

**Statement by  
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March 18, 2016**

Chairman Conaway, Ranking Member Peterson, and distinguished members of the House Agriculture Committee, I am pleased to appear before you to provide an overview of the activities of the Research, Education, and Economics (REE) mission area of the United States Department of Agriculture (USDA), highlight some of our recent success, and share some insight on the priorities for the coming years.

I am accompanied by the leaders of our four agencies: Dr. Chavonda Jacobs-Young, Administrator of the Agricultural Research Service (ARS), Dr. Mary Bohman, Administrator of the Economic Research Service (ERS), Mr. Joseph Reilly, Administrator of the National Agricultural Statistics Service (NASS), and Dr. Sonny Ramaswamy, Director of the National Institute of Food and Agriculture (NIFA).

The United States and the world are facing critical problems and opportunities. Global population is expected to reach nine billion people by 2050, an increase of almost two billion people in about 34 years. At the same time we are seeing the impacts of climate change, impacts that will only get worse. Investments in research are a critical factor in meeting these and other challenges and opportunities. REE's work is based on the premise that the federal government has a role in advancing scientific knowledge to promote our Nation's social and economic well-being, and the agencies do so by investing in areas in which for-profit industry does not invest. The REE mission area agencies support the critical research our country needs to keep our food supply safe, secure, and abundant, ensure farm profitability, improve nutrition and food safety for lifelong health, reduce pollution and improve the environment through climate friendly

practices, safeguard sustainable use of natural resources, including an abundant and safe water supply, and address our nation's energy needs. Underinvestment or the absence of investments in food and agricultural sciences diminishes the needed foundational knowledge-base and impacts our Nation's global preeminence and economic well-being, and may put us at a competitive disadvantage with other nations, such as China, which is making significant increases in their investment in public sector research. While the private sector's commitment to agricultural research in the United States remains strong, many of the most important agricultural research companies are large international corporations that invest and outsource significant research dollars overseas, and China, India, and Brazil have begun making large public investments in agricultural research. Although private industry will play an important role, many of the challenges are in the public domain, and the waning public investment in agricultural research in the United States contributes significantly to the risk of losing its international leadership in agriculture.

The following are examples of the results of USDA research. Take for example the efforts of ARS, which conducts research to develop and transfer solutions to agricultural problems of high national priority to ensure high-quality, safe food, and other agricultural products; assess the nutritional needs of Americans; sustain a competitive agricultural economy; enhance the natural resource base and the environment; and provide economic opportunities for rural citizens, communities, and society as a whole.

Since FY 2009, ARS scientists have had 391 patents issued and were responsible for over 31,224 scientific publications. Furthermore ARS scientists developed and transferred to industry an effective vaccine against the highly pathogenic avian influenza (HPAI) virus strains that killed more than 45 million chickens and turkeys in the United States during 2015. ARS

scientists also developed and licensed the world's first molecular foot-and-mouth disease (FMD) vaccine for cattle, the most significant scientific accomplishment in FMD vaccine development in the past 50 years and the first FMD vaccine that can be manufactured in the United States. On the plant side, ARS scientists significantly advanced methods to detect and control the Huanglongbing (citrus greening) disease by increasing reliability of the standard assay tests, training dogs to detect greening and canker (currently the only detection method that is effective prior to symptom development), and evaluated promising bactericidal compounds that reduce the level of disease and improve tree vigor in field trials. Crop and animal protection is a key research investment in ARS totaling \$287.6 million in fiscal year 2016.

ARS maintains one of the world's oldest and largest plant genetic resource collections at 19 locations situated around the United States. These gene banks, which hold materials from both cultivated plants and their wild relatives, presently safeguard 218 plant families, 2,378 genera, 14,851 species, and more than 569,000 accessions. During the last 5 years, the ARS gene banks distributed more than 1 million samples to researchers and breeders, most of who lived in the United States. In addition, in 2014, ARS plant breeders and researchers developed and released 398 new plant varieties and enhanced germplasm lines that are part of an effort to help create new markets and enhance economic opportunities for rural America.

An example of the use of such a treasure is seen in the battle against wheat stem rust strain Ug99, which threatens wheat production worldwide. ARS scientists used a gene derived from a wild wheatgrass species to develop a new line highly effective at resisting Ug99 wheat stem rust that will help wheat breeders throughout the world develop more durable varieties for production. ARS invested \$51.2 million in preserving plant and animal genetic resources in fiscal year 2016.

Salmonella and Campylobacter are the most commonly reported bacterial pathogens causing foodborne illness in the United States. ARS scientists developed a novel probiotic method targeting these bacteria in poultry which has been licensed and developed by a start-up company, now marketed in 16 countries and dosing approximately 300 million birds. On the nutrition side, ARS scientists discovered that flour made from chardonnay grape seeds (a waste byproduct from wine making) prevented increases in weight gain in hamsters fed a high-fat diet. ARS invested \$198.7 million in food safety and nutrition research in fiscal year 2016.

In the same vein, NIFA measures its success through the impacts of its grants on the public good. Through the integration of research, education, and extension, NIFA ensures innovative solutions to problems in agriculture, food, the environment, and communities go beyond the laboratory, into the classroom, and to people who can put the knowledge into practice. Scientific advances resulting from NIFA-funded research, education, and extension — more than \$9.5 billion from fiscal year 2009 through 2015 — enhance the competitiveness of American agriculture, ensure the safety of the nation's food supply, improve the nutrition and health of the populace, sustain the environment and natural resources, and bolster the U.S. economy.

For example, through NIFA funding, the Triticiceae coordinated agricultural project (T-CAP), and its predecessor Wheat and Barley CAPs, focused on improving wheat and barley for changing environments. Like many of NIFA's CAPs, the T-CAP bridges the gap across the academic research, industry, and farming communities in order to produce higher yielding crops and support sustainable farming. The more than 100 commercial varieties developed through the T-CAP and its predecessor CAPs have a \$1.8 billion production value. The Wheat, Barley, and T-CAPs have trained more than 100 students, preparing them to fill some of the projected annual

openings of 57,900 jobs in agriculture-related fields between 2015 and 2020. The T-CAP also has had a positive impact in fostering international collaborations.

Peanuts are the 12th most valuable cash crop in the U.S., and allergies to peanuts are among the most severe of all food allergies, affecting some 2.8 million people in the U.S., including 400,000 school-aged children. Under an Agriculture and Food Research Initiative NIFA grant, North Carolina Agricultural and Technical State University (NC A&T) scientists discovered a way to remove up to 98 percent of the allergens. The process does not affect flavor, and treated peanuts can be eaten whole, in pieces, or as flour in various products. NC A&T officials expect hypoallergenic peanut products to be available commercially soon. Finally, as part of NIFA's commitment to local and global food supply and security, the University of Georgia horticulturists received NIFA grants to develop several varieties of blueberries that are specialized as early- and late-season crops, as well as larger berries at a higher yield. As a result, blueberry production has increased from 3,500 acres to more than 20,000 acres in recent years.

These are just a few examples of results from two of the largest REE mission area agencies. Despite their relatively smaller size, the remaining two REE agencies — NASS and ERS — provide an essential service that policymakers, regulators, markets, and academics rely on every day. As principal Federal statistical agencies both NASS and ERS provide data relevant to policy issues, maintain credibility among data users, maintain the trust and confidentiality of data providers, and maintain independence from political and other external influence.

NASS's mission is to provide timely, accurate, and useful official statistics in service to U.S. agriculture. NASS achieves this through two separate appropriated program areas: the Agricultural Estimates program and the Census of Agriculture and its follow-on studies. The

Agriculture Estimates program issues over 400 reports annually, of which 46 are Principal Federal Economic Indicators, providing US, regional, and State estimates on a wide range of crop and livestock commodities, in addition to estimates of environmental issues, economics, and demographics. With the implementation of The Agricultural Act of 2014, the Farm Service Agency relies on the NASS County Estimates to enable administration of the Agriculture Risk Coverage (ARC) Program and the Price Loss Coverage (PLC) Program. During calendar year 2016, NASS published special reports on Organics, and the Census of Horticulture and Tenure Ownership and Transition of Agricultural Land (TOTAL). As the only source of detailed information on agricultural land ownership characteristics and economic data, TOTAL provided important statistics to government, academia, the farming industry, and others regarding agricultural land ownership for planning, policymaking, research, and market analysis. Results from the 2014 TOTAL Survey showed that 91.5 million acres are expected to change ownership in the next 5 years.

The Economic Research Service also reaches far beyond the borders of USDA. The mission of ERS is to inform and enhance public and private decision making on economic and policy issues related to agriculture, food, the environment, and rural development. Although ERS research programs are aimed at the information needs of policymakers, its information and analysis are also used by the food and agricultural sector, academic researchers, trade associations, public interest groups, the media, and the general public. ERS studies are widely recognized in the research community for their credibility, timeliness, and use of cutting edge data, models, and methods.

For example, ERS carefully tracks and projects the state of the farm economy to better understand the financial condition of agriculture. ERS data show how resilient American

farmers have been and how well they managed their savings and expenses during the recession. These core statistical indicators can guide policymakers, lenders, commodity organizations, farmers, and others interested in the financial status of farms. ERS also has determined the location and derived the characteristics of areas with low food access – places where grocery stores do not exist or are not easy to reach – and these ERS research tools help national, State, and local governments target food access investments so that Americans with low access will have better choices and better health in the future. ERS’s research on trade agreements examines the potential impacts of these agreements on food and agricultural production and trade and shows the implications for the health of U.S. agriculture. Finally, ERS research demonstrates the benefits of agricultural research and the importance of public agriculture research spending for continued productivity growth. ERS research finds that every dollar invested in public agricultural research generates at least ten times that amount in benefits to society.

Mr. Chairman, I would like to round out my discussion with a word on current initiatives and a look forward at agricultural science in the coming years. The REE agencies continue to meet head on the existing and emerging challenges of the agricultural community in innovative ways through consolidations and partnerships that increase flexibility and maintain critical mass needed for research on pressing problems. Here are three such examples.

In the last few years, the issue of antimicrobial resistance (AMR) has emerged as a serious health threat to both animals and humans. The action plan for combatting AMR takes a voluntary, comprehensive, systems approach to surveillance, research and development, and outreach activities. In implementing this action plan, USDA intends to provide researchers, producers, and consumers science-based, quantitative information about drug use and resistance in food animals and their relationship to livestock management practices.

Over the next decade we face diverse challenges stemming from a changing climate. In order to maintain the viability of their farms and ranches and respond to the growing demand for food around the world, U.S. producers have to prepare for, and mitigate and adapt to the impacts of climate change and the severe weather. REE continues to develop innovative climate solutions and tools that can be applied on the farm. ARS researchers will: (1) identify and evaluate management practices that maximize the genetic potential to achieve optimal yield and quality with climate change; (2) advance the understating of climate change effects on pests and beneficial insects; (3) develop the means to reduce vulnerability to water variability; and (4) determine the relative degree of production sensitivity among different animal and cropping systems to projected changes of climate.. By working with our network of regional Climate Hubs, our research can be disseminated to meet regional conditions and help producers implement climate-informed management practices.

The Pollinator Health Initiative will focus on the decline of honey bees and other pollinators. The continued loss of commercial honey bee colonies stands to have profound implications throughout the food and agriculture enterprise. In collaboration with the U.S. Environmental Protection Agency, university scientists, and private sector partners, the Pollinator Health Initiative will make advances in our understanding of the complex factors contributing to the decline — factors like poor bee nutrition, loss of forage lands, parasites, pathogens, and exposure to pesticides — and provide a path forward to arrest continued pollinator losses.

Of course all of us are aware of the increase in demands on our water resources and areas that have and continue to experience droughts. REE is meeting the challenge of providing a sufficient level of safe water for agricultural purposes through investments in both ARS and



NIFA, including additional funding in ARS for the CA area drought, for the Great Basin and for the use of non-traditional water.

REE also has led the charge to better coordinate global agricultural research efforts. In 2012, REE advocated for, and was instrumental in forming, the establishment of the G20 Meeting of Agricultural Chief Scientists (MACS). Thus far, we have met three times. MACS seeks to promote collaboration among the major public funders of agricultural research. The MACS forum also has proven instrumental in identifying key global challenges, like the development of animal disease vaccines, which have a significant impact on global food security and would benefit from collective solutions. Identifying key global challenges can be particularly helpful to the developing world as key research is pursued among the G20.

Finally, I want to highlight the critical importance of competitive peer-reviewed research. REE is proposing to double the funding for the Department's flagship Agriculture Food and Research Initiative (AFRI) to the authorized level of \$700 million. While a portion (\$25 million) of the increase is included in the discretionary request that we have submitted, the remainder will be proposed through authorizing legislation.

Mr. Chairman although REE has made significant strides, there is still much to be accomplished. Our storied legacy of discovery, innovation, and international leadership in agricultural research, education and economics was achieved through a steadfast approach to our overall goals. Moving forward, sufficient investments in man-power and funding will be a challenge we must all rise to meet. I look forward to redoubling our efforts together in the coming year. Thank you.