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NATIONAL INSTITUTE OF FOOD AND AGRICULTURE

Statement of Dr. Sonny Ramaswamy, Director
Before the Subcommittee on Agriculture, Rural Development,
Food and Drug Administration, and Related Agencies

Mr. Chairman and Members of the Subcommittee, I appreciate the opportunity to present the President's 2014 budget for the National Institute of Food and Agriculture (NIFA), one of the four agencies in the Research, Education, and Economics (REE) mission area of the United States Department of Agriculture (USDA).

NIFA works in partnership with the land grant university system, other colleges and universities, and public and private research and education organizations to support exemplary research, education, and extension that address many national issues from agricultural production, nutrition, and food safety to energy independence and the sustainability of our natural resources. These partnerships result in a breadth of expertise that can quickly and efficiently deliver critical knowledge through innovative systems.

NIFA Institutes

NIFA is organized into four institutes that administer Research, Education and Extension programs in the areas of: Institute of Food Production and Sustainability, Institute of Bioenergy, Climate, and Environment, Institute of Food Safety and Nutrition and Institute of Youth, Family and Community. NIFA Institutes continue to fund outcomes-driven programs, which address science priorities that will maintain the global preeminence of United States agriculture. The Institutes provide leadership and administer Federal assistance programs that bring together experts in various disciplines and functions to form multidisciplinary, outcomes-based teams on projects that have a global presence in a wide array of agricultural and related disciplines. The programs also are reflective of and congruent with, Farm Bill priorities and the investment in

research and development is providing transformational solutions to the Nation's practical challenges, creating jobs, and promoting local economies.

For example, in support of plant health and production and plant products, a 21-State Coordinated Agricultural Project (CAP) led by the University of California-Davis is improving U.S. wheat and barley. The project's 200 scientists, students, and technical staff generated an integrated network of public wheat and barley breeding programs, and have accelerated the development of improved varieties for the Nations' different cereal-growing regions. U.S. wheat and barley breeders released 14 new varieties, 12 new improved germplasms; 2 mapping populations, and characterized tens of thousands of breeding lines by using molecular markers.

In support of animal health and production and animal products, University of Missouri researchers are developing effective biofilters for cattle operations to filter and break down compounds that create pungent odors. A computer model allows producers to inexpensively estimate the extent of emission problems based on operational information. The development of technologies that promote environmentally safe and sound practices in concentrated animal feeding operations allows rural regions in northwest Missouri and surrounding areas to benefit from this source of economic opportunity without sacrificing air quality.

In 2001-2002, an outbreak of low pathogenic avian influenza in the U.S. resulted in the loss of over 4.5 million chickens and turkeys with a market value of about $125 million. In support of this food safety, nutrition, and health priority, the University of Arkansas and an international, multidisciplinary research team developed an integrated biosensor system for rapid screening of avian influenza in poultry. The sensor provides an urgently needed, rapid, sensitive, and effective detection capability for controlling the spread of avian influenza.

In Alabama, scientists are supporting the agriculture systems and making technology a priority. Auburn University, Alabama A&M University, and Tuskegee University researchers demonstrated an estimated 10 percent reduction in applied nutrients and pesticides when Alabama farmers adopted modern precision agriculture tools. The reduction led to enhancing environmental stewardship at the farm level while providing savings to farmers. In 2011, State farmers saved over $22 million on inputs through the adoption of guidance systems, variable-rate technology and automatic section controls.

Proposal

The NIFA 2014 budget proposal for discretionary funding is $1.29 billion. In particular, NIFA's budget includes increases for the Agriculture and Food Research Initiative and sustainable agricultural production practices, maintains capacity funding, and continues support of minority-serving programs, consolidates pest management programs, and expands support for extension and other programs.

In addition, as part of a Presidential Initiative to consolidate Federal Science, Technology, Engineering, and Mathematics (STEM) programs to use existing resources more effectively and in a more streamlined manner, the 2014 budget proposal transfers six NIFA STEM programs to the National Science Foundation (NSF) and Department of Education.

The 2014 budget request aligns funding and performance objectives with USDA strategic goals and the REE Action Plan. NIFA defines distinct performance criteria, including strategic objectives and key outcomes, with identified annual targets. As part of an integrated budget and performance process, NIFA conducts periodic portfolio reviews by external experts.

Agriculture and Food Research Initiative (AFRI)

The President's 2014 budget proposes $383 million for AFRI. AFRI is NIFA's core competitive grants program for research, education, and extension. The program provides funding for projects that address critical issues in U.S. agriculture in the areas of (1) agricultural and food production and security; (2) foundational science; (3) food, agricultural, natural resources, and human sciences education and literacy initiative; (4) agricultural production and climate variability; (5) water and water resources; (6) sustainable bioenergy; (7) nutrition and health; and (8) food safety.

Agricultural and Food Production and Security: In 2014, programs will address pressing issues in food production that contribute to national and global food security while helping America promote sustainable agricultural production and biotechnology exports. Funding will support projects to improve the understanding of existing and new genomic information, classical breeding to develop new and improved animal breeds, and crop cultivars for increased food production and quality. Efforts will target activities that address the programs of U.S. agriculture, create mutual benefits domestically and abroad, and allow new opportunities for inter-departmental initiatives as appropriate. In addition, it will address detection, diagnostics,

prevention, and potential impacts of new and emerging weeds, diseases, arthropods, and other pests in crop and livestock production systems.

A CAP award led by the University of Nebraska is helping to decrease the number of cases of shiga-toxigenic *Escherichia coli* (STEC) illness through coordinated and integrated research, education and outreach activities. Over 50 researchers and 11 collaborating institutions across the U.S. are targeting the reduction of the seven most important U.S. STEC types in beef.

Agricultural Production and Climate Variability: AFRI will support activities on adaptive management and mitigation potentials of agricultural and natural resource systems to address climate variables such as precipitation and temperature, and their impacts as a result of violent weather extremes, floods, or persistent droughts. Efforts will help farmers, ranchers, forest owners, and rural communities adapt to climate variation, reduce greenhouse gas emissions, and increase carbon sequestration.

Under this challenge area, AFRI supports a Corn CAP with a consortium that includes Iowa State University, Lincoln University (Missouri), Michigan State University, Ohio State University, Purdue University (Indiana), South Dakota State University, University of Illinois, University of Minnesota, University of Missouri, University of Wisconsin, and USDA-ARS in Columbus, Ohio. The project is undertaking investigations on 20 field sites in 9 Midwest States that produce over 60 percent of the U.S. corn crop. It also is positioned to develop climate modeling and field sampling to help farmers adapt to changing climate and drought. Two extension agents in each State provide statewide training on best practices for extreme weather.

Water and Water Resources: Funding from the AFRI Foundational Science program in renewable energy, natural resources, and environment is helping provide drought information to every producer in the U.S. The information is tailored to common decision points and regional needs. The project team of Texas A&M University, North Carolina State University, and Purdue University (Indiana), are working with agricultural producers and decision-makers to develop publications and workshops to ensure that the agricultural community understands the uses and limitations of their projects for identifying drought triggers and for drought decision-making.

In 2014, NIFA is proposing a new challenge area under AFRI to focus on water and water resources, in part because the recent droughts through much of the continental U.S. require that crop and livestock producers have better ways to cope with such conditions. Funded projects will focus

on solutions for water management that link food, water, climate change, energy, and environmental issues. Funding will develop management practices, technologies, and tools for farmers, livestock producers, forest owners, and citizens to improve water resource quantity and quality. This program area will be coordinated with and leverage efforts in the Agricultural Production and Climate Variability and Sustainable Bioenergy challenge areas, and help solve critical water resource problems in rural and agricultural watersheds across the U.S.

Sustainable Bioenergy: AFRI sustainable bioenergy funding will support regional projects that link research for sustainable biomass production, logistics of handling feedstocks for biofuels, and education programs to develop skills needed in the workforce. Ongoing targeted research will focus on enhanced value co-products, crop protection, land-use changes resulting from feedstock production and conversion, implications of the development of bioenergy delivery systems on water, and identification of socioeconomic impacts of biofuels in rural communities in order to enhance sustainable rural economies.

NIFA supports the President's comprehensive plan to invest in alternative and renewable energy. AFRI is funding six CAPs that focus on the development of regional systems for the sustainable production of advanced biofuels and biobased products from non-food dedicated biomass feedstocks such as perennial grasses, sorghum, energy cane, oilseed crops, and woody biomass. These projects will ultimately enhance national energy security and rural prosperity through bioenergy.

Nutrition and Health: AFRI will support nutrition and health projects that focus on children and adolescents ages 2-19, to generate knowledge of the behavioral, social, cultural, and/or environmental factors, including the food environment, that influence childhood obesity. The data then will be used to develop and implement effective family, peer, community, and/or school-based interventions that promote healthy behaviors in children and adolescents to prevent overweight and obesity. For example, researchers at North Carolina State University partnered with communities in Western Harnett County, Lee County, and Southeast Raleigh to promote access to healthy foods and physical activity in low-income communities. Additionally, the Expanded Food and Nutrition Education Program (EFNEP) is being promoted through the AFRI project to create new EFNEP classes where needed.

Food Safety: NIFA is committed to advancing the safety of the U.S. food supply through new and improved rapid detection methods, pre- and post-harvest epidemiological studies, and improved food harvesting and processing technologies. NIFA will fund critical environmental and ecological research to improve our understanding of disease-causing microorganisms, antibiotic resistance, food allergies, and of naturally occurring contaminants in meats, poultry, seafood, and fresh fruits and vegetables. AFRI Food Safety funds also will address efforts to minimize antibiotic resistance transmission through the food chain, and microbial food safety hazards of fresh and fresh-cut fruits and vegetables.

Tennessee State University is studying ways to reduce illnesses from *Salmonella* and *Campylobacter* by improving consumer storage, handling, and preparation of raw poultry and poultry products. They are developing and evaluating research-based, consumer friendly, web-enhanced educational materials to educate consumers on practices to reduce their risk of food-borne illness. This research will identify risky practices and develop science-based and consumer-focused messaging to modify consumer behavior.

Foundational Science: NIFA has committed 38 percent of AFRI funding to foundational science. Funding will allow substantive research investments in AFRI's congressionally-established priority areas. In response to stakeholder inputs, NIFA proposes to initiate the AFRI-Critical Agricultural Research and Extension (CARE) Competition under Foundational Science. The CARE Competition will focus on short-term issues important to agricultural production. The program will prioritize funding for high quality plant and animal production and protection projects that focus on animal production, crop production, crop and animal product quality, and/or crop and livestock health management.

A beef feed efficiency CAP is bringing together researchers, educators, and extension specialists from seven Land-Grant Universities and the Agricultural Research Service (ARS) Meat Animal Research Center (Clay Center, Nebraska). This interdisciplinary effort will improve feed efficiency, thereby reducing feed costs that typically comprise 65-80 percent of the cost of raising livestock. Foundational Science will challenge the work under this CAP and other activities as we move forward to develop enhanced agricultural production practices, thus, contributing to the profitability of producers.

Food, Agricultural, Natural Resources, and Human Sciences Education and Literacy Initiative: NIFA is proposing this new initiative to enhance science, agriculture, food, and environmental and education literacy in schools and colleges across America that offer education in the food, agricultural, natural resources and human sciences disciplines. AFRI will support activities for pre-doctoral and post-doctoral education and research training through awards made to individuals pursuing research careers in NIFA research priority areas. The initiative will develop agriculturally-related science learning and engagement activities focused on the K-20 academic pipeline and will support agricultural-science related workforce careers, through student scholarships, fellowships and traineeships. Through this literacy initiative USDA seeks to ensure that the workforce needs are met in the food and agricultural systems, which are experiencing unprecedented growth.

Sustainable Agriculture

For 2014, NIFA requests $23 million for sustainable agriculture activities. We propose to consolidate research and extension funding for the respective Sustainable Agriculture Research and Education Program, and Sustainable Agriculture Program into a single program called Sustainable Agriculture Research and Education Program to be administered under Research and Education Activities. The consolidated program will support systems research and farmer and rancher projects that address crop and livestock production and marketing, stewardship of soil and other natural resources, economics, and quality of life. Funds also will be used to develop technical guides, handbooks, education, and training for Cooperative Extension System agents and other agricultural professionals involved in the education and transfer of technical information concerning sustainable agriculture.

Crop Protection/Pest Management

NIFA has listened extensively to Congress, stakeholders, and partners and has modified administration of the pest management programs portfolio. NIFA solicited formal comments from the public in the spring of 2012 and received feedback from universities, commodity groups, grower associations, industry, and individuals. The input and comments encouraged consolidation of lines that had related, similar, or overlapping purposes. Among the many comments received about the 2013 budget proposal, a substantial number advised against the inclusion of the Minor Crops Pest Management program in the consolidation.

The 2014 Budget will maintain the Minor Crops Pest Management Program as a stand-alone program. However, to promote a more comprehensive approach to developing alternatives for Crop Pest Management, the Budget proposes to consolidate funding for the three special research programs under Improved Pest Control; the extension program Smith-Lever 3(d) Pest Management; and the integrated program Regional Pest Management Centers into a single integrated program, called Crop Protection/Pest Management to be administered under integrated activities.

In 2014, $17 million in funding will support Improved Pest Management (IPM) projects that respond to pest management challenges with coordinated State-based, regional and national research education, and extension programs. This funding will serve as a catalyst to promote further development and use of IPM approaches and it will foster regional and national team building efforts, communication networks, and enhanced stakeholder participation. The program will focus on plant protection tactics and tools, diversified IPM systems, enhancing agricultural biosecurity, IPM for sustainable communities, and development of the next generation of IPM scientists. This consolidation will enhance NIFA's ability to support the synergistic research, education, and extension activities needed to ensure global food security.

Capacity Programs

NIFA recognizes the importance and the significant impact capacity funding has on our State partners and on the research, education, and extension activities they perform. Therefore, during these challenging times for financial resources, we request that funds for capacity programs be maintained at the 2012 funding level. NIFA requests a total of $657 million for Hatch Act, McIntire-Stennis Cooperative Forestry, Evans-Allen Program, Smith-Lever Formula 3(b) and (c), and 1890 Institutions. This level of funding would help maintain current research and extension efforts in production agriculture by our state and university partners.

Minority-Serving Programs

Grants for Insular Areas: The budget includes $1.7 million to enhance resident instruction, curriculum, and teaching programs in food and agricultural sciences in the insular areas of Puerto Rico, U.S Virgin Islands, Guam, American Samoa, the Northern Mariana Islands, Micronesia, the Marshall Islands, and the Republic of Palau. Additionally, the program will support activities

to strengthen the capacity of institutions in these insular areas to carry out collaborative distance food and agricultural education programs using digital network technologies.

Hispanic-Serving Agricultural Colleges and Universities Endowment Fund: The Hispanic/Latino community is the fastest growing sector of the American population. For 2014, the NIFA budget requests $10 million to establish an endowment fund for the Hispanic-Serving Agricultural Colleges and Universities (HSACU). This investment is needed to assist HSACUs compete effectively for NIFA competitive grants. Support for this endowment fund will help in the development of a skilled and marketable student population from the HSACUs for employment in the food and agriculture sector.

Extension Programs

The 2014 budget proposes $459 million in total funding for Extension activities. Funding is proposed for the New Technologies for Agricultural Extension Program to support eXtension (pronounced e-extension), a national web-based information and delivery system. With nearly 26 million page views and over 12 million visits to the public website, the Cooperative Extension System is reaching new and different audiences as well as serving traditional clientele better. Funding for the Children, Youth, and Families at Risk Program will be used to improve the quantity and quality of comprehensive community-based programs. NIFA also proposed funding to assist forest and range landowners and managers in making resource management decisions under the Renewable Resources Extension Act Program.

Other Programs

NIFA's budget proposal includes $4.5 million in Federal administration costs to support modernization of our grant applications systems and process. Such improvements are desperately needed and will save proposal review time in the grant review process. NIFA proposes $0.5 million in extension Federal administration costs for risk management education. NIFA will continue funding for most of the other research, education, and extension programs.

Partnerships

NIFA supports research, education, and extension that focus on meeting society's grand challenges. One way NIFA achieves this is by leveraging resources and expertise by partnering with other Federal agencies. We are partnering with the NSF, National Aeronautics and Space Administration, Environmental Protection Agency, and Department of Energy on interagency

climate change grants that focus on carbon, water, land use change, invasive species, and earth system models. These collaborations synergize research and outreach efforts, and result in cost efficiencies and increased awareness of research developments from multiple agencies. These efforts leverage funds from other agencies for the Nation's benefit, because a greater number of agriculturally-relevant projects are submitted and funded, resulting in an average dollar ratio over the years of greater than 5 to 1.

Similarly, the Ecology and Evolution of Infectious Disease Program connects NIFA with NSF, National Institutes of Health, and the United Kingdom's Biotechnology and Biological Sciences Research Council to enable new understanding in the transmission and prevention of infectious diseases of animals, plants, and humans using a broad, large scale multidisciplinary approach. In FY 2012, NIFA's $1.95 million dollar investment was leveraged six fold, with seven of the twelve awards (58 percent) focused on reducing and/or preventing high priority agricultural diseases that affect poultry, cattle, swine, trout, salmon, and shellfish. Projects include both domestic and foreign animal disease (including foot and mouth disease), as well as studying how to minimize the development of resistance to antibiotics used in agriculture to safeguard people.

Conclusion

In a time of limited resources, NIFA is working closely with, stakeholders and partners to leverage its human and financial resources to advance knowledge in the food and agricultural sciences and to develop solutions to emerging problems. We continue to streamline programs to maximize our research, education, and extension investments in America's agricultural future. With this budget proposal, NIFA will continue to lead food and agricultural sciences to create a better future for the Nation and the world.

Mr. Chairman, this concludes my statement. I will be glad to answer any questions the Subcommittee may have.