AGRICULTURAL RESEARCH SERVICE

Statement of Dr. Edward B. Knipling, Administrator

Before the Subcommittee on Agriculture, Rural Development,

Food and Drug Administration, and Related Agencies

Mr. Chairman and members of the Subcommittee, I appreciate this opportunity to present the Agricultural Research Service's (ARS) budget recommendations for 2014. The President's 2014 budget request for ARS' research programs is $1,124,003,000.

Under its Salaries and Expenses account, ARS' 2014 budget request proposes $148.2 million in new and expanded initiatives consisting in part of $40 million for research related to earth sciences, and $37 million to collect, manage, analyze, and share huge quantities of research data across the agency's entire food and agriculture research spectrum. These initiatives respond to the Office of Science and Technology Policy's challenge and priority to develop the research tools and infrastructure needed to handle the "big data" revolution and accelerate the pace of discovery to improve crop and animal production and health, food safety and security, human nutrition, bioenergy, agricultural sustainability, and adapt to the effects of climate change. The remaining component of the increase request are $71.2 million in program initiatives proposed in the 2013 budget request which were not enacted. In addition to the new initiatives, the request includes $6.4 million for pay costs. ARS' 2014 budget also includes a $125.2 million reduction in ongoing research programs and a reallocation of those resources to help finance the new initiatives.

Under its Buildings and Facilities account, ARS' 2014 budget request proposes $155 million to fully fund a new and modernized poultry biocontainment research facility in Athens, Georgia.

Additional information about the components of ARS' 2014 budget are as follows:

Initiatives for Research Programs ($148.2 million)

New Products/Product Quality/Value Added -- $5 million

Bioenergy

The price volatility of fuel and feedstock markets is threatening the viability of grain-based ethanol and oilseed-based biodiesel biorefineries. Some biorefineries have been forced to close their facilities and lay off employees. With the proposed increase, ARS will improve the viability of biorefineries by providing alternative biomass feedstocks and higher value biorefinery products and co-products.

Livestock Production -- $12.6 million

Livestock Production/Health

Increasing world food demands are potential threats to global security. This initiative will enable ARS to apply and enhance its' "big data" expertise and infrastructure, to utilize animal genomics to improve animal productivity and feed efficiency. ARS will also conduct research to reduce antimicrobial resistance in livestock. In addition, ARS will develop integrated production systems that incorporate enhanced germplasm and management strategies to improve livestock, poultry, and aquaculture product quality.

Crop Production -- $15.8 million

Agricultural Sustainability

Much U.S. agricultural production has been predicated on the availability of plentiful water and plant nutrients, and a relatively stable climate. Increasing competition for water and the high costs of plant nutrients along with an expected increase in climate extremes of temperature and precipitation require agricultural production systems to produce under less than ideal conditions. This initiative will enhance ARS efforts to develop integrated programs to increase the resiliency of production systems, such as by creating new crop varieties that use less water and nutrients, and providing more efficient fertilizer technologies.

Floral and Nursery Crops

Floral and nursery plants constitute the third largest farm production value in the U.S. It is a multi-billion dollar segment of the economy at wholesale, and about 15 percent of total U.S. crop receipts. Yet its profitability, sustainability, and economic vitality is threatened by new pests and diseases, and inefficient production practices. This initiative will enhance ARS efforts to develop improved pest/disease control strategies, refine production system practices, and enhance environmental and resource management strategies to ensure U.S. farmers remain competitive in a global market.

Maize, Other Cereals, and Perennial Grasses

ARS researchers and university collaborators are developing new crop breeding approaches that exploit genome sequence data. This progress must be accelerated by leveraging current "big data" approaches to utilize complex and voluminous information. This initiative will enable ARS to provide better data analysis to accelerate yields of maize, small grains, and perennial grasses grown for food, feed, and bioenergy.

U.S. National Plant Germplasm System

The U.S. National Plant Germplasm System's genebanks contain the sources of resistance to biotic and abiotic stresses, and new genes to improve the quantity and quality of our crops. To ensure that these resources are available for research and breeding, ARS must continue to acquire and conserve the germplasm that contain them; develop new screening methods for identifying favorable traits; distribute germplasm when it is needed; and safeguard these collections for future generations.

Food Safety -- $15.7 million
Food Safety Intervention Technologies

Food safety remains an essential priority in the U.S. and around the world. Foodborne outbreaks are a major source of morbidity, mortality, and economic devastation. The Centers for Disease Control and Prevention (CDC) estimate that the full cost burden to be $152 billion per year. This initiative will enable ARS to develop new technologies for identifying and characterizing microbial pathogen strain differences, virulence, pathogenicity mechanisms, and host-pathogen

interactions for fresh produce and animal-related foodborne pathogens. ARS will also evaluate the role of alternatives to antibiotics, management practices on the prevalence of antimicrobial resistance, and emerging pathogens in food animals.

Detection Technologies for Crops at High Risk of Infection

Grain crops such as corn and cotton seed, ground nuts (peanuts), and tree nuts (pistachios, almonds) are subject to severe pre- and postharvest contamination by mycotoxins. A CDC report released in January 2013 reconfirmed that produce commodities (e.g., vegetables, fruits, and nuts) are the largest source of foodborne illness in the U.S. This initiative will enable ARS to develop, for implementation by regulatory agencies, technologies that will identify and characterize foodborne contaminants, both toxins and pathogens, in high risk produce commodities.

Livestock Protection -- $8.4 million

Antibiotics in Farm Animals

There is increasing concern that some bacterial pathogen strains resistant to antibiotics used for human health may be traceable to the sub-therapeutic use of antibiotics in animal feed as growth promoters. This initiative will enhance ARS efforts to develop alternatives to antibiotics to prevent/control animal diseases, reduce antibiotic resistance in human pathogens, and enhance livestock production.

Veterinary Insect Genomics Information Center

Such a Center is needed to assemble "big data" sets that contain the knowledge about the relationships and biology of many kinds of insect pests that affect both man and animal, in order to address problems related to climate change, invasive species, and production risks. This initiative will enable ARS to establish the Center which will focus on biting insects and disease vectors such as mosquitoes, flies, ticks, gnats, lice, fleas, etc. This research will involve medical and other partners at Walter Reed Army Institute of Research, the CDC, and the Smithsonian.

Crop Protection -- $16.2 million

Soil Microbial Ecology

Management of plant pathogenic microbes and nematodes that live in the soil is critical to the production of agronomic and horticultural crops. For more than 50 years, most diseases caused by these pathogens have been managed primarily through fumigation of soil with chemical biocides, such as methyl bromide. The use of methyl bromide for soil fumigation, however, has been banned (with limited exceptions), and other fumigants and synthetic pesticides are under greater regulatory scrutiny. With the reduced use of methyl bromide and the increased use of replacement alternatives, new soilborne disease problems have emerged. This initiative will enable ARS to enhance plant health and productivity by providing additional management tools for soilborne plant pathogenic microbes and nematodes.

Invasive Pests

Invasive weeds, arthropods, and plant pathogens threaten agricultural production and natural ecosystems at an ever increasing rate. New species are introduced and distributed widely as world trade and international travel expand. Economic losses of agricultural crops and natural ecosystems due to invasive pests are in the tens of billions of dollars. This initiative will enable ARS to develop integrated pest management approaches to contain and control newly introduced species as well as reduce or replace chemical-based strategies for controlling established pest species.

Plant Disease Management

Plant diseases cause billions of dollars in economic losses each year to agriculture, landscape, and forests. These diseases reduce yields, lower product quality or shelf life, decrease aesthetic or nutritional value, and sometimes contaminate food and feed with toxic compounds. This initiative will enhance ARS efforts to improve the control of diseases attacking small fruit and nursery crops, potatoes, and wheat by developing resistant varieties and new disease management techniques. Also, ARS will enhance fungal disease protection in beans, sunflowers, and other crops.

Insect Damage Reduction

Insect and related arthropod pests, and the diseases they carry, threaten our food, fiber, and natural ecosystems as well as the health of the pollinators for our Nation's crops. This initiative will enable ARS to develop "EntBase" to assemble, analyze, and exploit insect and other arthropod genomic data for controlling pests and protecting beneficial insects such as bees. "EntBase" will also support the Veterinary Insect Genomics Information Center.

Human Nutrition -- $13.9 million

Scientific Base for USDA's Food Assistance Programs

ARS conducts the only nationally representative survey of human food intake in the Nation, as part of the National Health and Nutrition Examination Survey (NHANES), in a longstanding partnership with the HHS National Center for Health Statistics. ARS is responsible for the dietary survey interviews and the processing of the data, which are essential to understanding food choices, and the nutritional and health status of individuals participating in SNAP, WIC, and child nutrition programs. The data is also used as the evidence base to set *Dietary Reference Intake (DRI)* values, and update the *Dietary Guidelines for Americans*. This initiative will enable ARS to strengthen the survey, the food composition database, and the DRI in support of USDA's food assistance programs and dietary guidance for health.

Human Nutrition Monitoring/Surveillance

Obesity is at a record level in the United States. Heart disease remains the number one cause of death, diabetes rates are increasing, and cancer incidence remains high. All of these conditions are linked in part to obesity and other consequences of poor nutrition. This initiative will enable ARS to strengthen its nutrition monitoring/surveillance programs and develop new tools which link USDA's food composition and consumption data to Federal nutrition policy and implementation guidance such as "MyPlate."

Environmental Stewardship -- $53.4 million

Natural Resources Enhancement

In agricultural ecosystems, physical and biological processes -- such as the cycling of carbon, water, and nutrients -- are linked with social and economic processes. To achieve sustainability, it is essential that we understand how these processes interact, and their impacts on the environment. Agricultural research must identify these linkages so that progress in one agricultural sector does not inadvertently create or exacerbate problems in another. This initiative will enhance ARS efforts to improve our understanding of how key agricultural system components interact, which in turn will lead to better agricultural production systems, adapted to changing climates and weather extremes.

Water and Soil Quality Effects of USDA Conservation Programs

Quantifying the actual benefits rather than roughly estimating the benefits of USDA conservation efforts is needed. Measured benefits will help set realistic timelines for water quality improvement goals (e.g., in the Mississippi River, the Gulf of Mexico, and the Chesapeake Bay) as well as soil quality goals. This initiative will enable ARS to develop more cost effective and less invasive methods to quantify water and soil quality goals of USDA conservation programs.

Climate Change

The impacts of climate variability and change on agriculture are becoming more acute, threatening yields, economic viability, and environmental quality needed for sustained production of crops and ecosystem services. This initiative will enhance ARS efforts to reduce agriculture's vulnerability to climate change by improving irrigation and other water use efficiency practices, and developing more climate resilient crops.

Long-Term Agro-ecosystem Research (LTAR)

This national network of landscape scale agro-ecosystem research sites will aid our understanding of the Nation's capacity to provide agricultural and other ecosystem-related goods and services under changing environmental conditions and changing demands on natural resources. The LTAR network includes 10 existing crop production and range research sites, some of which have data records back to 1912. This initiative will enable new research

undertaken at these sites to be coordinated to enable data comparability to understand climate variability effects and trends across a range of production zones. LTAR will interact and collaborate with other national ecological research networks, such as the National Science Foundation's already operational Long Term Ecological Research network (LTER), the National Ecological Observatory Network (NEON), and the Forest Service's network of Experimental Forests and Ranges.

Earth Observation and Environmental Data Activities

Understanding and addressing global problems -- such as, population growth, climate change, decreasing natural resources, and loss of productive farm land -- depends upon the availability of high quality, reliable, easily accessible earth observation data. A coordinated approach leveraging existing systems and building integrative capabilities is needed. This initiative will enable ARS in partnership with other USDA agencies to develop software tools to collect, organize, manage, retrieve, and preserve datasets, and use the USDA enterprise information resource hub to support and analyze research on the LTAR network, and other platforms.

Library and Information Services -- $7.2 million

NAL Data Management

Information is the fundamental currency of scientific research, and yet researchers' data and findings too often remain stored in isolation. The increasingly interdisciplinary nature of agricultural problems requires pulling that information together in a common coordinated informatics structure accessible to other researchers and users. This initiative will enable ARS to provide a coordinated informatics structure which will enable researchers to access, compare, and use datasets, research findings, scientific collections, and scholarly publications across research sites and disciplines.

Proposed Pay Costs ($6.4 million)

In its 2014 budget, ARS is requesting $6.4 million for employee pay costs. Funding a pay cost increase in Federal salaries after a three year pay freeze is critical for recruiting and retaining top level scientists and staff, conducting viable research programs, and carrying out ARS' mission.

Proposed Research Program Reductions and Reallocations ($125.2 million)

ARS' 2014 budget includes $125.2 million in program reductions and a reallocation of those resources, consisting of $93.2 million from ongoing base research projects and $32.1 million from extramural research projects. The resulting savings will be used to finance the agency's proposed high priority research initiatives and include the closure of one ARS location and five laboratories, and the consolidation of those resources with other existing ARS laboratories and locations.

Proposed Initiative for Buildings & Facilities ($155 million)

ARS proposes $155 million for the planning, design, and construction of a modernized and replacement facility for ARS' Southeast Poultry Research Laboratory (SEPRL) in Athens, Georgia which was constructed more than 30 years ago. A review of the agency's Capital Asset Requirements, requested by Congress and the Secretary of Agriculture, was completed last year. The review highlighted ARS' aging infrastructure and recommended modernization of selected facilities. The highest priority need is replacement of the Georgia laboratory which is the major facility in USDA for conducting research on exotic and emerging poultry diseases, including Avian Influenza and velogenic Newcastle disease. This new facility is crucial in continued efforts to protect our poultry industries from new and emerging influenza viruses and emerging/exotic poultry diseases which threaten the Nation's poultry industry and potentially U.S. public health. The new facility will provide state-of-the-art laboratories and necessary biocontainment capabilities needed to continue this critical research.

Closing

ARS' 2014 budget proposes to enhance USDA's existing research capacities, and build extensive, new partnerships and networks with other Federal, State, and local agencies, universities, and international scientists to address the enormous challenges of sustainably boosting food production and other agriculture-based economic developments in the face of changing climates and massive anticipated world population growth and food demands. Initial

investments will be made to establish the infrastructure needed to take advantage of the "big data" revolution. This is the key to accelerating the pace of discovery and the application of those discoveries to improve agricultural production, food safety and security, human nutrition, agricultural sustainability, and adaptation to climate change.

Mr. Chairman, this concludes my statement of ARS' budget recommendations for 2014. I will be happy to answer any questions that the Subcommittee may have.