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Charles Valentine Riley  
Memorial Foundation

## **Food, Agriculture and Natural Resources Research**

### **Economic Research Service: Specialized Agency Functions and Public Goods' Provision**

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## Charles Valentine Riley Memorial Foundation

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### Author

Katherine Smith Evans, Administrator of USDA Economic Research Service from 2007 to 2011, one of various research and managerial positions held over 30 years.

### About the Charles Valentine Riley Memorial Foundation

The Charles Valentine Riley Memorial Foundation (RMF) is committed to promoting a broader and more complete understanding of agriculture and to build upon Charles Valentine Riley's legacy as a "whole picture" person with a vision for enhancing agriculture through scientific knowledge. RMF, founded in 1985, recognizes that agriculture is the most basic human endeavor and that a vibrant, robust, food, agricultural, forestry, and environmental-resource system is essential for human progress and world peace. RMF's goal is to have all world citizens involved in creating a sustainable food and agriculture enterprise within a responsible rural landscape.

### RMF's Commitment for Increased Federal Research Investment

RMF supports growing each of the key components of the agricultural research funding portfolio that supports the national system delivering results for the public good: **competitive grants**, which take advantage of innovation at public and private universities, and other organizations with scientific and technical expertise; **capacity funds**, for state (universities) and federal agencies such as USDA's Agriculture Research Service, Economic Research Service and Forest Service, to continue to provide a stable scientific workforce and research sites that conduct research requiring long-term commitment and potential high-risk/high-payoff solutions, while maintaining the capacity to rapidly deal with crisis situations; and **public-private partnerships**, such as the Foundation of Food and Agricultural Research, a nonprofit corporation that matches public funds with private funds to conduct research on problems of national and international significance.

### About This Report

As noted, RMF supports growing each of the key methods for funding agricultural research within a national system that produces results for the public good. Intramural research and statistics are key parts of that system. RMF believes that a strong and multidisciplinary agricultural research program in the United States is essential to the long-term national interest and that a strong national program is built on a combination of intramural and extramural scientific programs. USDA Economic Research Service (ERS) is a key intramural research, market information and statistical arm of the USDA that also employs cooperative research and competitive grants programs to bring outside expertise and collaborators to bear on research priorities. RMF supports the development of this report highlighting the special and unique functions of the USDA Economic Research Service (ERS) because it recognizes, as does the National Academies of Science report, *The Value of Social, Behavioral, and Economic Sciences to National Priorities*<sup>1</sup> (<https://www.nap.edu/read/24790/chapter/1>), the importance of social science research to solve the big problems of producing food sustainably. RMF believes a clear explication of the unique and important roles that ERS plays is warranted, and that this report fulfills that need. ERS is funded by Congress through an annual appropriation that supports the agency's research and research cooperators, as well as ERS' interrelated function as a Principal Statistical Agency.

### Disclaimer

*Although RMF supports increased federal investment in food, agricultural and natural resources research, that message is not the intent of this report. The purpose is to simply document what has been done with existing resources. Where quotes are included, they do not necessarily reflect the position of RMF.*

## Highlights

Through the U.S. Department of Agriculture's Economic Research Service (ERS), the nation invests \$87 million to support decision-making in the agriculture, food and related sectors. This capability is critically important to these sectors, which comprise 5.5 percent of U.S. gross domestic product (GDP) and have significant impact on 46 million rural Americans and the more than half of the country's land and resource base that is used for agriculture. ERS is a research agency with outsized impact that serves the public goals of USDA programs and contributes to the practice of agricultural and applied economics. This report summarizes intramural and extramural research and outlines how results are used to fulfill its role as a designated statistical agency and to provide market situation and outlook information. This report also summarizes the synergies created by current programs.

**The ERS intramural research program** provides USDA program agencies with findings that allow them to evaluate, assess and improve their services to the American public. Over the last five decades, ERS' professional, acclaimed and peer-reviewed research has demonstrably informed and affected program decisions by the USDA's Chief Economist, Farm Services Agency, Food and Nutrition Service, Natural Resources Conservation Service, Risk Management Agency, rural development agencies and other units. This public good research would not have been implemented by the private sector nor conceived by most academic researchers on their own. It is fostered by intimate knowledge of and collaboration with the USDA program agencies. It has at times required access to data and information only accessible within the USDA. It tackles research topics that may be considered risky ventures due to scale, the costs required to resolve sparse data, and, in some cases, the short time period required to obtain results needed to guide policy or program decisions. The agency's research products are found in policy briefs, on the ERS website and published as ERS peer-reviewed reports and in peer-reviewed journals. They also are found and in popular outlets and frequently cited by news media.

**ERS has long used cooperative research agreements and competitive grants** to collaborate with researchers at universities or other research institutions whose skills complement and enhance its own research human capital. From FY 2013 to FY 2017, ERS funded 227 cooperative agreements amounting to \$17.8 million with more than 100 institutions across the nation. ERS also has administered a number of sizable competitive grants programs. The grant programs help to attract the best and brightest economists to focus on USDA priorities in programs such as food and nutrition programs. ERS competitive grants also encourage researchers outside the agency to newly apply their skills to agricultural research; for example, the application of behavioral economics to food, agricultural and agro-environmental policies and programs. In this way, ERS builds unique collaborations that familiarize extramural researchers with valuable national data sets.

**ERS is one of 13 Principal Statistical Agencies** of the United States, as designated by the Office of Management and Budget. The designation gives the agency special protections and requires it to follow unique provisions of several laws and four statistical policy directives. ERS

manages access to results of the Agricultural Resources Management Survey (ARMS), a fundamental source of information on agricultural practices, farm businesses and farm household financials. ARMS data are primary input for ERS farm income reports and projections. ARMS data also are a gold mine for research on complex relationships in the farm sector. Another important ERS statistical database is derived from the first nationally representative survey of American households to collect unique and comprehensive data about household food purchases and acquisitions, including those from USDA nutrition assistance programs. This database, too, substantially expands the base of evidence on which ERS intramural and extramural researchers can assess and inform the performance of USDA programs. Among other important statistics generated by ERS are those on agricultural productivity, food security and the consumer price index for food.

The strength of its research program and the intimacy of its agency analysts with the unique data it generates make ERS pivotal — indeed, absolutely essential — to the USDA’s short-term and long-run **projections of domestic and world commodity markets**. ERS leads an interagency collaboration to generate the USDA’s annual 10-year baseline projections of domestic and world markets, the supply of and demand for major commodities, and agricultural trade. These situation and outlook reports directly affect commodity markets. The baseline projections define the state of the world against which the economic and market implications of new or proposed policies can be compared.

**The interplay of ERS functions is synergistic.** ERS research programs and ERS market situation and outlook work feed into, inform and strengthen one another. Neither would be as good without the other. The agency’s statistical functions, which it performs with great authority, provide unique data for evidence-based program analysis and for research on the complex interactions among variables that influence program and policy outcomes. The accessibility of the data for economic and statistical analyses by researchers outside of ERS multiplies their relevance and impact. ERS support of extramural research complements and fast-tracks the best intellectual input to the agency’s priorities. ERS programs not only inform USDA decisions, but also other national and international bodies’ decisions about myriad aspects of food systems, agriculture, natural resources and rural communities. They do so in a manner that is technically authoritative, backstopped by professional acclaim and carried into the future by attention to forward-looking innovation and the nurturing of the next generation of agricultural and applied economists.

*“ERS plays a unique and important role, both for citizens of the United States and for members of the agricultural and applied economics profession. [ERS] offers objective data and economic analysis of the highest quality, taking a long-term perspective ...and aiming to meet the nation’s needs. [ERS] has innovated in data collection, policy design and analytical methods. Thanks to the ERS, Americans are well-informed about U.S. farm management, food access, nutrition and rural development, [and] Congress has been able to design cost-effective programs.”*

— Scott M. Swinton, President, Agricultural and Applied Economics Association, and Professor of Agricultural, Food and Resource Economics, Michigan State University

## Foreword

The USDA Economic Research Service (ERS) plays a unique and important role, both for citizens of the United States and for members of the agricultural and applied economics profession. The ERS has informed markets and policy for a half century in its current form and for over a century in total. Why has it endured? As this report explains, the ERS provides authoritative information as a *public good*. In economist parlance, public goods are goods that cannot be owned. Access to public information cannot be restricted, so it cannot be bought and sold. As a result, the private sector tends to produce less than what society would be willing to pay for.

The ERS provides long-term statistical data series, market forecasts and policy analysis — on both an in-depth and rapid-turnaround basis. From my perspective as a professor in a state land-grant university college of agriculture and natural resources, the ERS occupies a critically important niche. First, it offers objective data and economic analysis of the highest quality, taking a long-term perspective. Second, in aiming to meet the nation's needs, it has innovated in data collection, policy design and analytical methods. Thanks to the ERS, Americans are well-informed about U.S. farm management, food access, nutrition and rural development. Thanks to the ERS, Congress has been able to design cost-effective programs, like the Conservation Reserve, that meet multiple objectives. Thanks to the ERS, the economics profession has new methods for purposes such as measuring agricultural productivity.

ERS data and analyses are fundamental to U.S. agricultural, food and natural resource policy. Look no further than the 2015 National Academies report, *A Framework for Assessing Effects of the Food System*<sup>1</sup>. To put the recommended assessment framework into action, the report repeatedly cites ERS resources — for its farming and nutrition data series, for its timely reports and for innovative metrics, like its measurements of agricultural productivity and returns to research. What makes ERS research so important is not only its quality, but also its user-friendly delivery. True, ERS staff routinely win research quality awards for policy analysis from the Agricultural and Applied Economics Association (AAEA). But the agency is truly dominant in awards for quality of communication via its own magazine *Amber Waves*, the AAEA magazine *Choices*, and the journal *Applied Economics Perspectives and Policy*.

To explain what the ERS does and why it matters, I can think of no one better than Kitty Smith Evans. In a career at ERS that began as productive researcher and culminated as agency administrator, she sustained and enhanced the ERS legacy of providing rigorous, objective and useful economic information.

— Scott M. Swinton, President, Agricultural and Applied Economics Association, and  
Professor of Agricultural, Food and Resource Economics, Michigan State University

## Introduction

Through the U.S. Department of Agriculture's Economic Research Service (ERS), the nation invests \$87 million to support decision-making in the agriculture, food and related sectors, which comprise 5.5 percent of U.S. gross domestic product (GDP), impact 46 million rural Americans and involve more than half of the country's land and resource base for agriculture. ERS is a research agency with outsized impact that serves the public goals of USDA programs and contributes to the practice of agricultural and applied economics.

From its inception, ERS has served the public by producing results that are distinctly public goods — goods available freely to all in a portfolio that could not be reproduced by the private sector. The USDA first established a market intelligence and farm economics agency in 1905. Research areas were established for farm organization, cost of production, farm labor, farm finance, land economics, agricultural history and rural life. A 1953 reorganization split ERS' predecessor agency, the Bureau of Agricultural Economics, into components of the Agricultural Research Service and of the Agricultural Marketing Service. The modern and reconsolidated version of ERS was established in 1961. Its mandate included a focus on developing unbiased information and analysis to inform agricultural policy. In 1962, it expanded its research program to include water quality, rural economic development and natural resource policy.

*“[During the time] I served as Secretary of Agriculture ... I can say quite candidly that hardly a week went by, and I might say hardly a day went by, when I didn't confer with or review material from ERS professionals which provided me very important guideposts along the decision-making path.”*

— Orville Freeman, Secretary, U.S. Department of Agriculture, 1961-1969 (quote from transcript of “Founding FathERS,” a film made upon the 50th anniversary of ERS)

Over the last 56 years, ERS has been central to U.S. food, agricultural and natural resource economics, both within government and academia. Today the agency's 310 staff and professionals conduct analyses that are used and relied upon by other USDA and federal agencies. It supports extramural research through grants to and cooperative agreements with academic and other research organizations, and is one of the nation's Principal Statistical Agencies. These interrelated functions are rooted in history and highly modernized to serve a dynamic and globalized food, agricultural and natural resource system. The ERS Annual Report for FY 2016<sup>2</sup> documents the range of ERS's reach, drilling down from very broad subject matter research areas to very specific research projects and the uses of the agency's findings.

In this special report, we focus on the agency's contributions and accomplishments along functional lines.

# **Guide and Description of Specialized Agency Functions**

## **Intramural Research**

The Economic Research Service's intramural research program has been guided by the needs of public-sector food, agricultural, natural resource and rural community decision-makers. It provides objective, policy-relevant research to advance our understanding of complex relationships that inform thinking about and taking action on everything from farm finance to food waste, from research and productivity to rural health care, from soil conservation to commodity markets, and more. While economic researchers outside of ERS also have addressed these topics, they lack the mandate to work with and on the issues of USDA program agencies, as well as ready access to some program data and the general trust of those agencies.

Here we provide a few examples of ERS intramural research that have benefited USDA policy and USDA agency program decision-making.

### **Example: Natural Resource Conservation**

ERS research in the 1980s demonstrated that the then-new Conservation Reserve Program could, with some operational changes, be run more efficiently and effectively. As a consequence, the USDA Natural Resource Conservation Service (NRCS) implemented a bidding system — that ERS helped design— to enroll acreage at a lower cost per unit of soil conservation gained. After ERS research demonstrated the extent to which conservation incentive programs could be enhanced by tying receipt of commodity and price support payments to participation in NRCS soil and water conservation programs (a linkage referred to as conservation compliance), the 2008 Food, Conservation and Energy Act made conservation compliance the law. More recently, ERS research on the relationship between crop insurance coverage and conservation practices informed policy decisions that led to tying farmers' receipt of subsidized insurance from USDA Risk Management Agency (RMA) to adoption of at least a minimal level of resource conservation. ERS research on targeting the level of conservation support to those lands on which the greatest environmental gains can be achieved has informed NRCS Environmental Quality Incentives, Wetlands Reserve and Conservation Stewardship programs, as well as thinking about water quality incentives for the Chesapeake Bay.

### **Example: International Trade**

ERS global market research and rigorous analysis of trade agreement possibilities feed directly into USDA's trade negotiations. This has roots in ERS' path-breaking work to measure domestic support policies that helped lay the foundation for the Uruguay Round Agreement on Agriculture. U.S. and global trade are affected by growth and stability of world markets, global supplies and prices, changes in exchange rates, government support for agriculture and trade-protection policies. Thus, ERS research on multiple aspects of trade and their complex



interactions with one another are critical to the agency's development of economic models that can be used for just-in-time research informing trade policy and negotiations.

### **Example: The Rural Economy**

ERS research on rural America addresses the economic, social, spatial, demographic, farm and nonfarm factors that affect the income and poverty status of rural residents, and derives implications for USDA rural economic development programs. ERS research was instrumental in demonstrating the declining contribution of farming to rural economies and what that implies for the focus of rural economic development. The agency has evaluated the relative success of alternative national, regional and local program approaches to rural development. ERS developed conceptually accurate classifications of rurality and urban influences on rurality, with the goal of increased efficiency for multiple USDA programs that have differential disbursements to rural counties or areas. ERS research has determined that rural child poverty trends so far in the 21st century are due more to demographically driven changes in income inequality than to average real family income. These kinds of findings on complex interrelationships help avoid naiveté in well-meaning rural development efforts.

### **Example: Food Systems**

The rise of “big box” stores, increasing availability of new food products and new expressions of consumer preferences are among the factors demanding research on different facets of food systems. ERS research has examined numerous ways in which such trends affect the outcome of USDA and other government programs. ERS is a leader in understanding “food deserts” and what they mean for nutrition and food costs of people living in these areas. ERS research led to precise definitions of food deserts that were subsequently adopted for use in federal programs that target those areas for grocery chain location incentives. ERS research also has examined the relationship between energy prices and the use of energy in food production, the price of food and implications for food security.

### **Contributions to Intra-USDA Research Priorities**

ERS collaborates with a number of USDA agencies, including Agricultural Research Service, National Institute of Food and Agriculture, National Agricultural Statistics Service and Animal and Plant Health Protection Service, on interagency research priorities. For example, ERS examined the market for pollination services and the land use implications for pollinator abundance in the context of a broader USDA focus on pollinator health. Similarly, ERS has recently fulfilled the economic and social science research that informs integrated, interagency research on food waste, antimicrobial resistance and other timely issues.

## High-Quality, Well-Recognized Intramural Research

In these and other research areas, ERS has been recognized as an intellectual leader in the universe of food, agricultural, resource and rural economics. In fact, ERS is ranked in the top 5 percent of academic and nonacademic economic institutions for economic research overall<sup>3</sup>. ERS “has emerged as an acknowledged intellectual leader in the construction and integration of national and state-level productivity accounts in agriculture” (Shumway, et al., 2016)<sup>4</sup>. ERS is a national leader in economic research on food assistance programs and on the structure of agriculture. The agency’s leaders and research staff have received the highest professional awards. Since 2000, nine of the 100 individuals made Fellows of the Agricultural and Applied Economic Association, a prestigious honor, were current or former ERS staff or leaders. This indicates the caliber of intramural economic research that informs USDA programs.

*“I was fortunate to see up close how effective ERS is in forming and improving policy. ERS economists introduced sophisticated market incentives to from the modern Conservation Reserve Program, which is a model for payment for ecosystem services. ERS was crucial in promoting advanced thinking on managing trade-offs between food and fuel production, and in informing commodity programs to enhance equity and efficiency given political constraints.”*

— David Zilberman, President-Elect, Agricultural and Applied Economics Association, and Professor, Agricultural and Resource Economics, University of California, Berkeley

## Extramural Research

ERS has long used cooperative research agreements to partner with university faculty whose talents complement the agency’s intramural research goals. While its traditional collaborators have been at 1862 and 1890 land-grant institutions, ERS also has engaged economists and social scientists at private and public colleges and universities and relevant nonprofit organizations. From FY 2013 to FY 2017, ERS funded 227 cooperative agreements amounting to \$17.8 million with more than 100 institutions nationwide. These cooperative agreements produce research that addresses policy-relevant economic issues related to agriculture, food, the environment and rural America. ERS also has authorization to employ competitive granting. The agency has used grants programs to supplement its intramural research capacity and to bring economic expertise from outside the agricultural arena to bear on food and agricultural issues.

ERS competitive grants programs include the following:

### Grants Under the Food and Nutrition Research Program, 2003-2008

ERS’ first and longest-lived extramural competitive grants program supplemented the agency’s already formidable and impactful intramural program on economic and behavioral factors affecting the success of several USDA food and nutrition programs, including: Supplemental Nutrition Assistance Program (SNAP, formerly called Food Stamps); Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); National School Lunch Program;

School Breakfast Program; Child and Adult Care Food Program; Summer Food Service Program; and After-School Snacks and Suppers. The goals of these competitive grant competitions were determined in close consultation with USDA Food and Nutrition Service (FNS) to maximize the probability that funded research contributed to the evaluation or implementation of FNS programs. The program produced 214 grants and cooperative agreements amounting to \$33.4 million across approximately 100 institutions nationwide. The program successfully brought outside expertise to bear on the efficiency, effectiveness and span of FNS programs. Moreover, this research explicitly considered USDA food and nutrition assistance programs in the context of other federal programs that serve many of the same people.

### **Competitive Grants in the Application of Behavioral Economics**

ERS has been a pioneer among federal agencies in funding research on the adoption of behavioral economic theory and concepts to improve federal programs. Between 2014 and 2016, ERS conducted an independent competition that established a Center for Behavioral and Experimental Agri-Environmental Policy Research, led by a consortium of the University of Delaware, Johns Hopkins University and Cornell University; conducted a competition along with FNS to establish a Center for Behavioral Economics and Healthy Food Choice Research, led by a partnership between Duke University and the University of North Carolina, Chapel Hill; and carried out a \$1 million competitive grants program, jointly with NIFA, for two projects on behavioral economics for agri-environmental programs. These programs complemented a series of cooperative research agreements with academic and other institutions on behavioral economic applications. They have been particularly successful in drawing economic expertise outside of traditional institutions to focus on USDA priorities.

### **Other Extramural Grants**

ERS has had successful extramural grant programs in many diverse areas, including food acquisition, nutrition and public programs, the economics of invasive species and markets for agricultural greenhouse gases. From 1998 to 2016, the agency has awarded small grants for more than 285 projects at over 100 educational and research institutions. ERS also builds unique collaborations that familiarize extramural researchers with valuable national data sets. Some researchers outside the agency may not otherwise be aware of the depth and breadth of the high-quality information that ERS curates. This is one critical way that ERS connects with the community.

### **Extramural Funding Issues**

In recent years, two issues have affected the extent and type of extramural funding that ERS provides. First, because inflation-adjusted appropriations to ERS are \$4 million less in 2017 than in 2010, both the absolute amount and the ratio of extramural to intramural research have gone down. Intramural research and statistical functions must take priority when operating funds are limited. Second, sometimes there are years in which the time period to hold a competitive grants

program is too short due to the arrival of appropriations late in the fiscal year, a result often following lengthy continuing budget resolutions. A lack of consistent support turns researchers away from USDA priorities.

### **A Principal Statistical Agency**

ERS is one of 13 agencies of the U.S. government designated by the Office of Management and Budget as Principal Statistical Agencies. ERS statistical and information products affect USDA policy at the highest levels, level the playing field for small and large participants in agriculturally related markets and are made available broadly to inform important decisions made by private food and agribusinesses, farmers and ranchers, farm households and rural communities.

The statistical function that ERS performs is an integral part of its own research program. Equally important is the fact that ERS data collection and construction of statistical indicators provide the input for applied analyses undertaken by academic researchers. The ERS program has long been designed to significantly add value to the worth of its statistics by making them available to researchers outside the agency. ERS was the first statistical agency to provide researchers outside the federal government secure remote access to farm and household data, ensuring survey respondents that strict confidentiality is maintained.

The following examples are among the many statistical activities conducted and economic and market indicators that ERS produces and maintains.

#### **Example: Farm Income and Farm Household Wealth**

The Agricultural Resources Management Survey (ARMS), planned and funded jointly by ERS and the National Agricultural Statistics Service (NASS) and enumerated annually by NASS, is unique among sectoral surveys. It collects economic, demographic and financial information on U.S. farms and ranches, connected to field-level production and animal management practices of subsets of these operations. ARMS also collects information on characteristics of households that operate surveyed farms and ranches. The resulting statistics provide the fulcrum for ERS' three-times-a-year releases of official farm income and wealth statistics. The Secretary of Agriculture is regularly briefed on farm income releases and on the factors contributing to specific estimates. Average farm income, distribution of farm income, farm-sector financial measures, farm household well-being and other measures together describe the status of the farming sector and influence decisions about farm safety-net provisions and other critical policies. ARMS data also are used to fulfill a congressional mandate to report cost-of-production estimates for corn, wheat, cotton, grain sorghum, barley, oats and dairy. Finally, farm income and value of production feed into the Commerce Department's statistics on overall national income, which form a basis for estimation of GDP. Between January 2014 and September 2017, researchers working on 64 academic research projects at 53 universities accessed detailed, confidential ARMS data over secure systems. A search of the *American Journal of Agricultural Economics* shows 101 peer-

reviewed research articles appearing in that journal between 2004 to 2017 referenced “ARMS data” on topics ranging from economics of sub-therapeutic antibiotic use to who benefits from farm subsidies.

### **Example: Food Acquisition and Purchasing Behavior**

ERS designed and implemented a National Household Food Acquisition and Purchase Survey (FoodAPS) to fill critical gaps that arose in the mid-2000s when the Agricultural Research Service discontinued its data collection on human food consumption and nutrition. USDA increasingly required research to inform policymaking on issues such as health and obesity, food insecurity and food and nutrition assistance policy. FoodAPS statistics document how, why and under what circumstances Americans purchased or otherwise acquired food for consumption at home and away from home, including foods acquired through food and nutrition assistance programs. The survey includes nationally representative data from 4,826 households. As of October 2017, nine peer-reviewed articles by external researchers using FoodAPS data have been published in respected journals. Ten extramural research projects organized by the National Bureau of Economic Research (NBER), with support from ERS and the Food and Nutrition Service, are underway. Fourteen cooperative research agreements exploiting FoodAPS data for the public good were awarded to faculty at 11 different universities. Dozens of independent research projects are underway using FoodAPS data obtained through a confidentiality-protected data enclave.

### **Example: Retail Food Price Forecast**

Each month ERS publishes a retail food price forecast that projects expected changes in U.S. retail food prices for the next 12 to 18 months. These forecasts are used by both private-sector and public-sector decision-makers to predict future costs and overall trends in the retail food market. In addition, ERS provides customized forecasts to USDA Food and Nutrition Service that allow that agency to make cost estimates for its WIC program and to monitor price changes that can impact its other assistance programs.

### **Example: Agricultural Productivity**

ERS estimates productivity growth in the U.S. farm sector from 1948 to 2015 and estimates the growth and relative levels of productivity across states from 1960 to 2004. Both multifactor productivity and relative productivity for specific inputs are available. The national productivity data also feed the intercountry productivity analysis that ERS conducts. Keeping the productivity trend current is a very complex task. It must account for changes in the mix, quality and quality-adjusted cost of multiple inputs to normalize the figures over time. With the rate of agricultural productivity growth trending downward, it is important to maintain these data at the national level. However, ERS has ceased the generation of state-level productivity measures to reduce costs as limited funds are available.

### **Example: Atlas of Rural and Small-Town America**

This interactive and periodically updated map draws on county-level demographic and economic data from across a number of official statistics sources, along with ERS-generated county typology codes. It is a heavily used internet product.

### **Example: Normalized Prices**

ERS annually calculates normalized prices, which smooth out the effects of short-run seasonal or cyclical variation for key agricultural inputs and outputs. This information is used throughout government to evaluate the benefits of projects affecting agriculture.

### **Example: Food Security**

ERS is the source for federal estimates of food security, using a survey methodology endorsed by the National Academy of Sciences that provides insight into households that lack consistent access to adequate food.

### **Other Statistical Examples**

ERS maintains many other data products, including those that inform various aspects of individual commodities' markets, agricultural trade, agricultural research funding, food consumption and nutrition, cost of food illnesses, food availability, major land uses and biotechnology. A full list of data products is available on the ERS website. As a USDA representative to the United Nations Statistical Commission, including its Global Strategy to Improve Agriculture and Rural Statistics, ERS actively works to improve the coordination and production of national statistics related to agriculture, food, natural resources and rural data across countries. Setting international standards ensures that the United States receives the same high-quality information from other countries as it provides to them.

### **Laws and Directives for Statistical Agencies**

Production and dissemination of the survey data and calculated measures that ERS independently provides fall under the requirements of several laws and statistical policy directives issued by the Office of Management and Budget's unit on Statistical and Science Policy. ERS is one of 13 federally designated statistical agencies and three statistical units (subcomponents of agencies) that are subject to provisions of the Paperwork Reduction Act, the Information Quality Act (impacting all research agencies) and, uniquely, to the Confidential Information Protection and Statistical Efficiency Act (CIPSEA) of 2002. These laws prescribe processes for survey review to assure minimum burden and nonredundancy among surveys; information resources management to protect integrity; and approaches to protecting survey information so that responses will not be exposed in ways that could lead to identification of respondents.

In addition, four statistical policy directives provide important guidelines for ERS and the other Principal Statistical Agencies. Statistical Policy Directive #1 in particular has implications for the structure as well as the functions of ERS. This directive, which is a codification of the National Academy of Sciences' *Principles and Practices for a Federal Statistical Agency*<sup>5</sup>, affirms the fundamental responsibilities of federal statistical agencies and recognized statistical units in the design, collection, processing, editing, compilation, analysis, release and dissemination of statistical information. It emphasizes the need for cabinet departments to facilitate the ability of statistical agencies to meet their responsibilities. Directive #1 is explicit in recognizing the need for public trust of federal statistics and the autonomy necessary for a statistical agency to be trusted. It states:

*“Federal statistical agencies and recognized statistical units must be able to conduct statistical activities autonomously when determining what information to collect and process, the physical security and information systems security employed to protect confidential data, which methods to apply in their estimation procedures and data analysis, when and how to store and disseminate their statistical products, and which staff to select to join their agencies. In order to maintain credibility with data providers and users as well as the public, Federal statistical agencies and recognized statistical units must seek to avoid even the appearance that agency design, collection, processing, editing, compilation, storage, analysis, release, and dissemination processes may be manipulated.”*

Having USDA's Research, Education and Economics mission area provide the organizational home for ERS helps ensure the objectivity of agency research and forestall inappropriate influence on research findings that might run counter to program agency preferences.

### **Leadership in Market Situation and Outlook**

Because ERS conducts high-quality research — intramural and extramural — and collects and compiles statistics for research and analysis, it is in a unique position to contribute to USDA's interagency market outlook programs.

ERS researchers and commodity analysts create and maintain databases and publicly release commodity market outlook reports. These commodity reports are widely used by farmers, ranchers, agribusiness, banks and investors. An important function they fulfill is assuring that all participants in the market, whether small or large, corporate or family-owned, contractees or contractors, have identical information on which to base decisions. Assuring information availability levels the business playing field in a sector that remains highly competitive.

A number of ERS situation and outlook programs have been curtailed or eliminated as the inflation-adjusted value of congressional appropriations to the agency has dropped. As resources have shrunk, ERS has focused on countries and commodities for which information makes markets work, and on important countries where information is hard to obtain. This has meant that the agency provides little outlook information on Europe, but focuses instead on China,

India, Brazil and other large, developing countries. ERS expertise on China, especially, remains critical to USDA. ERS global market expertise also is critical for USDA's trade negotiations and international market outlook.

ERS' research findings, commodity databases and forecast modeling capabilities provide the bulk of the resources needed for decision-making in the USDA's commodity and trade outlook programs. ERS works with the World Agricultural Outlook Board, the Foreign Agricultural Service, Farm Services Agency and other USDA agencies to produce monthly World Agricultural Supply, Demand Estimates (WASDE) reports. To produce the WASDE reports, ERS market analysis and data are combined with foreign intelligence, intelligence from USDA program operations, weather forecasts and commodity experts' judgment. The World Agricultural Outlook Board, staffed largely by ERS alumni, releases the WASDE reports, which provide comprehensive forecasts of supply and demand for major crops, both global and United States, and for U.S. livestock. WASDE reports that contain new or unanticipated information directly and often immediately affect commodity markets<sup>6</sup>. This makes their accuracy and quality vital, highlighting another large impact of ERS intramural programs.

Finally, ERS has the lead role in creating the annual USDA Baseline Projection of agricultural commodity supply, demand and prices, agricultural trade and aggregate indicators of the farm sector (such as farm income). The Baseline Projection, looking 10 years into the future, is released by the USDA Office of the Chief Economist prior to each year's USDA's Outlook Forum. It facilitates policy analysis by providing the baseline conditions under which new or proposed policies' economic effects can be measured. It is complex and sophisticated, and underscores the fundamental basis of ERS research — to inform USDA policymaking.

## **Continuous Program Review for Quality Control**

Consistent with the highest standards of public research agencies, ERS routinely solicits reviews of its programs from high-powered peers in the agricultural and applied economics community. Results of the reviews are taken seriously to prevent program stagnation and identify ways that programs might be improved. Each annual review covers a subset of ERS research topics, and is conducted by an external panel of experts in the topic area. In addition to a long-form narrative review, the panel scores the ERS research topic on a scale of 1 to 10, with 8 to 10 considered a rating of "Excellent." ERS has achieved ratings of "Excellent" for program reviews, 2015 to 2017, while gaining important lessons on how the agency can further innovate. The program components reviewed during the current five-year cycle are:

1. Food Access, Food Choices and Nutrition (FY15)
2. Climate, Resources and Technology (FY16)
3. Markets, Trade and International Agriculture (FY17)
4. Farm Structure and Income and Rural Prosperity (FY18)
5. Food Safety (FY19)



Because federal decision-makers are key customers of ERS data and analyses, the agency also regularly solicits the views of these officials on their needs and on the extent to which ERS is delivering useful, timely output. ERS also engages congressional staff members and supports education and policy analysis relevant to legislative requirements. For example, the summary of Farm Bill provisions that ERS produces is a valued resource for staffers and others involved in implementation.

Periodic review of the agency's data and statistics programs serves an additional function — maintaining ERS leadership in data management, access and use in research and program evaluations. In fact, a Deloitte Insights Report<sup>7</sup> calls out ERS as a public-sector success story in using data to improve resource decisions.

## Professional Citizenship

ERS has a substantial impact on agricultural and applied economics through the development of young professionals. The agency has a long-running, robust summer internship program that has introduced students, largely but not exclusively from the land-grant university system, to extensive data sets and new research topics. ERS gives its interns substantive assignments that require rigor and appropriate supervision. Often, an intern becomes a co-author on an ERS research report. Another frequent outcome is that a Ph.D. student intern chooses a dissertation topic that advances ERS research or takes advantage of a unique ERS data set. Some Ph.D. student interns receive support in the form of cooperative research agreements to pursue their research.

Under the relatively new Pathways Program, ERS provides students, recent graduates and Presidential management interns the ability to learn and grow while employed in a federal government position. ERS also has participated in the American Association for the Advancement of Science's Science & Technology Policy Fellowships Program, to great mutual benefit.

ERS staff are encouraged to act as peer reviewers of journal submissions and external research efforts. They have served on numerous committees of professional societies, international bodies like the Organisation for Economic Coordination and Development and the Food and Agriculture Organization of the United Nations. These experiences reinforce professionalism and serve as developmental experiences for the research staff and offer new opportunities for collaboration.

Finally, as the following quotes attest, ERS has been a supporter, champion and active participant in the activities of the Agricultural and Applied Economic Association (AAEA).

*“The health of ERS is vital to the health of the AAEA. Not only have ERS employees served in critical leadership roles for the AAEA, ERS generously helps support mentorship and professional development opportunities for early career professionals.”*

— Jayson Lusk, Distinguished Professor and Head of Department of Agricultural Economics, Purdue University, and Past President of AAEA

*“Many key AAEA initiatives owe a great deal of their success to the support and participation of ERS staff and leadership. ERS's role in the AAEA is a significant vehicle for government-academic interactions that leverage both institutions' resources.”*

— Jill McCluskey, Distinguished Professor, Washington State University, Member of National Research Council's Board on Agriculture and Natural Resources, and Past President of AAEA

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## Endnotes

<sup>1</sup> National Academies of Sciences, Engineering, and Medicine. 2017. The Value of Social, Behavioral, and Economic Sciences to National Priorities: A Report for the National Science Foundation. Washington, DC: The National Academies Press. <https://doi.org/10.17226/24790>

<sup>2</sup> Economic Research Service Annual Report, FY2016 at <https://www.ers.usda.gov/about-ers/plans-and-accomplishments/ers-annual-report-fy-2016/>

<sup>3</sup> Rankings are by Research Papers in Economics, based on multiple criteria including citations and impact rating. (<https://ideas.repec.org/top/top.inst.all.html>)

<sup>4</sup> Shumway, C. Richard, Barbara M. Fraumeni, Lilyan E. Fulginiti, Jon D. Samuels, and Spiro E. Stefanou (2016) U.S. Agricultural Productivity: A Review of USDA Economic Research Service Methods, Appl. Econ. Perspect. Pol. 38 (1): 1-29.

<sup>5</sup> National Academies of Sciences, Engineering, and Medicine. (2017). Principles and Practices for a Federal Statistical Agency, Sixth Edition. Washington, DC: The National Academies Press. <https://doi.org/10.17226/24810>.

<sup>6</sup> Adjemian, Michael K. (2012) Quantifying the WASDE Announcement Effect. American Journal of Agricultural Economics, 94(1): 238-256, and Isengildina-Massa, Olga, Scott H. Irwin, Darrel L. Good and Jennifer K. Gomez (2007) The Impact of Situation and Outlook Information in Corn and Soybean Futures Markets: Evidence from WASDE Reports. Journal of Agricultural and Applied Economics, 40(1): 89-103.

<sup>7</sup> Kelkar, Mahesh, Peter Viechnicki, Sean Conlin, Rachel Frey and Frank Strickland. Data Driven Decision Making in Government. A Report of Deloitte Insights, September 26, 2016. <https://dupress.deloitte.com/dup-us-en/industry/public-sector/data-driven-decision-making-in-government.html>