pork to consumers, cost hundreds of millions of dollars to eradicate, and close many U.S. export markets.

USDA's Animal and Plant Health Inspection Service (APHIS) safeguards U.S. borders against the entry of foreign agricultural pests and diseases. At all airport terminals, seaports, and border stations, about 1,600 Plant Protection and Quarantine (PPQ) employees inspect international conveyances and the baggage of passengers for plant and animal products that could harbor pests or disease organisms. At international airports, detector dogs in APHIS' Beagle Brigade help find prohibited agricultural materials. PPQ officers also inspect ship and air cargoes, rail and truck freight, and package mail from foreign countries. At animal import centers, APHIS veterinarians check animals in quarantine to make sure they are not infected with any foreign pests or diseases before being allowed into the country.

The following table provides selected inspection and interception data:

FY	*1994*	*1995*	*1996*	*1997*	*1998*
Ships Inspected	53,270	52,661	52,974	52,348	50,778
Aircraft Inspected	451,342	401,741	410,318	461,927	422,735
Passengers and Crew Inspected	62,548,979	65,645,734	66,119,960	68,448,289	72,191,992
Interceptions of Plant Material	1,442,214	1,583,687	1,567,886	1,609,370	1,480,773
Interceptions of Pests	54,831	58,032	48,483	62,830	52,761
Interceptions of Meat/Poultry Products	281,230	223,392	264,001	294,674	331,616
Baggage Civil Penalties-Number	22,164	21,813	20,716	21,498	19,302
Baggage Civil Penalties-Amount of Fines	$1,186,310	$1,098,220	$1,080,000	$1,107,670	$1,004,725

From high-tech to a keen nose, APHIS uses a variety of means to safeguard American agriculture. PPQ officers augment visual inspection with some 130 x-ray units that help check passenger baggage and mail for prohibited agricultural materials. They also have enlisted trained detector dogs and their keen sense of smell to help sniff out prohibited fruit and meat. On leashes and under the constant supervision of their handlers, the friendly beagles in USDA's Beagle Brigade have checked the baggage of passengers arriving from overseas for 15 years. Currently, APHIS has about 48 canine teams at 21 airports, including 19 of America's 20 busiest international airports.

Preclearance—Checking at the Source

In addition to domestic exclusion efforts, APHIS has a corps of experts stationed overseas, sometimes with the help of APHIS officers on temporary duty, that bolsters the Nation's defenses against exotic pests and diseases. Often it is more practical and effective to check and monitor commodities for pests or diseases at the source through preclearance programs. APHIS has special arrangements with a number of countries for preclearance programs, which are summarized in the table.

International Programs

Through direct overseas contacts, International Services (IS) employees gather and exchange information on plant and animal health; work to strengthen national, regional, and international agricultural health organizations; and cooperate in international programs against certain pests and diseases that directly threaten American agriculture. Two of the latter are the MOSCAMED program—which combats Medfly infestations in Mexico and Guatemala—and a program to eradicate screwworms, a parasitic insect of warm-blooded animals. Screwworm flies lay their eggs on the edge of open wounds, and the developing larvae feed on the living flesh of the host. Left untreated, the infestation can be fatal.

Country	*Commodities*
Argentina	Apples & pears
Belgium	Flower bulbs
Brazil	Mangoes
Chile	Stonefruit, berries, grapes, cut flowers, cherimoya, kiwifruit, other fruits & vegetables
Costa Rica	Mangoes
Ecuador	Mangoes & melons (free zone)
Great Britain	Flower bulbs
Guatemala	Mangoes
Haiti	Mangoes
Ireland	Flower bulbs
Israel	Flower bulbs
Jamaica	Ugli fruit, cut flowers, papaya & 46 other commodities
Japan	Sand pears, Unshu oranges, Fuji apples
Korea	Sand pears, mandarin oranges
Mexico	Mangoes, citrus (fumigation or from Sonora free zone), apples, apricots, peaches, persimmons, & pomegranates (Sonora free zone)
New Zealand	Apples, pears, Nashi pears
The Netherlands	Flower bulbs
Nicaragua	Mangoes
Peru	Mangoes
Scotland	Flower bulbs
South Africa	Apples, pears, plums, grapes, peaches, nectarines, & citrus
Spain	Lemons, clementines, Valencia oranges
Turkey	Flower bulbs
Venezuela	Mangoes

Screwworms were eradicated from the United States through the use of the sterile insect technique. With this method, millions of screwworm flies are reared in captivity, sterilized, and then released over infested areas to mate with native fertile flies. Eggs produced through such matings do not hatch, and the insect literally breeds itself out of existence.

To provide further protection to U.S. livestock, starting in 1972, eradication efforts were moved southward from the U.S.-Mexico border, with the eventual goal of establishing a barrier of sterile flies across the Isthmus of Panama. To date, screwworms have been eradicated from Mexico, Guatemala, Belize, Honduras, El Salvador, and Nicaragua. Eradication is well advanced in Costa Rica and as of June 1999, no new cases had been reported since March 18, 1999. Eradication in Panama began in 1998, and a new rearing facility is planned. Currently, the production plant at Tuxtla Gutierrez, Chiapas in Mexico is producing 143 million sterile flies weekly. The plant has the capacity to produce 500 million sterile flies weekly.

IS also works to prevent foot-and-mouth disease (FMD) from entering Mexico, Central America, and Panama and works with Colombia to eliminate FMD from the northern part of that country.

Coping with Invasions

If, despite our best efforts, foreign pests or diseases do manage to slip past our border defenses, APHIS conducts appropriate control and eradication measures. Examples include Mediterranean fruit fly eradication projects in California in the early 1990's and outbreaks of exotic Newcastle disease in pet birds in several States during the 1980's.

APHIS PPQ has a special cadre of people who deal with introductions of exotic plant pests. Known as "Rapid Response Teams," these groups have been mobilized on several occasions to combat costly infestations of Medflies and to perform other tasks.

Early detection of exotic animal diseases by alert livestock producers and practicing veterinarians who contact specially trained State and Federal veterinarians is the key to their quick detection and elimination. More than 300 such trained veterinarians are located throughout the United States to investigate suspected foreign diseases. Within 24 hours of diagnosis, one of two specially trained task forces in APHIS' Veterinary Services (VS) can be mobilized at the site of an outbreak to implement the measures necessary to eradicate the disease.

Currently, APHIS officials are actively working to prevent the entry of bovine spongiform encephalopathy (BSE)—sometimes referred to as "mad cow disease." This disease has had a serious impact on the British livestock industry. BSE has never been diagnosed in the United States. Since 1989, APHIS has restricted the importation of live ruminants and ruminant products—including animal feed made with ruminant protein—from Great Britain and other countries where BSE is known to exist. In addition, APHIS has conducted a BSE surveillance program since 1989. Specialists have examined brain specimens from more than 7,052 cattle and have found no evidence of BSE.

Import-Export Regulations

APHIS is responsible for enforcing regulations governing the import and export of plants and animals and certain agricultural products.

Import requirements depend on both the product and the country of origin. Plants and plant materials usually must be accompanied by a phytosanitary certificate issued by an official of the exporting country. Livestock and poultry must be accompanied by a health certificate, also issued by an official of the exporting country. Animal products, such as meats and hides, are usually restricted if they originate in countries that have a disease that is not present in the United States.

APHIS regulates the importation of animals that enter the country through land ports along the borders with Mexico and Canada. Imports of livestock and poultry from most countries must be quarantined at one of three animal import centers: Newburgh, NY; Miami, FL; and Los Angeles, CA.

Personally owned pet birds can enter through one of five USDA-operated bird quarantine facilities: New York, NY; Miami, FL.; San Ysidro, CA.; Hidalgo, TX; and Los Angeles, CA. Those that qualify as U.S.-origin birds may return through any port of entry when arrangements have been made for a USDA-VS veterinarian to inspect their bird.

Pet birds from Canada can enter without quarantine because Canada's animal disease programs and import rules are similar to those of the United States. Commercial shipments of pet birds can enter through one of the privately owned, APHIS-supervised quarantine facilities. APHIS cooperates with the U.S. Department of Interior in carrying out provisions of the Endangered Species Act that deal with imports and exports of endangered plant, animal, or bird species. APHIS inspectors at ports of entry are trained to identify these species and notify Interior of any Convention on International Trade in Endangered Species (CITES)-protected species found during inspection. Also, at many ports, APHIS officers inspect and sample seed imported from foreign countries to ensure that it is accurately labeled and free of noxious weeds.

APHIS also maintains 16 plant inspection stations, the largest of which is at Miami, FL, for commercial importation of plant materials. Smaller stations are at Orlando, FL; San Juan, PR; JFK International Airport, Jamaica, NY; Elizabeth, NJ; Houston, El Paso, and Los Indios (Brownsville), TX; Nogales, AZ.; San Diego, Los Angeles, and San Francisco, CA; Seattle, WA; Honolulu, HI; Beltsville, MD; and New Orleans, LA.

To facilitate agricultural exports, APHIS officials certify the health of both plants and animals that are shipped to foreign countries. APHIS PPQ provides assurance that U.S. plants and plant products meet the plant quarantine import requirements of foreign countries. This assurance is in the form of a phytosanitary certificate, issued by PPQ or its State cooperators. During fiscal year (FY) 1997, 298,365 phytosanitary certificates were issued for exports of plants and plant products worth more than $20 billion.

VS officials and the National Center for Import and Export negotiates animal health requirements for export of livestock, germplasm, poultry and animal products with the importing countries. These requirements are maintained in the International Regulations Retrieval System (IRRS). VS area offices and major exporters have access to the system. IRRS is also available on the World Wide Web.

USDA accredited veterinarians issue health certificates in order to meet the U.S. requirements and the requirements of the recipient country. These health certificates are endorsed by VS area veterinarians in the State of origin. The final inspection of livestock is conducted by a VS port veterinarian at the port of embarkment. This inspection is not required for livestock shipped to Canada and Mexico if they are shipped through land border ports.

It is in the area of foreign health requirements that APHIS is of greatest help to the U.S. livestock industry. Through direct negotiations with foreign governments, APHIS has established approximately 450 livestock, semen, embryo and poultry health agreements with more than 100 countries in the world. These negotiations are a continuous process, wherever APHIS finds opportunities to open new markets, and to reduce unnecessary impediments or whenever changing disease conditions require adjustments. In 1996, APHIS averted a ban of U.S. poultry meat to Russia and China worth more than $2 billion.

In addition to certifying to the health of agricultural exports, APHIS officials mount a proactive approach to the marketing of U.S. crops and livestock overseas.

For instance, APHIS and Food Safety and Inspection Service officials coordinated negotiations to avert a Russian embargo on U.S. poultry exports worth $600 million a year. On the plant side, efforts by APHIS and Foreign Agricultural Service officials helped maintain U.S. wheat exports after the March 1996 discovery of an outbreak of Karnal bunt, a fungal disease of wheat, in Arizona. The United States is the world's leading wheat exporter, accounting for 25 percent of world wheat exports in 1997. U.S. wheat exports in calendar 1997 were valued at $3.4 billion.

Domestic Plant Health Programs

In most cases, plant pest problems are handled by individual 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, APHIS may join in the control work.

Most pests and weeds that are targets of APHIS' Plant Protection and Quarantine (PPQ) programs are not native to America. They gained entry into this country through commercial trade channels, international travelers, or other means.

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, foreign pests are only minor problems in their native lands because they are kept in check by native parasites, predators, and diseases. Since many of these natural enemies may not exist in the United States, one of PPQ's control techniques—in cooperation with USDA's Agricultural Research Service—is the importation, rearing, and release of parasites and other biological control organisms.

Biocontrol—Nature's Way

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. Pathogens include bacteria, viruses, or fungi that cause diseases specifically injurious to a target pest.

Biological control was first put to broad, practical use in the United States in the 1880's. At that time, California citrus groves were being devastated by an exotic insect, the cottony-cushion scale. A USDA scout working in Australia found the vedalia beetle feeding on the scale insect. The beetle, part of the lady beetle family, was successfully introduced into California and other citrus-growing regions and has kept the scale insect from causing economic damage ever since.

To coordinate the important search for new and better biocontrol opportunities, a National Biological Control Institute was established in APHIS in 1989. The Institute's mission is to promote, facilitate, and provide leadership for biological control. Its main work is to compile and release technical information and coordinate the work needed to find, identify, and augment or distribute new biological control agents.

The Institute relies on scientists from USDA's Agricultural Research Service and elsewhere to identify potentially useful biological control agents. These agents are carefully screened at quarantine centers before being put to use.

Various agencies have successfully cooperated on biocontrol projects. For example, several decades ago, ARS scientists found six species of stingless wasps in Europe that keep alfalfa weevils in check. In 1980, APHIS took on the job of establishing these beneficial wasps across the land. Between 1980 and 1989, APHIS and its cooperators raised and distributed about 17 million wasps, and today there are beneficial wasps within reach of virtually every alfalfa field in the country. It's estimated that the benefits of the alfalfa weevil biocontrol program amount to about $88 million per year, representing a return of about $87 for each $1 spent on the project.

Other APHIS biocontrol programs currently underway in cooperation with State agencies include efforts against the cereal leaf beetle, sweet potato whitefly, Colorado potato beetle, brown citrus aphid, pink hibiscus mealybug, gypsy moth, imported fire ant, leafy spurge, purple loosestrife, Russian knapweed, dalmatian and yellow toadflax, diffuse and spotted knapweed. Promising biocontrol agents for other pests are being tested at PPQ biocontrol labs located at Mission, TX; Niles, MI; and Bozeman, MT.

"Deliver Us From Weevil"—Boll Weevil Eradication

One major domestic program PPQ is coordinating is the effort to eradicate boll weevils from the United States. The boll weevil entered this country from Mexico in the late 1890's and soon became a major pest of cotton. It has caused an estimated $12 billion in losses to the Nation's economy. In 1973, it was estimated that insecticides applied to control boll weevils accounted for about one-third of the total applied to agricultural crops in the United States.

The success of a 1971-73 cooperative boll weevil eradication experiment in portions of Mississippi, Louisiana, and Alabama involving Federal and State agencies and grower associations led to two 3-year demonstration projects. One was an eradication trial in North Carolina and Virginia; the second was an optimum pest management trial in Mississippi. The eradication trial was a success in 1980, and the program has undergone regular, incremental expansion since that time.

The current boll weevil eradication effort judiciously applies pesticides based on the number of adult weevils trapped around cotton fields. The traps contain a pheromone (insect attractant) and a small amount of insecticide that kills all captured weevils. In eradication program areas, one to three traps are placed per acre and are checked weekly. Pesticide is applied only to fields that reach a predetermined number of trapped weevils. This selective use of pesticides results in fields requiring minimal pesticide applications—sometimes none—during the growing season. After several seasons, the weevils are eradicated within the defined program area, eliminating any further need to spray for this pest. As an indirect benefit of eliminating the boll weevil, growers are able to maintain beneficial insects that help control many secondary pests. This further reduces the amount of pesticide used each season to produce the cotton crop.

The table below shows the progress in eradicating boll weevils from U.S. cotton-growing areas.

	States involved	*Eradication Acres*	*Weevil-free Acres*
1983	VA/NC/SC	160,000	35,000
1985	+CA/AZ	1,400,000	1,100,000
1987	+GA/FL/AL	450,000	1,500,000
1994	+MS/TN/TX	50,000	2,000,000
1996	Same	1,300,000	4,600,000
1997	+LA	1,600,000	4,600,000
1998	+OK	2,000,000	*4,600,000

*significant acreage should move into "weevil-free" phase in 1999

In the cooperative boll weevil eradication program, APHIS provides technical support, a portion of program funds, and some capital equipment and administrative support. Grower assessments and/or State appropriations provided 87 percent of the total program cost in 1998, with APHIS providing the remaining 13 percent.

The economic benefit to cost ratio for the program has been projected to be 12 to1 nationwide, and as high as 40 to1 in specific areas of the Cotton Belt. The success of the program has brought a resurgence of cotton production and related industries. Acreage in the Southeast has increased nearly fourfold since the weevil's eradication. Cotton growers in eradicated areas are better able to withstand difficult economic times, such as the low market prices of 1998, because their production costs—without the weevil—are much lower than those in the infested areas.

Witchweed–A Success Story

Witchweed is a parasitic plant that attaches itself to the roots of crops such as corn, sorghum, sugar cane, and other members of the grass family, robbing them of water and vital nutrients. Each plant can produce up to 500,000 seeds per year, and the seeds can remain viable in the soil for up to 15 years, germinating when they come into contact with the root of a host plant.

Witchweed was introduced into the Carolinas from Africa in the mid-1950's. When the parasite first struck, corn plants mysteriously withered and died. A student visiting from India recognized the weed and told U.S. agricultural experts what it was.

Over the course of an eradication effort that began in 1974, some 450,000 acres have been infested. The eradication program was based on surveillance to locate infested fields, quarantines to prevent spread, and a combination of herbicides and germination stimulants to actually eradicate the weed.

At the beginning of FY 1995, with fewer than 28,000 infested acres remaining, APHIS turned operation of the program over to North Carolina to complete eradication there, but continues to help finish the eradication effort in South Carolina. By the fall of 1997, the infested area was expected to be reduced to 9,000 acres in North Carolina and 1,500 acres in South Carolina.

Grasshoppers and IPM

APHIS was the lead agency in a cooperative Integrated Pest Management (IPM) initiative for grasshopper control in the Western United States. This IPM project, which began in 1987 and closed down in 1994, was aimed at finding better and more acceptable ways of preventing grasshopper damage, while protecting the environment. Activities included developing means to predict and manage grasshopper outbreaks, developing biological control alternatives that minimize the use of chemicals, and integrating proven control techniques into guidelines for APHIS rangeland grasshopper programs.

All this information was integrated into a computer-based decision support system program called "HOPPER." HOPPER is a user-friendly software package that facilitates grasshopper predictions, time and selection of control options, compilation of weather data, and analysis of the economics of range management practices. An example of how HOPPER is used was provided by a Logan County, CO, official in August 1996. He wrote: "I was recently asked to utilize the district's resources to help ranchers save grass pasture obviously threatened by grasshoppers." Using the HOPPER computer model (previously downloaded from the Internet), he estimated the return and decided on the best treatment method.

"We discovered that we would spend $4 per acre in an effort to save $1.50 per acre of grass. The ranchers quickly realized they could purchase hay to replace lost forage and save money. The program showed us we would also have very little effect on next year's population. It also showed us that we should initiate any control effort sooner in the year than we have done in the past."

Other domestic PPQ programs include a quarantine program to prevent the artificial spread of the European gypsy moth from infested areas in the Northeastern United States through movement of outdoor household goods and other articles; quarantines to prevent the spread of imported fire ants through movement of plant nursery material from infested areas; and releasing irradiated sterile pink bollworm moths to keep this insect out of cotton in California's San Joaquin Valley.

Domestic Animal Health Programs

Protecting the health of the Nation's livestock and poultry industries is the responsibility of APHIS' Veterinary Services (VS).

VS veterinary medical officers and animal health technicians work with their counterparts in the States and with livestock producers to carry out cooperative programs to control and eradicate certain animal diseases. The decision to begin a nationwide campaign against a domestic animal disease is based on a number of factors, the most important of which is: "Are producers and the livestock industry a leading force in the campaign?"

This organized effort against livestock diseases began in 1884 when Congress created a special agency within USDA to combat bovine pleuropneumonia–a dreaded cattle disease that was crippling exports as well as taking a heavy toll on domestic cattle. Within 8 years, contagious bovine pleuropneumonia had been eradicated and this campaign set the pattern for subsequent animal disease control and eradication programs.

To date, 13 serious livestock and poultry diseases have been eradicated from the United States. They are:

Year	*Disease*
1892	Contagious bovine pleuropneumonia
1929	Foot-and-mouth disease
1929	Fowl plague
1934	Glanders
1942	Dourine
1943	Texas cattle fever
1959	Vesicular exanthema (VE)
1959 & 66	Screwworms (southeast & southwest)
1971	Venezuelan equine encephalitis
1973	Sheep scabies
1974	Exotic Newcastle disease
1978	Classical swine fever
1985	Lethal avian influenza

Current VS disease eradication programs include cooperative State-Federal efforts directed at cattle and swine brucellosis, bovine tuberculosis, and pseudorabies in swine. The following table shows the status of States in these programs.

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 to prevent further disease spread, treatment to eliminate parasites, vaccination in some cases, and cleaning and disinfection of contaminated premises. In addition to the programs listed above, APHIS also cooperates with States in a voluntary Flock Certification program to combat scrapie in sheep and goats. By April 1998, 260 sheep and goat flocks had been enrolled in the certification program. A current listing of enrolled flock, by State and by breed, is available on the World Wide Web (*http://www.aphis.usda.gov/vs/scrapie/status.html*).

APHIS animal health programs are carried out by a field force of about 250 veterinarians and 360 lay inspectors working out of area offices (usually located in State capitals). Laboratory support for these programs is supplied by APHIS' National Veterinary Services Laboratories (NVSL) at Ames, IA, and Plum Island, NY, which are centers of excellence in the diagnostic sciences and an integral part of APHIS' animal health programs.

Under the Virus-Serum-Toxin Act of 1913, APHIS enforces regulations to assure that animal vaccines and other veterinary biologics are safe, pure, potent, and effective. Veterinary biologics are products designed to diagnose, prevent, or treat animal diseases. They are used to protect or diagnose disease in a variety of domestic animals, including farm animals, household pets, poultry, fish, and fur bearers.

Veterinarians and other professionals in the APHIS VS Center for Veterinary Biologics regulate and license veterinary biologics as well as the facilities where they are produced. They also inspect and monitor the production of veterinary biologics,

State	*Cattle* Brucellosis*	*Swine* Brucellosis**	*Cattle* TB***	*Swine* Pseudorabies****
AL	FREE	STAGE 2	FREE	FREE
AK	FREE	FREE	FREE	FREE
AZ	FREE	FREE	FREE	FREE
AR	FREE	STAGE 2	FREE	STAGE 3/4
CA	FREE	FREE	M-A	STAGE 3
CO	FREE	FREE	FREE	FREE
CT	FREE	FREE	FREE	FREE
DE	FREE	FREE	FREE	FREE
FL	FREE	STAGE 2	FREE	STAGE 3
GA	FREE	FREE	FREE	STAGE 4
HI	FREE	FREE	SUSP.M-A	STAGE 4
ID	FREE	FREE	FREE	FREE
IL	FREE	FREE	FREE	STAGE 3
IN	FREE	FREE	FREE	STAGE 2/3
IA	FREE	FREE	FREE	STAGE 2/3
KS	CLASS A	FREE	FREE	STAGE 3
KY	FREE	FREE	FREE	FREE
LA	FREE	STAGE 2	FREE	STAGE 3
ME	FREE	FREE	FREE	FREE
MD	FREE	FREE	FREE	FREE
MA	FREE	FREE	FREE	STAGE 4
MI	FREE	FREE	FREE	STAGE 3
MN	FREE	FREE	FREE	STAGE 2/3
MS	CLASS A	FREE	FREE	FREE
MO	CLASS A	FREE	FREE	STAGE 4
MT	FREE	FREE	FREE	FREE
NE	FREE	FREE	FREE	STAGE 3
NV	FREE	FREE	FREE	FREE
NH	FREE	FREE	FREE	FREE
NJ	FREE	FREE	FREE	STAGE 3
NM	FREE	FREE	M-A	FREE
NY	FREE	FREE	FREE	FREE
NC	FREE	FREE	FREE	STAGE 2/3
ND	FREE	FREE	FREE	FREE
OH	FREE	FREE	FREE	STAGE 3
OK	CLASS A	STAGE 2	FREE	STAGE 4
OR	FREE	FREE	FREE	FREE
PA	FREE	FREE	M-A	STAGE 3
PR	FREE	FREE	M-A	FREE
RI	FREE	FREE	FREE	FREE
SC	FREE	STAGE 2	FREE	FREE
SD	CLASS A	FREE	FREE	STAGE 3/4
TN	FREE	FREE	FREE	FREE
TX	CLASS A	STAGE 2	M-A	STAGE 3

UT	FREE	FREE	FREE	FREE
VT	FREE	FREE	FREE	FREE
VI	FREE	FREE	FREE	FREE
VA	FREE	FREE	FREE	FREE
WA	FREE	FREE	FREE	FREE
WV	FREE	FREE	FREE	FREE
WI	FREE	FREE	FREE	STAGE 3/4
WY	FREE	FREE	FREE	FREE

* Class A (less than 0.25 percent herd infection rate) or Class Free
** Stage 1,2, or Free
*** Modified Accredited (M-A) or Accredited Free (Free)
**** Stage 1,2,3,4, or Free

including both genetically engineered products and products produced by conventional means.

Since the first genetically engineered vaccine was licensed in 1979, a total of 79 such biologics have been licensed; all but 20 are still being produced. More than a half century ago, there were perhaps half a dozen animal vaccines and other biologics available to farmers. Now there are 2,379 active product licenses and 110 licensed manufacturers.

Monitoring Plant and Animal Pests and Diseases

In order to combat plant pests and animal diseases, it's important to know their number and where they are located.

To monitor plant pests, APHIS PPQ works with the States in a project called the Cooperative Agricultural Pest Survey, which started in 1982 as a pilot project. Survey data on weeds, insects, and plant diseases and pests is entered into a nationwide database, the National Agricultural Pest Information System (NAPIS). This database can be accessed from anywhere in the country by persons with an authorized account.

By accessing NAPIS, users can retrieve the latest data on pests. NAPIS data can assist pest forecasting, early pest warning, quicker and more precise delimiting efforts, and better planning for plant pest eradication or control efforts. Survey data—which can reflect the absence as well as the presence of pests—also helps U.S. exports, assuring foreign countries that our commodities are free of specific pests and diseases.

There are more than a million records in the NAPIS database. Approximately 200 Federal and State agencies use NAPIS. NAPIS contains survey data files as well as text and graphics files. The data can be downloaded and analyzed with geographic information systems (GIS) to provide graphic representation of information. For example, locations of pine shoot beetle detections can be shown graphically as well as where and how often surveys have been conducted for the beetle. This information is used by the State and Federal agencies regulating this pest.

Describing animal health and management in the United States is the goal of the APHIS National Animal Health Monitoring System (NAHMS). This program, which is conducted by APHIS VS, began in 1983.

NAHMS compiles statistics and information from existing data bases and gathers new data through short- and long-term targeted studies to present a baseline picture of animal agriculture. This information then can be used to predict trends and improve animal production efficiency, and food quality. NAHMS provides statistically sound data concerning U.S. livestock and poultry diseases and disease conditions, along with their costs and associated production practices. By the end of 1997, NAHMS had conducted nine national studies on U.S. animal populations: swine (2), dairy (2), beef cow/calf (2) , beef feedlot (1), sheep (1), and catfish (1). Sentinel monitoring of morbidity and mortality in beef feedlots is an ongoing monitoring project, as is bulk tank somatic cell count. Marek's disease in broiler operations, and poultry enteritis and mortality syndrome (PEMS) in turkeys were among NAHMS' short-term projects.

Information from NAHMS aids a broad group of users throughout agriculture. For instance, baseline animal health and management data from NAHMS national studies are helping analysts identify associations between *Salmonella* and cattle management. NAHMS data are also helping researchers evaluate management practices that contribute to the occurrence of Johne's disease and digital dermatitis in cattle. State and national officials, industry groups, and producers apply NAHMS data and information in educational programs and in setting research priorities.

NAHMS information is available through the World Wide Web (*http://www.aphis.usda.gov/vs/ceah*); see the Center for Animal Health Monitoring.

Regulating Biotechnology in Agriculture

Scientists use agricultural biotechnology with a variety of laboratory techniques, such as genetic engineering, to improve plants, animals, and microorganisms. Recent discoveries have led to virus-resistant crops such as cucumbers, tomatoes, and potatoes; to better vaccines and diagnostic kits used for diseases of horses, chickens, and swine; and even to new and improved varieties of commercial flowers.

Since 1987, APHIS' role in agricultural biotechnology has been to manage and oversee regulations to ensure the safe and rapid development of the products of biotechnology. Applicants under APHIS' effective regulations and practical guidelines can safely test—outside of the physical containment of the laboratory—genetically engineered organisms.

APHIS officials issue permits or acknowledge notification for the importation, interstate movement, or field testing of genetically engineered plants, microorganisms, and invertebrates that are developed from components from plant pathogenic material.

Since 1987, APHIS has issued more than 3,800 release permits and notifications at more than 17,000 sites in the United States and no environmental problems have resulted from these field tests. The biotechnology regulations also provide for an exemption process once it has been established that a genetically engineered product does not present a plant pest risk. Under this process, applicants can petition APHIS for a determination of nonregulated status for specific genetically engineered products. Over 2-1/2 years, 20 new engineered plant lines in 11 crops were proven safe and no longer need to be regulated by APHIS. One was the first genetically engineered sugar beet, which is herbicide tolerant.

The four recent deregulated include:

- tomato line with insect resistance,
- rapeseed (canola) line with herbicide tolerance,
- corn line with herbicide tolerance, and
- chicory (salad green) line with male sterility.

APHIS biotechnology personnel meet with regulatory officials from other nations on a regular basis to foster regulatory harmonization. These discussions are intended to help ensure that requirements imposed by other countries are as consistent as possible with U.S. requirements and that our trading partners are kept informed of biotechnology regulatory developments.

Controlling Wildlife Damage

The mission of APHIS' Wildlife Services (WS) program is to provide Federal leadership in managing problems caused by wildlife. Wildlife is a significant public resource that is greatly valued by the American public. But by its very nature, wildlife also can damage agricultural and industrial resources, pose risks to human health and safety, and affect other natural resources. WS helps solve problems that occur when human activity and wildlife are in conflict with one another. In doing so, WS attempts to develop and use wildlife management strategies that are biologically, environmentally, and socially sound.

The need for effective and environmentally sound wildlife damage management is rising dramatically. There are several reasons for this. Increasing suburban development intrudes upon traditional wildlife habitats. Population explosions of some adaptable wildlife species, such as coyotes, deer, and geese, pose increasing risks to human activities. At the same time, advances in science and technology are providing alternative methods for solving wildlife problems.

APHIS' National Wildlife Research Center (NWRC), the world's only research facility devoted entirely to the development of methods for managing wildlife damage, accounts for about one-fourth of WS' budget. In existence since the 1940's, NWRC has an integrated, multi-disciplinary research program that is uniquely suited to provide scientific information and solutions to wildlife damage problems.

A few examples of current NWRC projects include:

- developing chemosensory repellants and attractants for birds and mammals,
- finding methods to reduce threats to human safety when birds collide with airplanes,
- finding ways to control the brown tree snake in Guam,
- engineering an immunocontraceptive vaccine and delivery system to help resolve problems caused by wildlife overpopulation,
- reducing damage by birds to commercial fish production and cereal crops,
- studying coyote biology and behavior to develop techniques for protecting livestock from these predators,
- looking at ways to solve wildlife problems in urban areas involving such things as deer in backyards, squirrels damage to telephone lines, and geese on golf courses,
- reducing beaver damage to agricultural resources,
- developing methods to reduce wildlife damage to forest resources, and
- finding effective methods for reducing rodent damage to agricultural crops.

More than half of U.S. farmers experience economic loss from animal damage. In 1994, sheep and goat producers lost an estimated $17.7 million due to predation. In 1995, cattle producers' losses to predators were worth $39.6 million. During this year, coyotes alone caused $11.5 million in sheep losses and $21.8 million in cattle losses nationwide. A survey in 1993 showed that wildlife caused $92 million in losses to corn producers in the top 10 corn-producing States.

Additionally, beavers in the Southeastern United States cause an estimated $100 million in damage each year to public and private property, while Mississippi catfish farmers lose nearly $6 million worth of fingerlings to fish-eating birds. During 1 year in Pennsylvania, white-tailed deer caused crop losses totaling $30 million. Overall, bird populations cause an estimated annual loss to U.S. agriculture of $100 million. In 1994, the annual dollar loss to agriculture in the United States from wildlife was between $600 million and $1.6 billion.

The National Agricultural Statistics Service surveyed 1,465 catfish producers in January of 1997. Results indicated that 68 percent of the respondents spent some effort to avoid wildlife-related losses to their catfish crops. Of all losses reported, 67 percent of the catfish were depredated by wildlife, primarily birds. In Mississippi, where 81 percent of wildlife damage was reported, cormorants were cited as the cause 53 percent of the time. Total cost of wildlife-related damage prevention of further damage was projected to have cost catfish producers $17 million in 1996.

APHIS deals with a wide variety of wildlife problems, ranging from coyote predation on lambs to protecting endangered species from predation by other wildlife. Here are a few examples of WS efforts:

- A farmer in the State of Washington requested WS assistance after thousands of Canada geese congregated on his 43-acre field of carrots and began eating his crop, which had a potential market value of more than $7,000 an acre. Noise-making devices and other scare tactics recommended by WS were successful in frightening the geese and keeping them out of his field.
- WS is conducting a program to reduce the impact of Canada geese on agricultural crops in southwestern Washington State. WS provides services to farmers using a variety of nonlethal methods to haze geese grazing on pastures and crops. These services are part of a cooperative effort involving the U.S. Fish and Wildlife Service (FWS), the Washington Department of Fish and Wildlife, and WS. The program has proven to be both effective and popular with farmers in the service area. During February, producers petitioned FWS, who is funding the program, to extend the period of service provided by WS. This resulted in FWS providing an additional $200,000 to WS for field operations. These funds enabled WS to extend control activities into early May, when Canada goose damage to pastures and crops typically starts to decrease.
- A mountain lion that killed a dog and attacked another dog and a mule in Colorado was captured by a WS specialist and officials from the Colorado Division of Wildlife. The lion was released unharmed in a remote site about 165 miles from the community where the attacks occurred.

- On March 18, 1999, red-tailed hawks struck a 737 commercial airliner during a landing at the Eppley Air Field in Omaha, NE, causing an estimated $300,000 worth of damage. WS is providing various types of technical advice and direct control assistance to reduce hazards at the airport. In a cooperative effort with airport officials, FWS, and WS—including NWRC—initiated a trapping program to capture red-tailed hawks and American kestrels and relocate them approximately 150 miles from the airport.
- WS' NWRC has entered into a new 5-year interagency agreement with the Federal Aviation Administration (FAA) to conduct research on understanding and reducing bird hazards to aircraft. This new agreement, covering 1999-2003, replaces an agreement that had been in place from 1991 to 1998. Research tasks to be conducted by NWRC for FAA under the new arrangement include: habitat management on and near airports to reduce bird activity, development and evaluation of bird repellent and frightening methods for airports, management and analysis of the National Wildlife Strike Database, and development of an FAA wildlife control manual for use by airport operators nationwide. The research will be coordinated out of NWRC's Ohio field station. Bird and other wildlife collisions with aircraft occasionally result in the loss of life and cost U.S. aviation over $300 million per year.
- Livestock guarding dogs, predator-proof fencing, and the "Electronic Guard" (a device developed by WS that combines a flashing strobe light and a siren to scare coyotes) are examples of nonlethal ways to minimize damage from predators.
- WS helps protect many threatened or endangered species from predation, including the California least tern and light-footed clapper rail, the San Clemente Island loggerhead strike, Louisiana black bear, the Aleutian Canada goose, the black-footed ferret, the Louisiana pearl shell (mussel), and two species of endangered sea turtles.
- Since 1995, WS has cooperated with Texas officials in a multi-year program to help combat rabies epidemics in southern and central parts of the State. WS cooperated in the development of coyote bait units containing a genetically engineered rabies vaccine approved by APHIS for use in the project. Cumulatively, since 1995, more than 11 million bait units have been dropped over an area of 171,000 square miles in Texas. The goal of the project is to create a buffer zone of immunized coyotes to help prevent the further spread of canine rabies across Texas into more heavily populated areas. January 1999 marked the fifth year that WS has participated in the project to prevent the spread of canine rabies in both coyotes and foxes. The 1999 operation of the project was concluded in 26 days and involved the distribution of approximately 2.7 million bait units of an area of nearly 34,000 square miles in south and central Texas. The project has led to a marked decrease in the incidence of rabies in wild canids.

Humane Care of Animals

APHIS administers two laws that seek to ensure the humane handling of animals: the Animal Welfare Act (AWA) and the Horse Protection Act (HPA).

For more than a quarter century, USDA has enforced the AWA and its standards and regulations to prevent the trafficking in lost and stolen pets and protect animals from inhumane treatment and neglect. Congress passed the AWA in 1966 and strengthened the law through amendments in 1970, 1976, 1985, and 1990.

The AWA prohibits staged dogfights, bear and raccoon baiting, and similar animal fighting ventures. It also requires that minimum standards of care and treatment be provided for most warmblooded animals bred for commercial sale, used in research, transported commercially, or exhibited to the public. This includes animals exhibited in zoos, circuses, and marine mammal facilities as well as pets transported on commercial airlines.

Individuals who operate regulated businesses must be licensed or registered with USDA and provide their animals with adequate care and treatment in the areas of housing, handling, sanitation, nutrition, water, veterinary care, and protection from extremes of weather and temperature. They must also keep accurate acquisition and disposition records and a description of every animal that comes into their possession. In addition:

- Dealers must hold the animals they acquire for a period of 5 to 10 days to verify the animals' origin and allow pet owners an opportunity to locate a missing pet.
- Research facilities must provide dogs with the opportunity for exercise; promote the psychological well-being of primates used in laboratories; and give all regulated animals anesthesia or pain-relieving medication to minimize any pain or distress caused by research if the experiment allows.
- Research facilities must establish an institutional animal care and use committee to oversee the use of animals in experiments. This committee reviews research protocols and facilities to ensure they are in compliance with the AWA. It also ensures that researchers explore alternatives to painful experiments and ways to reduce the numbers of animals used. The committee must be composed of at least three members, including one veterinarian and one person who is not affiliated with the facility in any way.

In enforcing the AWA, APHIS conducts prelicensing inspections of licensees. Before issuing a license, applicants must be in compliance with all standards and regulations under the AWA.

APHIS also conducts randomly scheduled unannounced inspections to ensure that all regulated facilities continue to comply with the Act. If an inspection reveals deficiencies in meeting the AWA standards and regulations, the inspector instructs the licensee or registrant to correct the problems within a given timeframe. If deficiencies remain uncorrected at the followup inspection, APHIS documents the facility's deficiencies and considers possible legal action. Such action could include fines and/or license suspensions or revocations.

In FY 1998, APHIS pursued numerous cases against individuals who were not in compliance with the AWA. The tables below provide data on APHIS' inspection and enforcement efforts for FY 1996-98.

Compliance Inspections, FY 1996–98

FY	*Total facilities (sites)*	*Total compliance inspections*
1998	7,773 (10,393)	10,709
1997	7,789 (10,534)	12,056
1996	7,837 (10,366)	12,635

Sanctions Imposed, FY 1996–98

FY	*Fines Imposed*	*Revocations, suspensions, and disqualifications*
1998	$378,900	34
1997	$868,440	43
1996	$1,052,225	29

USDA also enforces the HPA, which Congress enacted in 1970 (and amended in 1976), to end the practice of "soring" the limbs of Tennessee walking horses and other gaited breeds. The HPA prohibits persons from transporting sore horses to show, sales, and auctions, and from entering and exhibiting sore horses in such events.

Soring practices occur primarily by two means: mechanical and chemical. Regardless of the method, soring is a deliberate attempt to alter the gait of a horse by creating a superficial irritation or lesion that is aggravated by training or performing. Soring practices are primarily confined to the pasterns of the horse's feet.

The management of horse shows, sales, and actions is authorized to employ individuals, called Designated Qualified Persons or DQP's, to examine horses for compliance with the HPA and the horse protection regulations. DQP's are required to disqualify from exhibition any horse that is sore or otherwise not in compliance with the regulations (which, among other things, prohibit the use of certain devices and substances on horses' feet). Even if show management has hired a licensed DQP, it is a violation of the HPA to allow a sore horse to be exhibited if that DQP, or the USDA, has informed management that the horse is sore.

USDA veterinarians also attend shows, sales, and actions in order to ensure that sore horses are not exhibited and to evaluate the performance of the DQP's at these events. USDA veterinarians will also examine horses for compliance with the act, if the DQP did not perform a complete examination or if they suspect that a horse is sore.

The HPA provides for both civil and criminal sanctions for violations. The Secretary is authorized to impose a civil penalty of up to $2,000 for each violation of the HPA, after notice and an opportunity for a hearing, and may disqualify the violator from participating in shows, sales, and auctions for not less than 1 year for the first violation and not less than 5 years for any subsequent violation. Criminal violations are punishable by a fine of up to $3,000 for the first conviction, and up to $5,000 for any subsequent conviction, as well as imprisonment for up to 1 year for a first conviction, and up to 2 years for a subsequent conviction.

Aquaculture

APHIS provides services to the aquaculture industry in a number of areas. Aquaculture is the fastest growing segment of U.S. agriculture, surpassing in value most domestic fruit, vegetable, and nut crops. Between 1980 and 1990, the industry experienced a 400-percent increase in growth; it is now estimated to be worth approximately $1.5 billion. The aquaculture industry provides about 300,000 jobs nationwide.

Current APHIS services include licensing of fish vaccines and other biologics under the Virus-Serum-Toxin Act; controlling birds and damage-causing animals; and providing health certification services for exports. We are currently working to expand our aquatic animal health activities and underlying authority to support industry efforts to increase exports of aquacultural products around the world, for coordinating interstate regulation, and for protection from the entry of animal pests and diseases. Examples include:

- European Union (EU) animal health negotiators have been extremely concerned that U.S. aquatic health regulations are not equivalent to those of the EU, with the main concern centering around the fact that the United States does not have a single Federal agency with legal authority to monitor, prevent, and control outbreaks of aquatic animal disease. Currently, U.S. responsibility in this area is divided among four Federal departments (Agriculture, Interior, Commerce, and Health and Human Services) and the 50 States. APHIS is working with the Joint Subcommittee on Aquaculture's Task Force on Aquatic Animal Health to clarify Federal agency roles, avoid duplication of authority, and achieve adequate protection of U.S. aquatic animals, both wild and cultivated.
- APHIS has produced a video about health certification procedures for the export of aquacultural products. The goal of the video—which uses the example of exporting trout eggs from Washington State to Chile—is to provide animal health and natural resources officials and aquacultural producers with a model of how to implement an aquatic health protocol for exportation of products to a foreign country.
- APHIS' WS program hired three wildlife biologists last July, placing them in Florida, Alabama, and Mississippi to assist aquaculture producers with bird depredation problems. These biologists are helping develop new methods for controlling fish-eating birds, providing onsite assistance to aquaculture producers experiencing depredation problems, and developing management plans for fish-eating bird species in the three States.
- APHIS' VS Centers for Epidemiology and Animal Health (CEAH) completed an overview of the U.S. aquaculture industry, including an analysis of focus on trends in farm size, geographic distribution of aquatic species, and a description of the industry's diversity. During 1997, CEAH worked with USDA's National Agricultural Statistics Service on a comprehensive national study of the U.S. catfish industry.

Recent outbreaks of Taura Syndrome Virus in Texas and Hawaii have caused millions of dollars in losses to shrimp producers in those States. This disease is thought to have been introduced via shrimp products imported from South America.

APHIS officials have not provided any assistance to the producers affected by this outbreak, nor have they assisted in efforts to control and prevent spread of the disease. To rectify this situation, APHIS published an Advance Notice of Proposed Rulemaking seeking comments on treating farm-raised finfish as livestock under the animal quarantine laws. This could lead to a coordinated Federal regulatory program to prevent the introduction and spread of aquatic plants, animals, and organisms that could harm commercial aquaculture production.

Grain Inspection, Packers and Stockyards Administration

The Grain Inspection, Packers and Stockyards Administration (GIPSA) facilitates the marketing of livestock, poultry, meat, grain, oilseeds, and related agricultural products and promotes fair and competitive trading practices for the overall benefit of consumers and American agriculture.

GIPSA, like its sister agencies in USDA's Marketing and Regulatory Programs, is working to ensure a productive and competitive global marketplace for U.S. agricultural products. The agency's Federal Grain Inspection Service (FGIS) provides the U.S. grain market with Federal quality standards and a uniform system for applying them. GIPSA's Packers and Stockyards Programs ensure open and competitive markets for livestock, meat, and poultry.

Federal Grain Inspection Program

Through its Federal Grain Inspection Program, GIPSA facilities the marketing of grain, oilseeds, pulses, rice, and related commodities. This program serves American agriculture by providing descriptions (grades) and testing methodologies for measuring the quality and quantity of grain, rice, edible beans, and related commodities. GIPSA also provides a wide range of inspection and weighing services, on a fee basis, through the official grain inspection and weighing system, a unique partnership of Federal, State, and private laboratories. In FY 1997, the official system performed over 2 million inspections on 226 million metric tons of grain and related commodities.

Specifically, under the U.S. Grain Standards Act, and those provisions of the Agricultural Marketing Act of 1946 (AMA) that relate to inspection of rice, pulses, lentils, and processed grain products, the Federal Grain Inspection Program:

- Establishes official U.S. grading standards and testing procedures for eight grains (barley, corn, oats, rye, sorghum, triticale, wheat, and mixed grain), for oilseeds (canola, flaxseed, soybeans, and sunflower seed), rice, lentils, dry peas, and a variety of edible beans.
- Provides American agriculture and customers of U.S. grain around the world with a national inspection and weighing system that applies the official grading and testing standards and procedures in a uniform, accurate, and impartial manner.

- Inspects and weighs exported grain and oilseeds. Domestic and imported grain and oilseed shipments, and crops with standards under the AMA, are inspected and weighed upon request.
- Monitors grain handling practices to prevent the deceptive use of the grading standards and official inspection and weighing results, and the degradation of grain quality through the introduction of foreign material, dockage, or other nongrain material to grain.

By serving as an impartial third party, and by ensuring that the Official U.S. Standards for Grain are applied properly and that weights are recorded fairly and accurately, GIPSA and the official grain inspection and weighing system advance the orderly and efficient marketing and effective distribution of U.S. grain and other assigned commodities from the Nation's farms to destinations around the world.

Packers and Stockyards Programs

GIPSA's Packers and Stockyards Programs administers the Packers and Stockyards (P&S) Act of 1921. The purpose of the P&S Act, which has been amended to keep pace with changes in the industry, is to assure fair competition and fair trade practice, safeguard farmers and ranchers, and protect consumers and members of the livestock, meat, and poultry industries from unfair business practices that can unduly affect meat and poultry distribution and prices. Enforcement of the P&S Act takes place through the maintenance of administrative disciplinary proceedings within USDA and the filing of actions in court. The P&S Act also provides for members of the industry to file complaints with USDA, seeking reparation.

Payment Protection

The P&S Act requires prompt payment for livestock purchased by dealers, market agencies, and packers whose operations are subject to the Act. Pursuant to this requirement, subject firms must pay for livestock before the close of the next business day following the purchase and transfer of possession. In addition, the Act establishes specific payment deliver requirements for livestock purchased for slaughter. Also, packers, market agencies, and dealers operating in commerce are required to file a surety bond or its equivalent. At the beginning of FY 1998, bonds totaling $631 million were in place to cover the livestock purchases of packers, market agencies, and dealers.

GIPSA also emphasizes custodial account investigations as a means of payment protection for consignors of livestock. All market agencies selling on a commission basis are required to establish and maintain a separate bank account designated as "Custodial Account for Shippers' Proceeds," to be used for deposits from livestock purchasers and disbursements to consignors of livestock. The custodial audit program has been very successful in protecting funds due livestock sellers.

Packer and Poultry Trust Activities

The P&S Act provides that if a meat packer fails to pay for livestock in a cash sale, or a live poultry dealer fails to pay for live poultry grown under a poultry growing arrangement, then receivables, inventories, and proceeds held by the packer or

poultry dealer become trust assets. These assets are held by the meat packer or live poultry dealer for the benefit of all unpaid cash sellers and/or poultry growers. Cash sellers of livestock and poultry growers receive priority payment in bankruptcy or in claims against trust assets in the event of business failure.

Fair Competition

GIPSA works to eliminate unfair, unjustly discriminatory, or deceptive practices in the meat and poultry industries, with special emphasis on investigation of anticompetitive activities. Practices such as apportioning of territories, price manipulation, arrangements not to compete, and payoffs or kickbacks to buyers are violations of the P&S Act. GIPSA staff members immediately investigate any practice that indicates a possible unfair or discriminatory practice.

Scales and Weighing Activities

GIPSA is concerned with two different elements that affect the integrity of weights: (1) the accuracy of scales used for weighing livestock, meat, and poultry, and (2) the proper and honest operation of scales to assure that the weight on which a transaction is based is accurate.

The major emphasis is on detecting improper and fraudulent use of scales. GIPSA's investigative program uses several different procedures to determine whether weighing activity is proper and honest. Agency investigators routinely visit livestock auction markets, buying stations, and packing plants to verify that livestock, carcasses, and live poultry have been accurately weighed and to examine weight records and equipment.

Trade Practices

Fraudulent trade practices—such as price manipulation, weight manipulation of livestock or carcasses, improper use or designation of carcass grades, misrepresentation of livestock as to origin and health, and other unfair and deceptive practices—continue to be concerns within the industry. GIPSA investigates these practices when complaints are received or when such practices are uncovered during other investigations.

Fair Treatment for Poultry Growers

GIPSA enforces the trade practice provisions of the P&S Act relating to live poultry dealers. Its investigative program extensively examines the records of poultry integrators to determine the existence of any unfair, unjustly discriminatory, or deceptive practices in its dealings with poultry growers and sellers. Complaints alleging unfair termination of growing contracts are investigated on a priority basis.

Carcass Merit Purchasing

GIPSA monitors the use of electronic evaluation devices by hog slaughterers who purchase hogs on a carcass merit basis, to ensure that the electronic measuring is accurate and properly applied and that the producer receives an accurate accounting of the sale.

Analysis of Structural Change

GIPSA examines structural changes in the livestock, meat packing, and poultry industries and analyzes the competitive implications of these structural changes. GIPSA uses the analyses as tools in enforcing the P&S Act and in addressing public policy issues relating to the livestock, meat packing, and poultry industries.

Clear Title

The Clear Title provisions of the Food Security Act of 1985 permit States to establish central filing systems to inform parties about liens on farm products. The purpose of this program is to remove an obstruction to interstate commerce in farm products. GIPSA certifies when a State's central filing system complies with the Act.

For More Information

Agricultural Marketing Service

Director, Public Affairs
Billy Cox
Rm 3510-S
Washington, DC 20250
202-720-8998
FAX 202-720-7135ˆ
billy.cox@usda.gov

Public Affairs Specialist
Lena Hogan
Rm 3510-S
Washington, DC 20250
202-720-8998
FAX 202-720-7135
lhogan@usda.gov

Public Affairs Specialist
Demaris Kogut
Rm 3510-S
Washington, DC 20250
202-720-8998
FAX 202-720-7135
demaris.kogut@usda.gov

Public Affairs Specialist
Becky Unkenholz
Rm 3510-S
Washington, DC 20250
202-720-8998
FAX 202-720-7135
becky.unkenholz@usda.gov

Freedom of Info Act Officer
Sharon Kerr
Rm 3510-S
Washington, DC 20250
202-720-2498
FAX 202-690-3767
sharonl.kerr@usda.gov

Animal and Plant Health Inspection Service

Director, Legislative & Public Affairs
Ralph Harding
Rm 1147-S
Washington, DC 20250
202-720-2511
FAX 202-720- 3982
ralph.r.harding@aphis.usda.gov

Deputy Director, Legislative & Public Affairs
Lynn Quarles
Washington, DC 20250
202-720-2511 Rm 1147-S
FAX 202-720-3982
lynn.t.quarles@aphis.usda.gov

Asst. Dir., Public Affairs
Richard McNaney
4B21
Riverdale, MD 20782
301-734-7799
FAX 301-734-5221
rmcnaney@aphis.usda.gov

Asst. Dir., Exec Corresp. & FOIA Office
Michael Marquis
4A81
Riverdale, MD 20782
301-734-5267
FAX 301-734-5941
mmarquis@aphis.usda.gov

APHIS Regional Information Offices
Mountain/Western
Stuart McDonald
Suite 204
12345 W. Alameda Parkway
Lakewood, CO 80228
303-969-6560
FAX 303-969-6973
smcdonald@aphis.usda.gov

West Coast/Southern Border
Larry Hawkins
606 Alamo Pintado, Suite 267
Solvang, CA 73463
805-693-0676
FAX 805-693-0676
lhawkins@aphis.usda.gov

Grain Inspection, Packers and Stockyards Administration

Public Affairs Officer
Dana Stewart
Rm 1094-S
Washington, DC 20250
202-720-5091
FAX 202-205-9237
dstewart@fgis.usda.gov

Freedom of Info Act Officer
Bruce Boor
Rm 3406-S
Washington, DC 20250
202-690-3842
FAX 202-205-3941
bruce_m.boor@usda.gov

Appendix

How To Get Information From USDA's Office of Communications

The Office of Communications (OC) is integral to USDA's historical and current mission. This office coordinates and assists with the flow of public information from USDA program agencies, reviewing all publications and audiovisuals and evaluating new information technology. It offers current information from the Office of the Secretary on programs and policy. This office ensures that adequate and appropriate channels are used to disseminate information to the public, and provides public access to USDA information through the news media.

OC administers USDA's home page on the Internet World Wide Web and the AgNewsFax service. The Internet address for USDA's home page is *http://www.usda.gov*. From this page, you can access information about the Department and also about programs in all mission areas.

OC also offers an automated information line to answer questions from the public. The number for this service is 202-720-2791.

In addition, OC coordinates departmental responses under the Freedom of Information Act, the Privacy Act, and its amendment, the Computer Matching Act.

The following list of key Office of Communications staff is offered for your convenience:

Office of the Director

Director of Communications
Sedelta Verble
Rm 402-A
Washington, DC 20250-1301
202-720-4623
FAX 202-720-5043
sedelta.verble@usda.gov

Press Secretary and Director of Public Affairs
Andy Solomon
Rm 402-A
Washington, DC 20250-1305
202-720-4623
FAX 202-720-5043
andy.solomon@usda.gov

Adm. Asst. to OC Director
Tamika Powell
Rm 412-A
Washington, DC 20250-1330
202-720-4623
FAX 202-690-2164
tamika.powell@usda.gov

Deputy Director
Jody Jaeger
Rm 412-A
Washington, DC 20250-1330
202-720-4623
FAX 202-690-2164
jody.jaeger@usda.gov

Deputy Press Secretary
Susan McAvoy
Rm 405-A
Washington, DC 20250-1305
202-720-4623
FAX 202-720-5403
susan.mcavoy@usda.gov

Deputy Press Secretary
Mary Beth Schultheis
Rm 402-A
Washington, DC 20250-1305
202-720-4623
FAX 202-720-5043
mary_beth.schultheis@usda.gov

Speech Writers:
Bart Acocella
Rm 425-A
Washington, DC 20250-1340
202-720-7819
FAX 202-690-1378
bart.acocella@usda.gov

Cheryl Normile
Rm 423-A
Washington, DC 20250-1340
202-720-4239
FAX 202-690-1378
cheryl.normile@usda.gov

Richard Ades
Rm 422-A
Washington, DC 20250-1340
202-720-9091
FAX 202-690-1378
richard.ades@usda.gov

Communications Coordination and Review Center

Director
Johna Pierce
Rm 440-A
Washington, DC 20250-1350
202-720-5555
FAX 202-690-3611
johna.pierce@usda.gov

Communications Coordinator for Administration, IG, CFO, CIO
Janet Sledge
Rm 446-A
Washington, DC 20250-1350
202-720-2065
FAX 202-690-3611
janet.sledge@usda.gov

Communications Coordinator for Farm and Foreign Agricultural Services
Wayne Baggett
Rm 444-A
Washington, DC 20250-1350
202-720-2032
FAX 202-690-3611
wayne.baggett@usda.gov

Communications Coordinator for Food, Nutrition, and Consumer Services
Jim Borland
Rm 434-A
Washington, DC 20250-1350
202-690-0469
FAX 202-690-3611
jim.borland@usda.gov

Communications Coordinator for Food Safety, and Marketing & Regulatory Programs
Jerry Redding
Rm 432-A
Washington, DC 20250-1350
202-720-6959
FAX 202-690-3611
jerry.redding@usda.gov

Communications Coordinator for Natural Resources and Environment
Martha Cashion Abrams
Rm 442-A
Washington, DC 20250-1350
202-720-3310
FAX 202-690-3611
martha.abrams@usda.gov

Communications Coordinator for Research, Education, and Economics
Maria Bynum
Rm 448-A
Washington, DC 20250-1350
202-720-5192
FAX 202-690-3611
maria.bynum@usda.gov

Communications Coordinator for Rural Development
Jim Brownlee
Rm 436-A
Washington, DC 20250-1350
202-720-2091
FAX 202-690-3611
jim.brownlee@usda.gov

"USDA NEWS" Coord/Editor
Ron Hall
Rm 430-A
Washington, DC 20250-1350
202-720-5747
FAX 202-690-3611
ron.hall@usda.gov

Coord & Rev Asst/HTGI Editor
Shirley E. Adams
Rm 440-A
Washington, DC 20250-1350
202-720-2882
FAX 202-690-3611
shirley.adams@usda.gov

Webmaster
Victor Powell
Rm 528-A
Washington, DC 20250-1350
202-720-7762
FAX 202-690-3611
vic.powell@usda.gov

Electronic Info. Coordinator
Charles Hobbs
Rm 456-A
Washington, DC 20250-1350
202-720-9045
FAX 202-690-3611
charles.hobbs@usda.gov

"AgNews" Editor
Phil Shanholtzer
Rm 457-A
Washington, DC 20250-1350
202-720-8138
FAX 202-720-5575
phil.shanholtzer@usda.gov

Public Affairs Specialist
Marci Hilt
Rm 421-A
Washington, DC 20250-1350
202-720-3088
FAX 202-690-3611
marci.hilt@usda.gov

Public Affairs Specialist
Deborah Smith
Rm 410-A
Washington, DC 20250-1350
202-720-2914
FAX 202-690-3611
debbie.smith@usda.gov

Public Affairs Specialist
Katherine Gibney
Rm 428-A
Washington, DC 20250-1350
202-720-9173
FAX 202-690-3611
katherine.gibney@usda.gov

Publishing & Info. Svs. Coord.
Ed Poe
Rm 426-A
Washington, DC 20250-1350
202-720-9081
FAX 202-720-4948
ed.poe@usda.gov

Senior Pubs. Clearance Editor
Dennis Carroll
Rm 428-A
Washington, DC 20250-1350
202-720-3298
FAX 202-690-3611
dennis.carroll@usda.gov

Publications Clearance Editor
Carrie Pollard
Rm 419-A
Washington, DC 20250-1350
202-720-6046
FAX 202-690-3611
carrie.pollard@usda.gov

Exec. Corres./FOIA Asst.
Sandie Stasiak
Rm 541-A
Washington, DC 20250-1350
202-720-4105
FAX 202-690-3611
sandie.stasiak@usda.gov

Information Response Team
Barbara Robinson
Rm 506-A
Washington, DC 20250-1350
202-690-4069
FAX 202-690-0228
barbara.robinson@usda.gov

Joyce Tyler
Rm 506-A
Washington, DC 20250-1350
202-720-3365
FAX 202-690-0228
joyce.person@usda.gov

General Information Hotline
202-720-2791

Freedom of Info. Act Officer
Andrea Fowler
Rm 532-A
Washington, DC 20250-1350
202-720-8164
FAX 202-720-7808
andrea.fowler@usda.gov

Public Liaison Center

Director
Meg Evans
Rm 412-A
Washington, DC 20250-1330
meg.evans@usda.gov
202-720-4623
FAX 202-690-2164

Public Liaison Coordinator
Kathryn Hill
Rm 415-A
Washington, DC 20250-1330
202-690-4750
FAX 202-690-2164
ocnet.oc-post.kathryn.hill@usda.gov

Public Liaison Analyst
Mocile Trotter
Rm 418-A
Washington, DC 20250-1330
202-720-5505
FAX 202-690-2164
Mocile.trotter@usda.gov

Public Affairs Specialist
Robert Miranda-Acevedo
Rm 417-A
Washington, DC 20250-1330
202-720-0494
FAX202-690-2164
robert.miranda@usda.gov

Admin. Support Specialist
Sandy Odom
Rm 416-A
Washington, DC 20250-1330
202-720-8891
FAX 202-690-2164
sandy.odom@usda.gov

News Distribution
Gayle Turner
Rm 460-A
Washington, DC 20250-1330
202-720-9035
FAX 202-690-2164
gayle.turner@usda.gov

AgNewsFax Service
Use FAX telephone to call
202-690-3944

Internet News Service
news@usda.gov WWW URL
http://www.usda.gov

Video, Teleconference, and Radio Center

Director
Larry A. Quinn
Rm 1618-S
Washington, DC 20250-1360
larry.quinn@usda.gov
202-720-6072
FAX 202-720-5773

Dep Dir/ Broadcasting Coord
Garth Clark
Rm 1614-S
Washington, DC 20250-1360
202-720-5376
FAX 202-720-5773
garth.clark@usda.gov

Senior Television Producer
Patrick O'Leary
Rm 0095-S
Washington, DC 20250-1360
202-720-7039
FAX 202-720-5773
patrick.oleary@usda.gov

Senior Radio Producer
Gary Crawford
Rm 1623-S
Washington, DC 20250-1360
202-720-7068
FAX 202-690-2165
gary.crawford@usda.gov

Senior Radio Producer
Brenda Curtis-Heiken
Rm 1623-S
Washington, DC 20250-1360
202-720-7079
FAX 202-690-2165
brenda.curtis@usda.gov

Radio Reporter
Leslie Parker
Rm 1623-S
Washington, DC 20250-1360
202-720-7884
FAX 202-690-2165
leslie.parker@usda.gov

Video Production Coord
David Black
Rm 1614-S
Washington, DC 20250-1360
202-720-3068
FAX 202-720-5773
david.black@usda.gov

Senior Production Spec
Bob Stobaugh
Rm 0097-S
Washington, DC 20250-1360
202-720-4753
FAX 202-720-5773
bob.stobaugh@usda.gov

Studio Mgr./Tech Dir
Larry Holmes
Rm 1623-S
Washington, DC 20250-1360
202-720-4001
FAX 202-720-5773
larry.holmes@usda.gov

Duplic./Off Air Recording
Evangeline Minor
Rm 1604-S
Washington, DC 20250-1360
202-720-7501
FAX 202-720-5773
evangline.minor@usda.gov

Teleconference Coordinator
David Vennell
Rm 1617-S
Washington, DC 20250-1360
202-720-5368
FAX 202-720-5773
david.vennell@usda.gov

Teleconference Assistant
Mansy Pullen
Rm 1615-S
Washington, DC 20250-1360
202-720-2029
FAX 202-720-5773
mansy.pullen@usda.gov

Teleconference Scheduling
Anita Booth (Audio)
Rm 1611-S
Washington, DC 20250-1360
202-720-6143
FAX 202-690-2042
anita.booth@usda.gov

Liz Conley (Compressed video)
Rm 1611-S
Washington, DC 20250-1360
202-720-8690
FAX 202-720-2042
liz.conley@usda.gov

Training Center Scheduling
Michael Johnson
Rm 1623-S
Washington, DC 20250-1360
202-720-2822
FAX 202-690-2704
ocnet.oc-post.mike.xjohnson@usda.gov

Design Center

Director
Eva Cuevas
Rm 517-A
Washington, DC 20250-1380
202-720-6641
FAX 202-720-8197
eva.cuevas@usda.gov

Deputy Director
David Sutton
Rm 518-A
Washington, DC 20250-1380
202-720-6281
FAX 202-720-8197
david.sutton@usda.gov

Electronic Graphic Design Coordinator
Julie Olson
Rm 524-A
Washington, DC 20250-1380
202-720-4339
FAX 202-720-8197
julie.olson@usda.gov

Exhibit Fabrication Coord.
Larry Sullivan
Rm S-310
Washington, DC 20250-1380
202-720-3393
FAX 202-690-1799
larry.sullivan@usda.gov

Exhibit Shipping Coordinator
Cindy Haydon
Rm 517-A
Washington, DC 20250-1380
202-720-6641
FAX 202-720-8197
cindy.haydon@usda.gov

Photography Center

Director
Bill Tarpenning
Rm 4404-S
Washington, DC 20250-1390
202-720-6633
FAX 202-720-0902
bill.tarpenning@usda.gov

Photojournalists
Ken Hammond
Rm 4415-S
Washington, DC 20250-1390
202-720-8929
FAX 202-720-0902
ken.hammond@usda.gov

Robert Nichols
Rm 4415-S
Washington, DC 20250-1390
202-720-8903
FAX 202-720-0902
bob.nichols@usda.gov

Anson Eaglin
Rm 4409-S
Washington, DC 20250-1390
202-720-0909
FAX 202-720-0902
anson.eaglin@usda.gov

Photo Reproduction/Review
Alice Welch
Rm 4423-S
Washington, DC 20250-1390
202-720-4022
FAX 202-720-0902
alice.welch@usda.gov

Photo Library
Anson Eaglin
Rm 4409-S
Washington, DC 20250-1390
202-720-0909
FAX 202-720-0902
anson.eaglin@usda.gov

Stanley Harrison
Rm 4409-S
Washington, DC 20250-1390
202-720-8905
stan.harrison@usda.gov

Photo Assignments
Vivian Thomas
Rm 4404-S
Washington, DC 20250-1390
202-720-6633
FAX 202-720-0902
vivian.thomas@usda.gov

Printing Management Center

Director
Al Senter
Rm 501-A
Washington, D.C. 20250-1370
202-720-7175
FAX 202-720-8939
al.senter@usda.gov

Forms
Ed McVerry
Rm 501-A
Washington, D.C. 20250-1370
202-720-8137
FAX 202-720-8939
ed.mcverry@usda.gov

Gail Merriman
Rm 501-A
Washington, D.C. 20250-1370
202-720-8146
FAX 202-720-8939
gail.merriman@usda.gov

Publications
Lonnie Thomas
Rm 501-A
Washington, D.C. 20250-1370
202-720-8180
FAX 202-720-8939
lonnie.thomas@usda.gov

Mark Emery
Rm 501-A
Washington, D.C. 20250-1370
202-720-8194
FAX 202-720-8939
mark.emery@usda.gov

Cynthia McNeill
Rm 501-A
Washington, D.C. 20250-1370
202-720-8189
FAX 202-720-8939
cynthia.mcneill@usda.gov

Composite/Rider Orders
Mary Hill
Rm 501-A
Washington, D.C. 20250-1370
202-720-5983
FAX 202-720-8939
mary.hill@usda.gov

Conversion Chart

Metric Conversions

To convert this	*multiply by*	*to this (rounded to hundredths)*
Length		
inches	millimeters (mm)	25.4
feet	centimeters (cm)	30.48
yards	meters (m)	0.91
miles	kilometers (km)	1.61
millimeters	inches	0.04
centimeters	inches	0.39
meters	inches	39.37
meters	yards	1.09
kilometers	miles	0.62
Weight		
ounces	grams(g)	28.35
pounds	kilograms (kg)	0.45
short tons	metric tons	0.91
kilograms	pounds	2.20
metric tons	pounds	2,204.6
metric tons	short tons	1.10
Area		
square inches	square centimeters	6.45
square feet	square meters	0.09
square miles	square kilometers	2.59
acres	hectares	0.40
square centimeters	square inches	0.16
square meters	square yards	1.20
square kilometers	square miles	0.39
hectares	acres	2.47
Volume		
teaspoons	milliliters	4.93
tablespoons	milliliters	14.79
fluid ounces	milliliters	29.58
cups	liters	0.24
pints	liters	0.47
quarts	liters	0.95
gallons	liters	3.79
cubic feet	cubic meters	0.03
cubic yards	cubic meters	0.76

To convert this	*to this*	*multiply by (rounded to hundredths)*
milliliters	fluid ounces	0.03
liters	pints	2.11
liters	quarts	1.06
liters	gallons	0.26
cubic meters	cubic feet	35.31
cubic meters	cubic yards	1.31
Temperature		
Fahrenheit	Celsius	.56 (after subtracting 31)
Celsius	Fahrenheit	1.82 (then add 32)
Farm products		
pounds per acre	kilograms per hectare	1.12
short tons per acre	kilograms per hectare	2.24
kilograms per hectare	metric tons per hectare	.001
kilograms per hectare	pounds per acre	0.89
tons per hectare	short tons per acre	0.45
tons per hectare	kilograms per hectare	1,000

Bushel/Weight Conversions

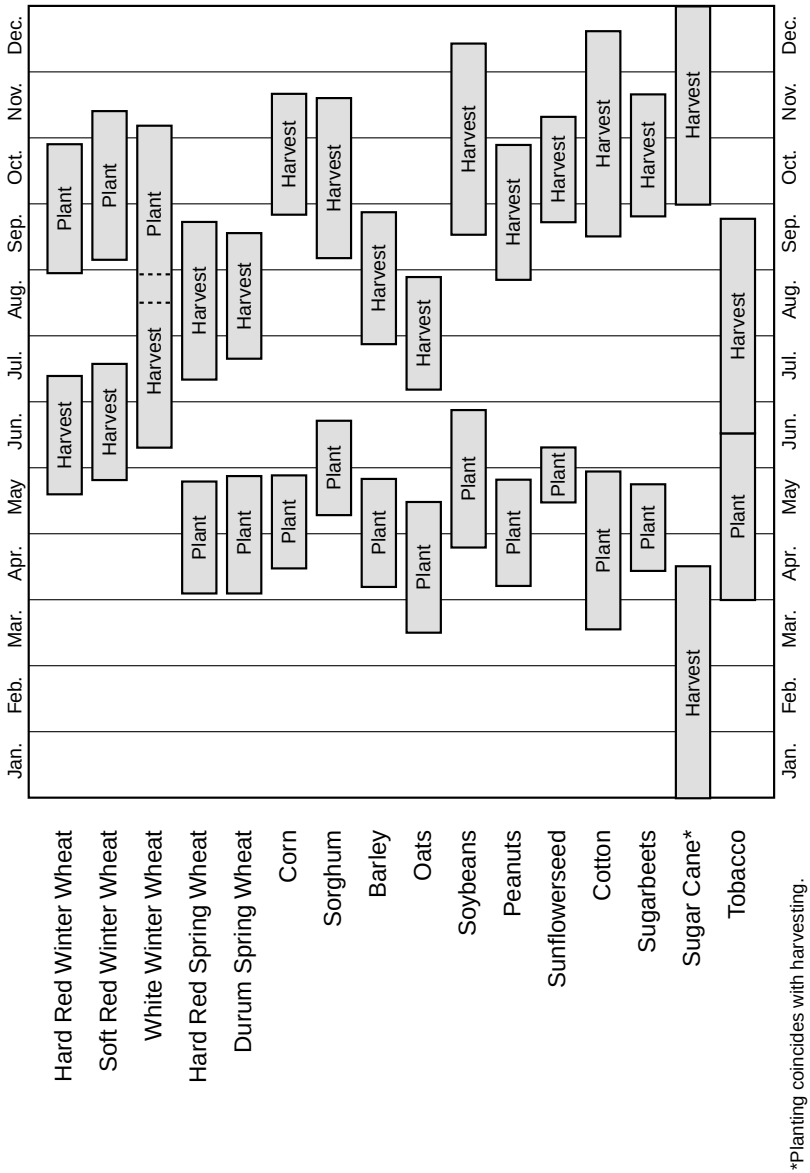
1 bushel of:	*weight in pounds*	*weight in kilograms*
wheat, soybeans, potatoes	60	27
corn, grain sorghum, rye, flaxseed	56	25
beets, carrots	50	23
barley, buckwheat, peaches	48	22
oats, cottonseed	32	14

1 metric ton of:	*weight in pounds*	*number of bushels*
wheat, soybeans, potatoes	2,204.6	36.74
corn, grain sorghum, rye, flaxseed	2,204.6	39.37
beets, carrots	2,204.6	44.09
barley, buckwheat, peaches	2,204.6	45.93
oats, cottonseed	2,204.6	68.89

Prepared by USDA, National Agricultural Statistics Service

Figure A-1.

Planting and Harvesting Calendar for Most Major U.S. Crop Areas[1]



*Planting coincides with harvesting.

[1]Represents areas where production is concentrated, but not full spectrum of planting and harvesting periods for each crop.

Acid soil. Soil with a pH of less than 7.0.

Acreage reporting date. The date by which insureds must report their planted acreage to their agent. These reports are essential because they help determine premium and liability. Reporting dates vary and are printed in crop insurance policies.

Actual production history (APH). An APH yield is a producer-certified report of the planted acreage and harvested production for each insured crop. MPCI coverage is based on at least 4 years of APH yields. If records are lacking, transitional yields (T-yields—a percentage of local yield averages) are used to help calculate coverage.

Actuarial table. The forms and related material for the crop year, which are available for public inspection in the crop insurance agent's office, show the amounts of insurance or production guarantees, coverage levels, premium rates, prices for computing indemnities, practices, insurable acreage, and other related information regarding crop insurance in the county.

Agricultural Adjustment Act of 1933 (P.L. 73-10). Signed May 12, 1933, this law introduced the price support programs, including production adjustments, and the incorporation of the Commodity Credit Corporation (CCC), under the laws of the State of Delaware on October 17, 1933. The program benefits were financed mostly by processing taxes on the specific commodity. The Act also made price support loans by the CCC mandatory for the designated "basic" (storable) commodities: corn, wheat, and cotton. Support for other commodities was authorized upon the recommendation by the Secretary of Agriculture with the President's approval.

Agricultural Adjustment Act of 1938 (P.L. 75-430). Signed February 16, 1938, this law was the first to make price support mandatory for corn, cotton, and wheat to help maintain a sufficient supply for low production times along with marketing quotas to keep supply in line with market demand. The 1938 Act is considered part of permanent agriculture legislation. Provisions of this law are often superseded by more current legislation. However, if the current legislation expires and new legislation is not enacted, the law reverts back to the permanent provisions of the 1938 Act, along with the Agricultural Act of 1949.

Agronomy. The science of crop production and soil management.

Alfalfa. A valuable leguminous crop for forage or hay used in livestock feeding.

Alkaline soil. Soil with a pH of more than 7.0.

Alternative farming. Production methods other than energy- and chemical intensive one-crop (monoculture) farming. Alternatives include using animal and green manure rather than chemical fertilizers, integrated pest management instead of chemical pesticides, reduced tillage, crop rotation (especially with legumes to add nitrogen), alternative crops, or diversification of the farm enterprise.

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 production of aquatic plants or animals in a controlled environment, such as ponds, raceways, tanks, or cages, for all or part of their life cycle. In the United States, baitfish, catfish, clams, crawfish, freshwater prawns, mussels, oysters, salmon, shrimp, tropical (or ornamental) fish, and trout account for most of the aquacultural production. Less widely established but growing species include alligator, hybrid striped bass, carp, eel, red fish, northern pike, sturgeon, and tilapia.

Arid climate. A dry climate with an annual precipitation usually less than 10 inches. Not suitable for crop production without irrigation.

Artificial insemination (AI). The mechanical injection of semen into the womb of the female animal with a syringe-like apparatus.

Back hoe. A shovel mounted on the rear of a tractor, hydraulically operated to dig trenches or pits in soil.

Base acreage. A farm's crop-specific acreage of wheat, feed grains, upland cotton, or rice eligible to enroll in commodity programs under legislation prior to the 1996 Farm Bill. Base acreage equalled land planted for harvest to the crop, plus any land enrolled in acreage reduction programs, plus land considered planted to the crop in 0,50/85-92 or under permitted normal flex or optional flex acreage shifts during a specified period of time. A farmer's crop acreage base is reduced by the portion of land placed in the Conservation Reserve Program, but is increased by CRP base acreage leaving the CRP.

Basic commodities. Six crops (corn, cotton, peanuts, rice, tobacco, and wheat) that are covered by parity-based price support provisions, provisions which have been suspended for the 1996 through 2002 crops of each of these commodities.

Biological control of pests. Control, but not total eradication, of insect pests achieved by using natural enemies, either indigenous or imported, or diseases to which the pest is susceptible. It includes such nontoxic pesticides as Bacillus thuringiensis (Bt).

Biologics. Immunization materials made from living or "killed" organisms and their products used for the detection and prevention of diseases; includes serums, vaccines, bacterins, antigens, and antitoxins.

Biotechnology. The use of technology, based on living systems, to develop processes and products for commercial, scientific, or other purposes. These include specific techniques of plant regeneration and gene manipulation and transfer (see also genetic engineering).

Blended credit. A form of export subsidy which combines direct Government export credit and credit guarantees to reduce the effective interest rate.

Brucellosis. A contagious disease in beef and dairy cattle, which causes abortion. Same disease in humans is known as undulant fever.

BST (bovine somatotropin) (also called BGH, for bovine growth hormone). A protein hormone produced naturally in the pituitary gland of cattle. Recombinant BST, or rBST, is BST produced using recombinant DNA biotechnology. BST controls the amount of milk produced by cows.

Cargo preference. A law that requires a certain portion of goods or commodities financed by the U.S. Government to be shipped on U.S. flag ships. The law has traditionally applied to P.L. 480 and other concessional financing or donations programs.

Carryover. Existing supplies of a farm commodity not used at the end of a marketing year, and remaining to be carried over into the next year. Marketing years generally start at the beginning of a new harvest for a commodity, and extend to the same time in the following year.

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 value of products sold.

Catastrophic risk protection (CAT). The lowest level of Federal crop insurance coverage. It provides a coverage level at 50 percent of the actual yields at 55 percent of the expected market price. Coverage is provided for an administrative fee.

Census of Agriculture. A count taken every 5 years of the number of farms, land in farms, crop acreage and production, livestock numbers and production, farm expenses, farm

facilities and equipment, farm tenure, value of farm products sold, farm size, type of farm, farm operator characteristics (age, race, sex), etc. Data are obtained for States and counties. USDA now administers the Census of Agriculture, which was previously done by the U.S. Bureau of the Census.

Checkoff programs. Research and promotion programs authorized by law and financed by assessments. The programs are paid for by specified industry members such as producers, importers, and handlers.

Combine. A self-propelled machine for harvesting grain and other seed crops. In one operation, it cuts, threshes, separates, and cleans the grain and scatters the straw.

Commodity certificates. Payments issued by the Commodity Credit Corporation (CCC) in lieu of cash payments to program participants. Holders of the certificates may exchange them with the CCC for CCC-owned commodities. With the exception of the upland cotton loan program, CCC authority to issue such certificates in lieu of cash payments was suspended for the 1996 through 2002 crops by the Federal Agriculture Improvement and Reform Act of 1996. Under the “special marketing loan provisions” for the upland cotton loan program, however, cotton user marketing certificates may be paid by CCC with commodity certificates.

Commodity Credit Corporation (CCC). A federally owned and operated corporation within USDA created to stabilize, support, and protect agricultural prices and farm income through loans, purchases, payments, and other operations. All money transactions for agricultural price and income support and related programs are handled through the CCC.

Commodity loan rates. Price per unit (pound, bushel, bale, or hundredweight) at which the CCC provides nonrecourse loans to farmers to enable them to hold program crops for later sale. Commodity loans under the 1996 Act can be recourse for sugar and will become recourse for dairy in 2000.

Complementary imports. Agricultural import items not produced in appreciable commercial volume in the United States, such as bananas, coffee, rubber, cocoa, tea, spices, and cordage fiber (see also supplementary imports).

Compost. Organic residues, or a mixture of organic residues and soil, which have been piled, moistened, and allowed to undergo biological decomposition for use as a fertilizer.

Concessional sales. Credit sales of a commodity in which the buyer is allowed more favorable payment terms than those on the open market. For example, Title I of the Food for Peace Program (P.L. 480) provides for financing sales of U.S. commodities with low-interest, long-term credit.

Conservation compliance. This represents a portion of the Highly Erodible Land Conservation provisions of the Food Security Act of 1985 that is designed to encourage the use of conservation practices on highly erodible cropland. To remain eligible for many USDA program benefits, farmers are required to crop highly erodible land under an approved conservation plan. Also see "Sodbuster."

Conservation district. Any unit of local government formed to carry out a local soil and water conservation program.

Conservation plan. A combination of land uses and practices to protect and improve soil productivity and to prevent soil deterioration. A conservation plan must be approved by the local conservation district for acreage offered in the Conservation Reserve Program. The plan sets forth the conservation measures and maintenance that the owner or operator will carry out during the term of the contract.

Conservation practices. Methods which reduce soil erosion and retain soil moisture. Major conservation practices include conservation tillage, crop rotation, contour farming, strip cropping, terraces, diversions, and grassed waterways.

Conservation Reserve Program (CRP). A major provision of the Food Security Act of 1985 designed to reduce erosion and protect water quality on millions of acres of farmland. Under the program, enrolled landowners agree to convert environmentally sensitive land to approved conserving uses for 10-15 years. In exchange, the landowner receives an annual rental payment as well as an initial cost-share payment for up to 50 percent of the cost of establishing permanent vegetative cover.

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. No-till is the most restrictive (soil-conserving) form of conservation tillage. Other practices include ridge-till, strip-till, and mulch-till.

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 acreage. Enrolled 1996 commodity base acreage under the 1996 Farm Act for wheat, feed grains, upland cotton, and rice, generally fixed for 1996 through 2002. A farmer may voluntarily choose to reduce contract acreage in subsequent years. Land leaving the CRP may be entered into a production flexibility contract if the land had an acreage base.

Contract crops. Crops eligible for production flexibility payments: wheat, corn, sorghum, barley, oats, rice, and upland cotton.

Cooperative. An organization formed for the purpose of producing and marketing goods or products owned collectively by members who share in the benefits.

Cooperative Extension System. A national, publicly funded, nonformal education network that links the educational and research resources and activities of USDA with land-grant universities in every State, territory, and the District of Columbia. The Federal partner is the Cooperative State Research, Education, and Extension Service. This unique Federal, State, and local partnership focuses on practical solutions to critical issues affecting people's daily lives.

Cost of production. The sum, measured in dollars, of all purchased inputs and other expenses necessary to produce farm products. Cost of production statistics may be expressed as an average per animal, per acre, or per unit of production (bushel, pound, or hundredweight) for all farms in an area or in the country.

County extension agent. An educator employed by a county and/or a State cooperative extension service to bring research-based agriculture and quality of life education to local people to help them address farm, home, and community problems at the local level.

Cover crop. A close-growing crop grown to protect and improve soils between periods of regular crops or between trees and vines in orchards and vineyards.

Crop rotation. The practice of growing different crops in recurring succession on the same land. Crop rotation plans are usually followed for the purpose of increasing soil fertility and maintaining good yields.

Crop year. Generally, the 12-month period from the beginning of harvest of a particular crop.

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 of custom work.

Dairy Export Incentive Program. A program that offers subsidies to exporters of U.S. dairy products to assist in competition with

other nations. Under the DEIP, exporters are awarded bonuses, enabling them to compete for sales in specified countries. The program was originally authorized by the 1985 Farm Act and reauthorized by the 1990 Farm Act. The 1996 Farm Act extends the program through 2002.

Disaster payments. Federal payments made to farmers because of a natural disaster when (1) planting is prevented or (2) crop yields are abnormally low because of adverse weather and related conditions. Disaster payments may be provided under existing legislation or under special legislation enacted after an extensive natural disaster.

Distance Education. Delivery of instructional material over a wide geographical area via one or more technologies, including video, computer, and laser.

DNA. Deoxyribonucleic acid, a polymeric chromosomal constituent of living cell nuclei, composed of deoxyribose (a sugar), phosphoric acid, and four nitrogen bases--adenine, cytosine, guanine, and thymine. It contains the genetic information for living organisms, and consists of two strands in the shape of a double helix. A gene is a piece of DNA.

Double crop. Two different crops grown on the same area in one growing season.

Dryland farming. A system of producing crops in semiarid regions (usually with less than 20 inches of annual rainfall) without the use of irrigation. Frequently, part of the land will lie fallow in alternate years to conserve moisture.

Erosion. The process in which water or wind moves soil from one location to another. Types of erosion are (1) sheet and rill—a general washing away of a thin uniform sheet of soil, or removal of soil in many small channels or incisions caused by rainfall or irrigation runoff; (2) gully—channels or incisions cut by concentrated water runoff after heavy rains; (3) ephemeral—a water-worn, short-lived or seasonal incision, wider, deeper and longer than a rill, but shallower and smaller than a gully; and (4) wind—the carrying away of dust and sediment by wind in areas of high prevailing winds or low annual rainfall.

Ethanol. An alcohol fuel that may be produced from an agricultural foodstock such as corn, sugarcane, or wood, and may be blended with gasoline to enhance octane, reduce automotive exhaust pollution, and reduce reliance on petroleum-based fuels.

Export Enhancement Program (EEP). Started in May 1985 under the Commodity Credit Corporation Charter Act to help U.S. exporters meet competitors' prices in subsidized markets. Under the EEP, exporters are awarded bonuses, enabling them to compete for sales in specified countries.

Extra-long staple (ELS) cotton. Cottons having a staple length of 1-3/8 inches or more, characterized by fineness and high-fiber strength. American types include American Pima and Sea Island cotton.

Family Farm. An agricultural business which (1) produces agricultural commodities for sale in such quantities so as to be recognized as a farm rather than a rural residence; (2) produces enough income (including off farm employment) to pay family and farm operating expenses, to pay debts, and to maintain the property; (3) is managed by the operator; (4) has a substantial amount of labor provided by the operator and family; and (5) may use seasonal labor during peak periods and a reasonable amount of full-time hired labor.

Farm. USDA defines a farm in 1997 as any place from which $1,000 or more of agricultural products were produced and sold or normally would have been sold during the year.

Farm Credit System. The system made up of cooperatively owned financial institutions in districts covering the United States and Puerto Rico that finance farm and farm-related mortgages and operating loans. Institutions within each district specialize in farmland loans and operating credit, or lending to farmer-owned supply, marketing, and

processing cooperatives. FCS institutions rely on the bond market as a source of funds.

Federal Agriculture Improvement and Reform Act of 1996 (1996 Farm Act) (P.L.104-127). The omnibus food and agriculture legislation signed into law on April 4, 1996, that provided a 7-year framework (1996-2002) for the Secretary of Agriculture to administer various agricultural and food programs. The 1996 Act fundamentally redesigns income support and supply management programs for producers of wheat, corn, grain sorghum, barley, oats, rice, and upland cotton. The 1996 Farm Act also makes program changes for dairy, sugar, and peanuts. Additionally, trade programs are more targeted and environmental programs are consolidated and extended in the 1996 Farm Act.

Feed grain. Any of several grains most commonly used for livestock or poultry feed, including corn, grain sorghum, oats, rye, and barley.

Fertilizer. Any organic or inorganic material of natural or synthetic origin which is added to soil to provide nutrients, including nitrogen, phosphorus, and potassium, necessary to sustain plant growth.

FFA. An organization for high school students studying vocational agriculture.

Flood plains. Lowland and relatively flat areas adjoining inland and coastal waters, including floodprone areas of islands. This land includes, at a minimum, those areas that are subject to a 1 percent or greater chance of flooding in any given year.

Food, Agriculture, Conservation, and Trade Act of 1990 (1990 Farm Act) (P.L. 101-624). Signed November 28, 1990, this 5-year farm bill applied to the 1991-95 crop programs. This Act continued the transition, started by the Food Security Act of 1985, toward greater market orientation of domestic commodity programs, the most notable changes being frozen minimum target prices and greater planting flexibility. Most of the commodity program provisions of this Act were superseded by the Federal Agriculture Improvement and Reform Act of 1996.

Food grain. Cereal seeds most commonly used for human food, chiefly wheat and rice.

Food Security Act of 1985 (1985 Farm Act) (P.L. 99-198). The omnibus food and agriculture legislation signed into law on December 23, 1985, that provided a 5-year framework (1986-90) for the Secretary of Agriculture to administer various agricultural and food programs.

Forage. Vegetable matter, fresh or preserved, that is gathered and fed to animals as roughage; includes alfalfa hay, corn silage, and other hay crops.

Forward contracting. A method of selling crops before harvest by which the buyer agrees to pay a specified price to a grower for a portion, or all, of the grower's crops.

Fungicide. A chemical substance used as a spray, dust, or disinfectant to kill fungi infesting plants or seeds.

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.

General Agreement on Tariffs and Trade (GATT). An agreement originally negotiated in 1947 to increase international trade by reducing tariffs and other trade barriers. The agreement provides a code of conduct for international commerce and a framework for periodic multilateral negotiations on trade liberalization and expansion. The Uruguay Round Agreement established the World Trade Organization (WTO) to replace the GATT. The WTO officially replaced the GATT on January 1, 1995.

Genetic engineering. Genetic modification of organisms by recombinant DNA, recombinant RNA, or other specific molecular gene transfer or exchange techniques.

Genome. All the genetic material in the chromosomes of a particular organism.

Gleaning. Collecting of unharvested crops from the fields, or obtaining agricultural products from farmers, processors, or retailers without charge.

Gopher. The Internet Gopher client/server is a distributed information delivery system around which a campuswide information system can readily be constructed. While providing a delivery vehicle for local information, Gopher facilitates access to other Gopher and information servers throughout the world.

Grade A milk. Milk, also referred to as fluid grade, produced under sanitary conditions that qualify it for fluid (beverage) consumption. Only Grade A milk is regulated under Federal milk marketing orders.

Grade B milk. Milk, also referred to as manufacturing grade, not meeting Grade A standards. Less stringent standards generally apply.

Grafting. The process of inserting a scion of a specified variety into a stem, root, or branch of another plant so that a permanent union is achieved.

Great Plains. A level to gently sloping region of the United States that lies between the Rockies and approximately the 98th meridian. The area is subject to recurring droughts and high winds. It consists of parts of North Dakota, South Dakota, Montana, Nebraska, Wyoming, Kansas, Colorado, Oklahoma, Texas, and New Mexico.

Green manure. Any crop or plant grown and plowed under to improve the soil, by adding organic matter and subsequently releasing plant nutrients, especially nitrogen.

Ground water. Water beneath the Earth's surface between saturated soil and rock, which supplies wells and springs.

Group Risk Plan (GRP). A crop insurance plan that uses an index—the expected county yield—as the basis for protection. When the yield for the insured crop in the county falls below the yield level chosen by the farmer, an indemnity is paid. GRP protection involves less paperwork and costs less than the farm-level coverage described above. However, individual crop losses may not be covered if the county yield does not suffer a similar level of loss.

Hedgerow. Trees or shrubs grown closely together so that branches intertwine to form a continuous row.

Herbicide. Any agent or chemical used to destroy plants, especially weeds.

Humus. The well decomposed, relatively stable portion of the partly or wholly decayed organic matter in a soil, which provides nutrients and helps the soil retain moisture.

Hydroponics. Growing of plants in water containing dissolved nutrients, rather than in soil. This process is being used in greenhouses for intensive off-season production of vegetables.

Infrastructure. The transportation network, communications systems, financial institutions, and other public and private services necessary for economic activity.

Integrated crop management. An agriculture management system that integrates all controllable agricultural production factors for long-term sustained productivity, profitability, and ecological soundness.

Integrated pest management (IPM). The control of pests or diseases by using an array of crop production strategies, combined with careful monitoring of insect pests or weed populations and other methods. Some approaches include selection of resistant varieties, timing of cultivation, biological control methods, and minimal use of chemical pesticides so that natural enemies of pests are not destroyed. These approaches are used to anticipate and prevent pests and diseases from reaching economically damaging levels.

International trade barriers. Regulations used by governments to restrict imports from

other countries. Examples include tariffs, embargoes, import quotas, and unnecessary sanitary restrictions.

Internet. The global connection of interconnected local, mid-level, and wide-area automated information/communications networks.

Land-grant universities. Institutions, including State colleges and universities and Tuskegee University, eligible to receive funds under the Morrill Acts of 1862 and 1890. The Federal Government granted land to each State and territory to encourage practical education in agriculture, homemaking, and mechanical arts.

Land-use planning. Decisionmaking process to determine present and future uses of land. The resulting plan is the key element of a comprehensive plan describing recommended location and intensity of development of public and private land uses such as residential, commercial, industrial, recreational, and agricultural.

Leaching. The process of removal of soluble materials by the passage of water through soil.

Legumes. A family of plants that includes many valuable food and forage species such as peas, beans, soybeans, peanuts, clovers, alfalfas, and sweet clovers. Legumes can convert nitrogen from the air to nitrates in the soil through a process known as nitrogen fixation. Many of these species are used as cover crops and are plowed under for soil improvement.

Lint. Cotton fiber remaining after the seeds have been ginned out.

Loan deficiency payments. A provision begun in the 1985 Farm Act to provide direct payments to producers who, although eligible to obtain price support loans for wheat, feed grains, upland cotton, rice, or oilseeds and thereby receive marketing loan gains, agree not to obtain loans.

Loan rate. The price per unit (bushel, bale, pound, or hundredweight) at which the Commodity Credit Corporation will provide loans to farmers enabling them to hold their crops for later sale.

Market Access Program (MAP). Formerly the Market Promotion Program. Participating organizations include nonprofit trade associations, State and regional trade groups, and private companies. Fund authority is capped at $90 million annually for FY 1996-2002.

Market basket of farm foods. Average quantities of U.S. farm foods purchased annually per household in a given 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 allotments. Provides each processor or producer of a particular commodity a specific limit on sales for the year, above which penalties would apply.

Marketing orders. Federal marketing orders authorize agricultural producers to promote orderly marketing by influencing such factors as supply and quality, and to pool funds for promotion and research. Marketing orders are initiated by the industry, and are approved by the Secretary of Agriculture and by a vote among producers. Once approved, a marketing order is mandatory.

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 charges for assembling, storing, processing, transporting, and distributing the products.

Marketing year. Year beginning at harvest time during which a crop moves to market.

Metropolitan statistical area (MSA). A county or group of contiguous counties that 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 MSA if they

are socially and economically integrated with a central city.

Migrant farmworker. A person who travels across State or county boundaries to do agricultural work of a seasonal or other temporary nature, and who is required to be absent overnight from his or her permanent place of residence. Exceptions are immediate family members of an agricultural employer or a farm labor contractor, and temporary foreign workers.

Multiple-peril crop insurance (MPCI). Refers to the numerous perils (drought, excess moisture, cold and frost, wind, flood, and unavoidable damage from insects and disease) generally covered by a Federal crop insurance policy. Policies covering one peril, like hail, exist and are not federally subsidized.

National forest. A Federal reservation dedicated to protection and management of natural resources for a variety of benefits — including water, forage, wildlife habitat, wood, recreation, and minerals. National forests are administered by USDA's Forest Service, while national parks are administered by the Interior Department's National Park 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.

Nematode. Microscopic soil worm, which may attack root or other structures of plants and cause extensive damage.

Net farm income. A measurement of the profit or loss associated with a given year's production. It is an approximation of the net value of agricultural production, regardless of whether the commodities were sold, fed, or placed in inventory during the year. Net farm income equals the difference between gross farm income and total expenses. It includes nonmoney items such as depreciation, the consumption of farm-grown food, and the net imputed rental value of operator dwellings. Additions to inventory are treated as income.

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 (excluding money earned from working for other farmers) received by farm operator households.

Nonpoint source pollution. Pollutants that cannot be traced to a specific source, including stormwater runoff from urban and agricultural areas.

Nonprogram crops. Crops—such as potatoes, vegetables, fruits, and hay—that are not included in Federal price support programs.

Nonrecourse loan program. Provides operating capital to producers of wheat, feed grains, cotton, peanuts, tobacco, rice, and oilseeds. Sugar processors are also eligible for nonrecourse loans. Farmers or processors participating in government commodity programs may pledge a quantity of a commodity as collateral and obtain a loan from the CCC at a commodity-specific, per-unit loan rate. The borrower may repay the loan with interest within a specified period and regain control of the commodity, or forfeit the commodity to the CCC after the specified period as full settlement of the loan with no penalty. For those commodities eligible for marketing loan benefits, producers may repay the loan at the world price (rice and upland cotton) or posted county price (wheat, feed grains, and oilseeds).

Nutrient. A chemical element or compound that is essential for the metabolism and growth of an organism.

Off-farm income. Includes wages and salaries from working for other farmers, plus nonfarm income, for all owner operator families (whether they live on a farm or not).

Oilseed crops. Primarily soybeans, and other crops such as peanuts, cottonseed, sunflower seed, flaxseed, safflower seed, rapeseed, sesame seed, castor beans, canola, rapeseed, and mustard seeds used to produce edible and/or inedible oils, as well as high-protein animal meal.

Oilseed meal. The product obtained by grinding the cakes, chips, or flakes that remain after most of the oil is removed from oilseeds. Used as a feedstuff for livestock and poultry.

Organic farming. There is no universally accepted definition, but in general organic farming is a production system which avoids or largely excludes the use of synthetically compounded fertilizers, pesticides, growth regulators, and livestock feed additives. To the maximum extent feasible, organic farming systems rely on crop rotation, crop residues, animal manures, legumes, green manure, off-farm organic wastes, mechanical cultivation, mineral bearing rocks, and aspects of biological pest control to maintain soil productivity and tilth; to supply plant nutrients; and to control weeds, insects, and other pests.

Payment limitations. Limitations set by law on the amount of money any one person may receive in Federal farm program payments each year under the feed grain, wheat, cotton, rice, and other farm programs.

Percolation. The downward movement of water through soil under the influence of gravity.

Permanent legislation. Legislation that would be in effect in the absence of all temporary amendments (Farm Acts). The Agricultural Adjustment Act of 1938 and the Agricultural Act of 1949 serve as the basic laws authorizing the major commodity programs. Technically, each new Farm Act amends the permanent legislation for a specified period.

Plant germplasm. Living material such as seeds, rootstock, or leaf plant tissue from which new plants can grow.

Pomology. The science or study of growing fruit.

Price index. An indicator of average price change for a group of commodities that compares price for those same commodities in some other period, commonly called the base period.

Price support level. The price for a unit of a farm commodity (pound, ton) that the Government will support through price-support loans, purchases, and/or payments. Price support levels are determined by law and are set by the Secretary of Agriculture.

Price support programs. Government programs that aim to keep farm prices from falling below specific minimum levels. Price support programs for selected commodities (peanuts, tobacco, sugar, and milk) are carried out through loans or purchases. With price-support loans, producers (or processors in the case of sugar) use their production of a commodity as collateral for a loan with the Commodity Credit Corporation (CCC). Loans enable the loan taker to store the commodity during periods of low prices. The loans may be redeemed later if commodity prices rise sufficiently to make the sale of the commodity on the market profitable, or the loan taker may forfeit the commodity used as collateral for the loan to CCC in lieu of cash repayment. In the case of milk, CCC is authorized through December 31, 1999, to purchase manufactured dairy products in order to support the price of fluid milk at statutorily prescribed levels.

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 money markets. These associations are an integral part of the Farm Credit System.

Production flexibility contract payments. The payments to be made to farmers for contract crops in 1996 through 2002 under the 1996 Farm Act. Payments for each crop are allocated each fiscal year based on budgetary levels and crop-specific percentages in the 1996 Farm Act.

Production flexibility contract payment quantity. The quantity of production eligible for production flexibility contract payments under the 1996 Farm Act. Payment quantity is calculated as the farm's program yield (per acre) multiplied by 85 percent of the farm's contract acreage.

Production flexibility contract payment rate. The amount paid per unit of production to each participating farmer for eligible payment production under the 1996 Farm Act.

Productive capacity. The amount that could be produced within the next season if all the resources currently available were fully employed using the best available technology. Productive capacity increases whenever the available resources increase or the production of those resources increases.

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 productivity indexes measure 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 work hour, 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.

Program crops. Crops for which Federal support programs are available to producers, including wheat, corn, barley, grain sorghum, oats, extra long staple and upland cotton, rice, oilseeds, tobacco, peanuts, and sugar.

Public Law 480 (P.L. 480). Common name for the Agricultural Trade Development and Assistance Act of 1954, which seeks to expand foreign markets for U.S. agricultural products, combat hunger, and encourage economic development in developing countries. Title I of P.L. 480, also called the Food for Peace Program, makes U.S. agricultural commodities available through long-term dollar credit sales at low interest rates for up to 30 years. Donations for humanitarian food needs are provided under Title II. Title III authorizes "food for development" grants.

Rangeland. Land which is predominantly grasses, grasslike plants, or shrubs suitable for grazing and browsing. Rangeland includes natural grasslands, savannahs, many wetlands, some deserts, tundra, and certain shrub communities. It also includes areas seeded to native or adapted and introduced species that are managed like native vegetation.

Renewable resources. Resources such as forests, rangeland, soil, and water that can be restored and improved.

Revenue insurance. RMA's three revenue insurance plans all provide a guaranteed level of revenue by different means. Generally, indemnities are paid when any combination of yield and price shortfalls results in revenue that is less than the revenue guarantee. Revenue is determined differently by the particular plans of insurance. All three plans provide traditional MPCI yield protection and include provisions to account for price variability.

Riparian rights. Legal water rights of a person owning land containing or bordering on a water course or other body of water in or to its banks, bed, or waters.

RNA (ribonucleic acid). A molecule similar to DNA that functions primarily to decode instructions for protein synthesis that are carried by genes.

Ruminant. Animal having a stomach with four compartments (rumen, reticulum, omasum, and abomasum). Their digestive process is more complex than that of animals having a true stomach. Ruminants include cattle, sheep, and goats, as well as deer, bison, buffalo, camels, and giraffes.

Rural. An area that has a population of fewer than 2,500 inhabitants and is outside an urban area. A rural area does not apply only to farm residences or to sparsely settled areas, since a small town is rural as long as it meets the above criteria.

Sales closing date. The final date that an application for crop insurance may be filed. This is the date for producers to make changes in their crop insurance coverage for the crop year.

Saline soil. A soil containing enough soluble salts to impair its productivity for plants.

Silage. Prepared by chopping green forage (grass, legumes, field corn, etc.) into an air-tight chamber, where it is compressed to exclude air and undergoes an acid fermentation that retards spoilage. Contains about 65 percent moisture.

Silviculture. A branch of forestry dealing with the development and care of forests.

Sodbuster. A portion of the Highly Erodible Land Conservation provision of the Food Security Act of 1985 that is designed to discourage the conversion of highly erodible land from extensive conserving uses, such as grasslands and woodlands, to intensive production of agricultural commodities. If highly erodible grasslands or woodlands are converted to intensive crop production without the application of appropriate conservation practices, producers may lose eligibility for many USDA program benefits. Also see "Conservation Compliance."

Staple. Term used to designate length of fiber in cotton, wool, or flax.

State Agricultural Experiment Station. State-operated institutions, established under the Hatch Act of 1887 and connected to land-grant universities in each State, which carry out research of local and regional importance in the areas of food, agriculture, and natural resources.

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 include cattle, meat, fruit, vegetables, and tobacco (see complementary imports).

Sustainable agriculture. An integrated system of plant and animal production practices having a site-specific application that will, over the long term, satisfy food and fiber needs, enhance environmental quality and natural resources, make the most efficient use of nonrenewable resources and on-farm resources, integrate natural biological cycles and controls, sustain the economic viability of farm operations, and enhance the quality of life.

Swampbuster. This provision was authorized by the Food Security Act of 1985; it discourages the conversion of natural wetlands to cropland use. With some exceptions, producers converting a wetland area to cropland may lose eligibility for many USDA program benefits.

Terminal market. A metropolitan market that handles agricultural commodities.

Tissue culture. The technique of growing a whole plant from a single engineered cell or piece of plant tissue.

Unit cost. The average cost 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. A concept defining an area that has a population of 2,500 or more inhabitants.

Uruguay Round. The Uruguay Round of Multilateral Trade Negotiations (UR) under the auspices of the GATT; a trade agreement designed to open world agricultural markets. The UR agricultural agreement covers four areas: export subsidies, market access, internal supports, and sanitary and phytosanitary rules. The agreement is implemented over a 6-year period, 1995-2000.

Vegetative cover. Trees or perennial grasses, legumes, or shrubs with an expected lifespan of 5 years or more.

Viticulture. The science and practice of growing grapes.

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. The United States is generally divided into 18 major drainage areas and 160 principal river drainage basins containing some 12,700 smaller watersheds.

Water table. The upper limit of the part of the soil or underlying rock material that is wholly saturated with water.

Wetlands. Land that is characterized by an abundance of moisture and that is inundated by surface or ground water often enough to support a prevalence of vegetation typically adapted for life in saturated soil conditions.

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.

Zoonotic diseases. Diseases that, under natural conditions, are communicable from animals to humans.

4-H. International youth organization that empowers young people 5-19 years old through programs and activities that foster agricultural, science, and technology literacy; citizenship; and other lifelong living skills, such as self-esteem, career and personal development. The national 4-H staff is located in the Families, 4-H, and Nutrition unit of the Cooperative State Research, Education, and Extension Service. The 4-Hs stand for Head, Heart, Hands, and Health.

1890 Land-Grant Colleges and Universities and Tuskegee University. Historically Black land-grant colleges and universities. Through the Act of August 30, 1890, and several other authorities, these institutions may receive Federal funds for agricultural research, extension, and teaching.

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USDA Kids page: *www.usda.gov/news/usdakids/index.htm*
Meat and poultry product recalls: *http://www.fsis.usda.gov/oa/news/xrecalls.htm*
Gateway to Government Food Safety Information: *http://www.foodsafety.gov*
The Food Guide Pyramid: A Guide to Daily Food Choices:
http://www.nal.usda.gov.8001/py/pmap.htm
The Children's Food Guide Pyramid: *http://www.usda.gov/cnpp/KidsPyra/*
Nutrition Information: *http://www.nal.usda.gov/fnic/cgi-bin/nut_search.pl*
Home Canning Guides: *http://www.ext.usu.edu/publica/foodpubs.htm*
Civil Rights: *http://www.usda.gov/da/cr.html*
Millennium Green: *http://www.millenniumgreen@usda.gov*
Millennium Gardens: *http://www.usda.gov/gardens*
USDA Celebrating the Millennium: *http://www.usda.gov/millennium/contents.htm*
Home Gardening: http://www.usda.gov/news/garden.htm
Millennium Calendar: ESRA.usda.gov *http://www.recgov.org/usda/esra.html*
Farmers Markets: *http://www.ams.usda.gov/marketing.htm*
Small Farms: *http://www.usda.gov/oce/smallfarm/sfhome.htm*
Market News: *http://www.ams.usda.gov/marketnews.htm*
Importing and Exporting Animals: *http://www.usda.gov/news/animals.htm*
Safeguarding Your Pet: *http://www.aphis.usda.gov/oa/pettheft.html*
Backyard Conservation: *http://www.nhq.nrcs.usda.gov/CCS/Backyard.html*
National Resources Inventory: *http://www.nhq.nrcs.usda.gov/CCS/NRIrlse.html*
Forest Service Recreation Information: *http://www.fs.fed.us/recreation/recreation.shtml*
Forest Service—2002 Winter Olympics: *http://www.fs.fed.us/r4/2002/*
U.S. National Arboretum: *http://www.ars-grin.gov/ars/Beltsville/na/*
USDA Plant Hardiness Zone Map: *http://www.ars-grin.gov/na/hardines.html*
National Agricultural Library: *http://www.nalusda.gov/*
USDA History Collection: *http://www.nalusda.gov/speccoll/collect/history/index.htm*
Graphics of Agricultural Production: *http://www.usda.gov/nass/aggraphs/graphics.htm*
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