CHAPTER 11

Research, Education, and Economics

Agricultural Research Service

The Agricultural Research Service (ARS) is the principal in-house scientific research agency of the USDA. The agency is committed to providing access to agricultural information and developing new knowlege and technology needed to solve technical agricultural problems. Research is done to ensure an abundance of high-quality, safe food and other agricutural products to meet the nutritional needs of the American consumer, to sustain a viable economy, and to maintain a quality environment and natural resource base. Research is conducted at the ARS headquarters in Beltsville, MD, as well as throughout over 100 national laboratories in the United States.

ARS research has contributed to improved crop yields and more environmentally sensitive farming techniques. In addition to enhancing productivity, today's agricultural research is as much about human health as it is about crop production.

For example, a powerful but expensive anticancer drug could become more plentiful, thanks to a new process developed by ARS scientists. The process makes the drug—called taxol—from laboratory-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 and 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—

ARS Research: Selected Highlights

ARS scientists in Peoria, IL, and in New Orleans and Philadelphia 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 rations. 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, as a soluble dietary fiber or thickener, or as industrial adhesives and water-based paint thickeners.

ARS studies in Boston, MA, 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 1940s, wiping out an estimated 77 million elms. The two new 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 pest resistance and the ability to grow where temperatures dip to –40 degrees, 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. CO^2 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 abandonment of a cherished symbol of past American agriculture, the moldboard plow used to break up the prairies. Instead, many farmers now leave crop residue on or near the soil surface, where the residue readily decays to 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.

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 1840s. 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 the 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 the 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.

For more information about ARS, see its home page: **http://www.ars.usda.gov**

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 3.3 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 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, MD, 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. About 170 people work at NAL, including 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

Every aspect of the infrastructure and the food system it supports is fed, fundamentally, with new knowledge, through research and development, data collection, and information dissemination.

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 (AGRICultural OnLine Access) 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 home page 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 8:30 a.m. to 4:30 p.m., Eastern time, Monday through Friday, except Federal holidays. Many of NAL's services are available anytime through the NAL homepage.

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

NAL Selected Highlights:

■ Electronic Delivery of Documents Expands and Preservation Plans Developed

Working toward its goal of becoming a "library without walls," NAL encourages its patrons to send requests and receive materials electronically. Requests submitted electronically to NAL account for about 80 percent of all document delivery requests received. NAL has also significantly increased its electronic delivery of materials to patrons. This number is nearly 40 percent. NAL has take the lead in developing plans to preserve USDA electronic publications. Preservation and long-term access of these publications are an important issue due to the ephemeral nature of electronic formats.

■ Dietary Supplement Database Established

In its continuous effort to keep abreast of key issues affecting U.S. food and nutrition, NAL, working with the National Institutes of Health, has launched an Internet site on dietary supplements. The user-friendly database helps researchers and consumers find current information on the growing number of supplements available. For more information about the database, visit the Web site at: **http://ods.od.nih.gov/databases/ibids.html**

Cooperative State Research, Education, and Extension Service

The Cooperative State Research, Education, and Extension Service (CSREES) sees agriculture as a knowledge-based, global enterprise sustained by the innovation of scientists and educators. Its mission is to advance knowledge for agriculture, the environment, human health and well-being, and communities.

CSREES works with land-grant universities, historically Black colleges and universities (HBCUs), Hispanic and Native American institutions, as well as 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 State universities, 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.

The CSREES domestic and international research, education, and extension networks are strengthened with partnerships that maximize resources and program impact. CSREES partners include:

- More than 130 colleges of agriculture, including land-grant institutions in each State and Territory;
- 59 agricultural experiment stations with more than 9,500 scientists conducting research;
- 57 cooperative extension services with more than 9,683 local extension agent educators working in 3,150 counties;
- 63 schools of forestry;
- 17 1890 historically Black land-grant institutions and Tuskegee University;
- 27 colleges of veterinary medicine;
- 42 schools and colleges of family and consumer sciences;
- 31 1994 Native American land-grant institutions;
- 175 Hispanic-serving institutions
- Federal and State governments
- Nonprofit organizations
- Private sector

CSREES research, education, and extension leadership is provided through programs in:

- Communications
- Competitive Programs
- Economic and Community Systems
- Families, 4-H, and Nutrition
- Information Systems and Technology Management
- Natural Resources and Environment
- Office of Extramural Programs
- Plant and Animal Systems
- Science and Education Resource Development

CSREES programs include:

- Model education programs in sustainable agriculture, water quality, food safety, risk management, children and families, health, environmental stewardship, and community economic development.

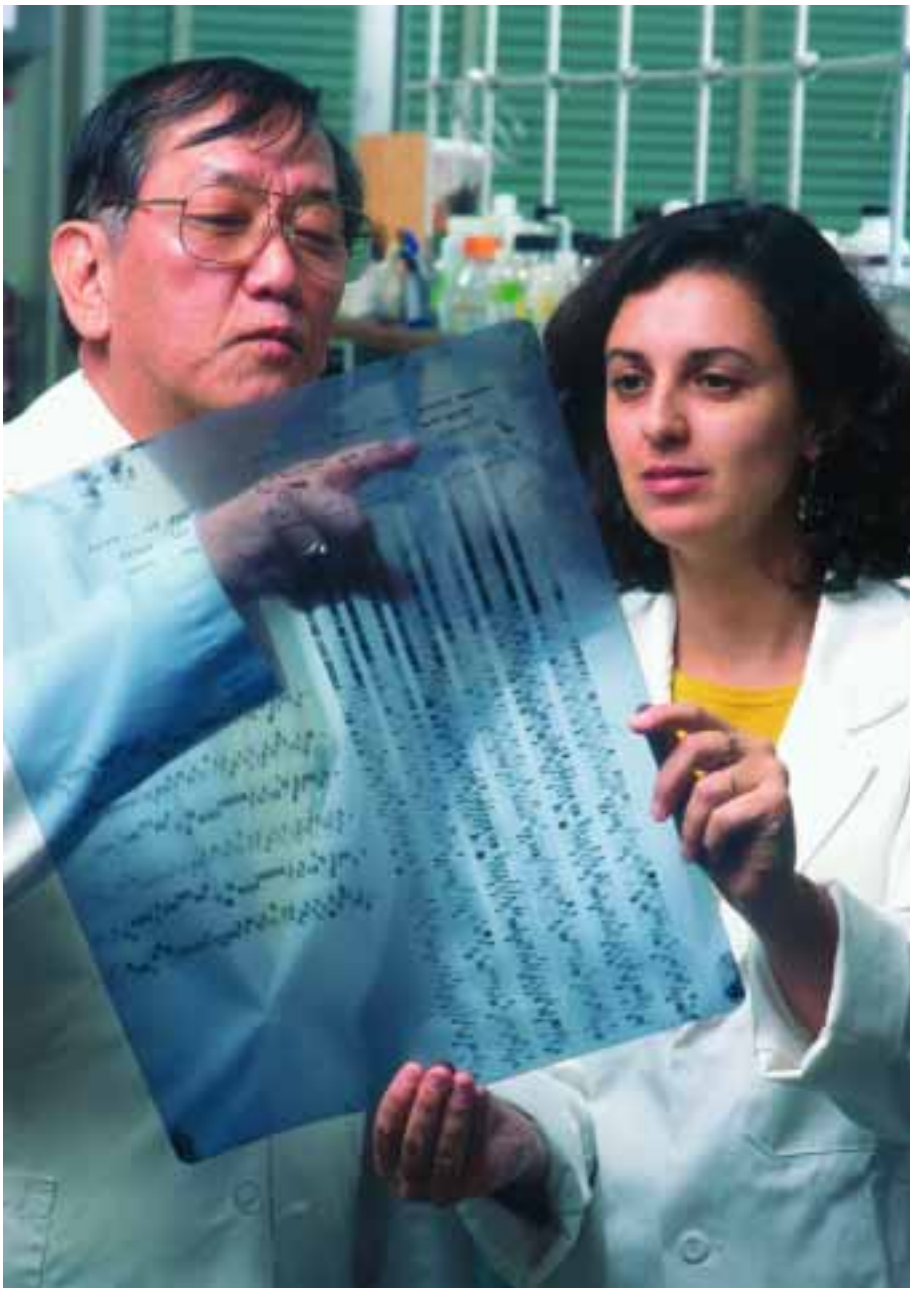
- Higher education programs to develop the scientific and professional expertise needed to advance the food, agricultural, and natural resource systems and maintain excellence in college and university teaching programs.

- Cooperative partnerships involving:
  —over 9,600 scientists engaged in research at 59 State agricultural experiment stations, 17 1890 historically Black land-grant colleges and universities, and Tuskegee University
  —over 9,680 local extension agents working in 3,150 counties
  —over 700,000 volunteers working in the Master Extension Volunteer programs…at a dollar value (computed at $16.52 per hour) of $1.9 billion
  —3 million trained volunteers working with national outreach education programs
  —6.8 million youth involved in 4-H programs that increase self-esteem and enhance problem-solving skills in a positive, support environment.

- The National Research Initiative to support 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, floods, and terrorism.



CSREES Highlights

New Uses for Agricultural Materials
USDA and land-grant university scientists are finding new uses for agricultural materials of all kinds. Years of research and development are now paying off and scientists have successfully developed bioplastics from corn, potato, wheat, and rice starch. The problem with most petroleum-based plastics, such as polystyrene, is that they don't degrade and are filling up landfill space. But starch-based plastic polymers are environmentally preferable because they are biodegradable.

Virginia Tech scientists have demonstrated in the laboratory that cotton gin waste is a suitable source for fuel ethanol. Successful development could convert existing gin waste, which typically gets plowed back into the soil, into 680,000 gallons of ethanol each year. This could create 100 new jobs in southeast Virginia. Large-scale testing is under way.

Roadmaps to Better Crops and Animals
Arizona researchers are halfway there to mapping the 50,000 genes in corn, America's most important crop. They are sharing information with public and private researchers to develop improved traits in corn and genetically similar crops like wheat, barley, rice, and oats.

Arkansas researchers have engineered plants to produce two human proteins that may be involved in the regulation of cancer metastasis. Large-scale, low-cost production of these two cancer-related proteins in plants may facilitate their practical use in early cancer diagnosis or treatment. Farmers may become pharmaceutical producers.

Texas A&M researchers have cloned a bull calf from cells frozen for 15 years. The resulting calf is believed to be the first animal specifically cloned for disease resistance. The cells used to clone the calf are from a bull that was naturally resistant to brucellosis, tuberculosis, and salmonellosis–infectious diseases that can be transmitted among cattle to humans. Breeding resistence into cattle could reduce pathogens in meat and milk. Ranchers who cannot afford to vaccinate or test their herds for these diseases would benefit from this research.

Looking Out for the Small Farm
The CSREES Small Farm Program works in partnership with a network of State small farm specialists in the land-grant university system to improve the economic viability of small farm and ranch operators nationwide. The CSREES *Small Farm Digest* newsletter targets farmers, ranchers, and small farm specialists at local, State, and Federal levels with information about direct marketing techniques for farm-raised goods and other timely topics.

The CSREES' Sustainable Agriculture Research and Education (SARE) Program advances farming and ranching systems that are profitable and environmentally sound for families and communities. SARE's national outreach arm, the Sustainable Agriculture Network (SAN), combines SARE-funded research results with other information to produce practical publications on a variety of topics, including marketing.

Protecting Water Quality

As a result of a widely publicized Utah Extension program, residential water users are measuring sprinkler pressure, coverage, and water saturation per hour to reduce their water consumption in one of the fastest growing States. Utah is the second driest U.S. State and if population growth and current water consumption continue at their present rate, Salt Lake City could "run dry" by 2020. An added benefit of the Utah Extension program is that residents using it are saving 25 percent on water bills and reducing water consumption by 50 percent.

The Fond du Lac Tribal and Community College in Wisconsin is playing a key role in the St. Louis River Watch Program, which protects the watershed and improves water quality. Since 1997, the college has supported water sampling in the river, using students in 21 area schools, teacher training, and data collection. An annual conference to measure results and encourage stewardship is held by the college. The St. Louis River contributes significant amounts of water, nutrients, and pollutants to Lake Superior. The river and lake are important to the region's water supply and recreation.

Healthier Lives Through Research and Education

Land-grant universities are considering cultural differences as they address nutritional needs of different populations as different cultures obtain nutrients in different ways. Caucasians use milk for a protein source. Hispanics get more calcium from cheese and beans, while Asians use seaweed and soy. California Extension specialists conduct the Expanded Food and Nutrition Education Program (EFNEP) for low-income Vietnamese families in five counties. A California Extension program, "Cooking for Better Health," helps low-income Hispanic families improve dietary practices. Program graduates ate fewer fried foods, drank lower fat milk, and bought lower fat foods. Colorado Extension educators conduct a bilingual program called "La Cocina Saludable" (The Healthy Kitchen) to provide Hispanic grandmothers with nutritional information. Seventy-eight percent surveyed made positive nutritional changes as a result of the program. Connecticut EFNEP reached 10,000 low-income Latino children and their caretakers with a bilingual nutrition education program emphasizing the importance of eating fresh produce. Salud!, a nutrition marketing campaign, features Latino celebrities who "toast" good health by promoting fresh fruits and vegetables. This program reached more than 50,000 children at a cost of only $1.60 per child in 2000.

Pest Management

Researchers in Delaware found that sprays containing viruses control gypsy moths. Producers using this pest control technique have cut insecticide spraying from 67,000 acres to almost zero, at a savings of $2 million.

Local Problem Solving

Nevada land-grant specialists, in a collaboration of public and private organizations, including Nevada and California firefighters, are teaching homeowners how to live more safely in a high wildfire-hazard environment. Extension specialists have developed 72 wildfire-rating maps on various vegetation types covering 3,200 square miles for use by developers and firefighters. These include recommendations for managing vegetation and creating a buffer zone between houses and dry grass.

Purdue students are mentoring kids who live in public housing by helping them with homework and basic life skills. College students gain life experience while helping children improve their grades. Georgia 4-H community service club members are helping kids to read. Participants are spending more time reading, and their teachers are seeing improved literacy skills.

Managing Agricultural Waste

A cooperative multi-State effort to protect the Chesapeake Bay led Maryland researchers to promote the use of riparian buffers–areas of trees, shrubs, and vegetation adjacent to bodies of waters that capture pollutants before they reach the bay. An educational video has increased riparian awareness throughout the Chesapeake Bay area and was distributed in all 50 States and several foreign countries, including Germany and Albania. This effort addresses the problem of non-point-source pollution from urban and rural sources as the primary cause of water quality problems in the United States. Many States are now combining urban and agricultural efforts to protect water supplies.

For More Information

More information on CSREES can be found at: **http://www.reeusda.gov/**

Economic Research Service

Are you a congressional staffer who wants to know how U.S. agriculture would be affected if China joined the World Trade Organization (WTO)? Are you a reporter seeking insights on future patterns of adoption of genetically engineered crops? Are you an industry analyst who has heard the meatpacking industry has fewer and fewer firms and wonders why this increasing concentration occurred and what it means? Are you looking for farm income and farm program payment information to use in designing a new safety net program for small or limited-resource farmers? Are you a nutrition educator who wonders what Americans eat and why they make the food choices they do?

If so, you are in luck. These are just a few of the many timely issues addressed by the Economic Research Service (ERS)—USDA's premier source of social science information and research. *ERS conducts social science research for a purpose*. That purpose is to build the knowledge base for informed and effective decisionmaking on economic issues related to agriculture, food, natural resources, and rural economies.

ERS publications are easy to find. They are posted in their entirety, and summarized for easy access to the main ideas, on the ERS Web site: **http://www.ers.usda.gov**

Copies are also available from the USDA Order Desk (1-800-999-6779 or 703-605-6220). For assistance in locating specific publications, periodicals, or data products, please call the ERS Information Center at (202) 694-5050 or email **service@ers.usda.gov**.

Finding the Facts

Commodity Markets. What's up and what's down in the crop and livestock markets? The ERS commodity situation and outlook series includes monthly and quarterly reports containing current and prospective information on commodity supply, demand, and price conditions. Annual situation and outlook yearbooks that include historical data series on acreage, yield, supply, domestic use, foreign trade, and price, as well as topical articles pertinent to understanding the U.S. and global markets, are also available. From the ERS Web site, you will find links to situation and outlook reports for cotton and wool, feed, fruit and tree nuts; livestock, dairy and poultry; aquaculture; oil crops, rice, sugar and sweeteners; tobacco, vegetable and specialty crops, and wheat. *Commodity briefing rooms* can also be found on the ERS Web site. These sites provide one-stop-shopping entrees into commodity data from all USDA agencies.

Agricultural Trade. Are prospects bright or dim for U.S. agricultural trade? To find out, visit the ERS Web site where you will find the *Outlook for U.S. Agricultural Trade*, which offers the latest value and volume of U.S. farm exports by commodity and region, and also the agricultural trade balance, import commodities, and export outlook. Or take a look at the *Trade Briefing Room,* which will hook you directly into the *Foreign Agricultural Trade of the United States*—a trade database that you can search according to the commodity, country or region, and time period that interests you.

Farm Income and Finance. Are farmers doing better or worse economically than in the past? How many farmers make a living "just farming" these days? What percentage of farm income comes from government payments? You can find the answer to these questions in the ERS

periodical *Agricultural Income and Finance*. Issued 3 times a year, this report provides historical estimates and forecasts of farm sector financial information that will allow you to gauge the financial well-being of the Nation's farmers and ranchers. It includes farm sector receipts, expenses, debt, assets, and costs of producing crops and livestock. Or visit the *Farm Sector Performance Briefing Room*, where you will find links to the latest farm income forecasts, other farm financial data, and related research reports.

Food Consumption and Prices. How much of their personal income do Americans spend on food these days? (Answer: 10 percent) How much of their food expenditures are on "food away from home"? (Answer: 47 percent) For direct access to data on retail food prices, food expenditures, and food costs, and access to numerous publications on America's eating habits, visit the *Food Markets Briefing Room* on the ERS Web site.

Resource Trends and Indicators. How much cropland is being lost to urban uses? The answer—it turns out that acres in cropland have remained quite stable over time, varying from 440 to 460 million acres since 1945—can be found in the ERS *Land Use and Value Briefing Room*. Are farmers using more or fewer chemicals today than in the past? For the answer to this and many other questions about how natural resources (land and water) and commercial inputs (energy, nutrients, pesticides, and machinery) are used in the agricultural sector, see the *Agricultural Resources and Environmental Indicators* report, which is posted on ERS' Web site.

Rural Economic Indicators. Which rural counties are experiencing population growth? What is the median household income in your county? What proportion of your State's rural jobs are in farm and farm-related industries? Does commercial bank restructuring impair local rural economic growth? The *Rural Development Briefing Room* provides a rich source of information about rural population dynamics, employment change, jobs by industry, and credit and finance. You can also learn about Federal funds going to rural America simply by going to the ERS Web site.

Staying on Top of Special Topics

At ERS you can get more than just the economic facts. ERS' unique contribution in USDA is to bring the perspective of economic analysis to many critical issues facing farmers, agribusinesses, consumers, and policymakers. For example, ERS can tell you the economic benefits to society and the costs to the food industry of implementing food safety protections. Or ERS can tell you which sectors of the economy have gained the most economically, and by how much, from implementation of the North American Free Trade Agreement. Many special topics are highlighted on the ERS Web Site Briefing Rooms. Among the topics covered are:

New Farm Bill Legislation. Find out what the Farm Security and Rural Investment Act of 2002 will mean for farmers, ranchers, the food industry, and consumers in America. Learn about new provisions concerning commodity programs, rural development, nutrition, farm credit, and conservation.

Domestic Conservation and Environmental Policies. Find out what policy instruments are available to encourage farmers to adopt conservation and environmental practices, and how effective they have been.

Food Safety. Learn that foodborne illnesses from a few selected pathogens cost society at least $6.9 billion annually in medical costs and lost productivity. Find out what your government is doing to improve the safety of the Nation's food supply, and what you as a consumer can do to keep your family's food safe.

Food Security and Hunger. Find out that although most households (nearly 90 percent) in the United States are food secure, during 2000 some 11 million U.S. households (10.3 percent of total) were food insecure—that is, they did not always have access to enough food to meet basic needs.

World Trade Organization. Find discussions of the three pillars of agricultural trade negotiations: export subsidies, domestic support, and tariffs as well as other trade negotiation issues. The Web site also contains an analysis of China's potential membership in the WTO; for example, did you predict that the largest increases in China's agricultural imports after full accession are likely to be for corn ($587 million), wheat ($543 million), and cotton ($359 million)?

Research Reports: Indepth Understanding of Complex Issues

ERS underpins its contributions to understanding the topics of the day with peer-reviewed social science research. The results of many research projects are published as ERS research reports as well as in professional journals. All ERS reports are available in PDF format on the ERS Web site at **http://www.ers.usda.gov.** The following is a selection of indepth research reports published in 2001:

Changing Structure of Global Food Consumption and Trade, ERS, WRS No. 01-1, May 2001. Higher income, urbanization, other demographic shifts, improved transportation, and consumer perceptions regarding quality and safety are changing global food consumption patterns. Shifts in food consumption have led to increased trade and changes in the composition of world agricultural trade. Given different diets, food expenditure and food budget responses to income and price changes vary between developing and developed countries. In developing countries, higher income results in increased demand for meat products, often leading to increased import of livestock feed. Diet diversification and increasing demand for better quality and labor-saving products have increased imports of high-value and processed food products in developed countries. Consumer groups in developed countries have also brought attention to organic production of food and the topic of animal welfare. One way in which the public and private sectors have responded to consumer demand for these quality attributes has been by developing and implementing mandatory and voluntary quality control, management, and assurance schemes.

Structural and Financial Characteristics of U.S. Farms: 2001 Family Farm Report , ERS, Agriculture Information Bulletin No. 768, May 2001. Family farms vary widely in size and other characteristics, ranging from very small retirement and residential farms to establishments with sales in the millions of dollars. The farm typology developed by ERS categorizes farms into groups based on the primary occupation of the operator and sales class of the farm. The typology groups reflect operators' expectations from farming, position in the life cycle, and dependence on agriculture. The groups differ in their contribution to agriculture production, degree of specialization, extent of participation in commodity and conservation programs, and dependence on farm income. These (and other) differences are discussed in this report.

Economic Issues in Agricultural Biotechnology, ERS, Agriculture Information Bulletin No. 762, March 2001. Agricultural biotechnology has been advancing very rapidly, and while it presents many promises, it also poses many questions. Many dimensions to agricultural biotechnology need to be considered to adequately inform public policy. Policy analysis is made more difficult by the fact that agricultural biotechnology encompasses many policy issues addressed in very different ways. We have identified several key areas—agricultural research policy, industry structure, production and marketing, consumer issues and future world demand—where agricultural biotechnology is dramatically affecting the public policy agenda. This report focuses on the economic aspects of these issues and addresses some current and timely issues as well as longer term issues.

Household Food Security in the United States, 2000, ERS, Food and Nutrition Research Report No. 21, March 2002. This report, based on data from the September 2000 food security survey, provides the most recent statistics on the food security of U.S. households, as well as on how much they spent on food and the extent to which food-insecure households participated in Federal and community food assistance programs. Between 1998 and 2000, food insecurity fell by 11 percent and hunger by 16 percent. The declines were widespread, affecting most regions and types of households. For the year ending September 2000, nearly 90 percent of American households were food secure for the entire year. The rest were food insecure at least some time during the year, meaning they did not always have access to enough food for active, healthy lives for all household members.

How Will the Phaseout of Federal Estate Taxes Affect Farmers?, ERS, Agriculture Information Bulletin No. 751-02, March 2002. Concern among policymakers that the Federal estate tax might force the liquidation of some family farms has resulted in the enactment of a variety of special provisions over the years. Providing relief to farmers and other small business owners was the primary impetus for the 1997 changes to Federal estate and gift tax policies and a major objective of the 2001 law that will phase out and eventually repeal the Federal estate tax. While only about 4 percent of all farm estates owe Federal estate taxes, a much larger percentage of farm estates must file an estate tax return, make use of special farm provisions, alter their business practices, or engage in costly estate planning to reduce the impact of the estate tax on their farm business. Thus, the phaseout and repeal of the Federal estate tax will affect a much broader group of farmers than just those who owe tax.

What Does ERS Look Like?
Located in Washington, D.C., ERS has approximately 500 employees. The agency's work is structured among three program divisions: Food and Rural Economics, Market and Trade Economics, and Resource Economics.

For more information about the agency, visit the ERS Web site:
http://www.ers.usda.gov

National Agricultural Statistics Service

The National Agricultural Statistics Service (NASS), "The Fact Finders for U.S. Agriculture," is USDA's official source of comprehensive agricultural statistics. The only way to "tell the story" of the phenomenal success of American agriculture is by having data available that measure productivity.

The NASS mission is to provide timely, accurate, and useful statistics in service to U.S. agriculture. These statistics are not only important to tell the success story of American agriculture, but they are vital to support the efficient handling and marketing of commodities in today's global market. This mission, which serves both producers and consumers by allowing for informed decisions, is accomplished through the collection and dissemination of official USDA statistics through weekly, monthly, quarterly, and annual surveys and the 5-year census of agriculture.

Agricultural statistics have been vital to providing for stable markets and serving public interests since 1791, when George Washington personally conducted the Nation's first agricultural survey and compiled the results. Seventy-two years later, in 1863, the newly established USDA, named the "People's Department" by its founder, Abraham Lincoln, issued the first USDA crop report.

Why Are Ag Statistics Important?
Besides helping producers get a fair market price for the goods produced on their farms and ranches, agriculture statistics help Americans plan for a future sustained by a safe and secure food supply. The data allow a growing multitude of people from various sectors of the agricultural industry to make decisions affecting agriculture that are based on fact, not opinion. NASS has successfully met many challenges over the last 138 years to provide data to meet the changing demands 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:

Associated with, but distinct from, scientific research and development is the continued need for public sector provision of objective, consistent data and information to level the basis for decisionmaking among participants in the food and agricultural system.

■ Producers and buyers rely on timely, accurate data to conduct business on an even playing field, within a market place where price is determined by real facts rather than speculation and rumors.

■ Farm organizations and government use these sound statistics to resolve environmental issues, rather than basing decisions on worst-case scenarios.

■ Exporters of American farm products rely on accurate supply information.

■ Producers use the data to determine emerging markets for new and existing commodities or to decide when to change their enterprises.

■ Transportation and storage companies rely on the statistics to efficiently move agricultural products to market.

■ Suppliers use the data to allocate the necessary inputs farmers need to grow their crops or raise livestock.

■ Local and Federal government policymakers rely on accurate data to address natural disasters, crop insurance, and depressed farm prices.

■ Other USDA agencies use the statistical data to accomplish important programs for the Department, whether it be carrying out agricultural policy concerning farm program legislation, commodity programs, agricultural research, or rural development.

Statistics Based Primarily on Producer Reports

Most estimates are based on information gathered from producers surveyed through personal and telephone interviews or through mailed questionnaires. Other estimates are based on surveys of grain elevators, hatcheries, and other agribusinesses, and on administrative data such as slaughter records. Their voluntary cooperation is absolutely vital to a workable and meaningful statistical program. The success of this cooperative relationship can be attributed to producers' recognition of the importance of the survey results and to the confidential treatment NASS accords all reported information. Other estimates are based on surveys of grain elevators, hatcheries, and other agribusinesses, and on administrative data such as slaughter records. In addition, NASS relies on actual field counts and measurements for some crop forecasts.

Data collected from these varied sources are summarized by the NASS State Statistical Offices and then sent to the Agency's Agricultural Statistics Board in Washington, DC, whose members determine and issue State and national official statistics. Reports are released to the public according to a published calendar.

A Model of Federal–State Cooperation

The NASS network of 45 State Statistical Offices, serving all 50 States, and the Puerto Rico Field Office operate through cooperative agreements with State departments of agriculture or universities. This enables NASS to be responsive to "grassroots" data needs, while eliminating duplication of effort and ensuring statistical products are consistent with national-level standards.

What Data Are Available?

Current Ag Surveys

An abundance of current and historical agricultural information, covering 120 crops and 45 livestock items across the 50 States, is available from NASS' 400 national reports and 9,000 State reports on topics including:

- 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.

In addition to the information above, statistics on more specialized commodities including hop stocks, mink, cherries, cranberries, lentils, and peppermint oil are also available. Enhanced statistics for the nursery, equine, and aquaculture industries have been enthusiastically received by data users.

2002 Census of Agriculture

You Make it Known—Agriculture Counts!

Thanks to America's farmers and ranchers who supply the answers needed to produce a reliable, accurate, and timely picture of our Nation's agriculture.

The above slogan carries an important message to over 2 million farms and ranches across America, as the National Agricultural Statistics Service began the enormous task for the Department of Agriculture of the mailout of the census of agriculture questionnaires in December 2002. Farmers and ranchers, the cornerstone of the Nation's food and fiber system, are the only ones who can provide the information needed to compile the 5-year complete accounting of American agricultural production demographics, structure, economics, and other characteristics.

Response to the 2002 Census of Agriculture is required by law (Title 7, U.S. Code) to ensure all operations, large and small, are properly counted and represented. That same law requires that individual producer information is safeguarded and strictly confidential. High-quality census data depend on a complete response from everyone receiving a form.

Results from the 2002 Census of Agriculture will be released on the NASS Web site (**www.usda.gov/nass/**) in early February 2004. The census of agriculture is the only source for uniform, comprehensive agricultural data for every county in the Nation.

What Will the Picture Reveal for 2002?

The 2002 Census of Agriculture will give us a complete statistical picture of America's diverse farming and ranching industry, and it will help provide new information to analyze trends.

The Census of Agriculture results provide data on the number of farms, land in farms, land use and ownership, operator characteristics, crops, machinery and equipment, livestock, fertilizer, poultry, chemicals, market value of products, irrigated land, production expenditures, type of organization, farm programs, and corporate structure. Data are also published for Puerto Rico, Guam, the Virgin Islands, the Northern Mariana Islands, and the American Samoa.

Where Can You Find Current Survey and Census of Agriculture Data?

NASS reports are released at scheduled times on the Internet, in print, and on CD-ROM. All census and survey reports are accessible free of charge from the NASS Web site at **www.usda.gov/nass/**. You can also find census of agriculture data through local NASS State Statistical Offices, depository libraries, universities, and other State government offices. For questions, contact the Agricultural Statistics Hotline at 800-727-9540.