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Appropriations

NATIONAL INSTITUTE OF FOOD AND AGRICULTURE

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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 2017 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 U.S. Department of Agriculture (USDA).

NIFA's vision is to catalyze transformative discoveries, education, and engagement to address our Nation's most pressing societal challenges. The investments Congress authorizes for research, education, and extension are making significant headway to address agricultural challenges. NIFA's strong partnership with our Nation's land-grant universities and other colleges, farmers and livestock producers, and public and private entities is promoting exemplary research, education, and extension to find real solutions to problems related to food security and safety, nutrition and public health, natural resource stewardship, jobs, and economic health.

NIFA Programs

NIFA supports the future of agriculture and the Nation's wellbeing through its forward-thinking investments in four critical science, education, and engagement programs: Food Production and Sustainability; Food Safety and Nutrition; Bioenergy, Climate, and Environment; and Youth, Family, and Community. NIFA brings together the best and brightest scientists and extension personnel to find solutions to local and global problems. By working with 1862, 1890, and 1994 land-grant universities and colleges, Hispanic-serving institutions, non-land-grant universities and colleges, and other academic institutions and organizations across the Nation, NIFA's investments have wide-reaching benefits across America.

Proposal

The President's Fiscal Year (FY) 2017 budget proposes approximately $1.4 billion in discretionary funding and approximately $500 million in mandatory funds. The budget proposes doubling the Agriculture and Food Research Initiative (AFRI) funding to $700 million, and

requests funding for several new programs, including $10 million for a competitive awards program that supports the 1890 Capacity Coordination Initiative; $2.5 million for a new program to attract veterans for jobs in the agricultural sector; $20 million for a new competitive program to support high-risk, high-need maternal, child, and family health in remote rural and tribal areas; and $10 million to establish the Hispanic-serving institutions endowment fund. The budget also includes increases to support Crop Protection/Pest Management, including pollinator health; the Sustainable Agriculture Research and Education program; the Food and Agriculture Defense Initiative, which includes the nationally-coordinated plant and animal disease diagnostic networks; and minority and youth-serving organizations.

NIFA's requested funding will support research that underpins transformative discoveries needed to solve challenges to our Nation's nutritional security, including diminishing land and water resources, changing climate, and the need for environmental stewardship, in the context of the burgeoning population. Additionally, the proposed budget will provide critical funding for research, education, and extension in support of Presidential initiatives, including emerging issues of antimicrobial resistance, pollinator health, and clean energy; and the need for a highly skilled workforce and the next generation of scientists. NIFA's goal is to significantly boost agricultural production, while minimizing agriculture's ecological footprint. NIFA will invest in strategic initiatives to promote and improve the use of systems approaches to collectively improve the many facets of the agricultural system: from farms to consumers. These initiatives will transform the way we produce, process, consume, and dispose of food.

Agriculture and Food Research Initiative (AFRI)

AFRI is our Nation's flagship competitive grants program for food and agricultural research, education, and extension. The President's 2017 Budget proposal requests a doubling of AFRI funding to its fully authorized level of $700 million through discretionary and proposed mandatory funds. Several organizations have released statements for the President's Budget request, including the American Bureau Federation, the Supporters of Agricultural Research Foundation, the National Sustainable Agriculture Coalition, and numerous scientific societies and other stakeholders.

NIFA is requesting mandatory funding for AFRI in the amount of $325 million as a complement to the discretionary AFRI funding. This funding will be invested in facilitating systems approaches that will comprehensively address agricultural challenges while developing

knowledge, technologies, and practices our Nation needs to sustain agricultural production in the context of climate change and diminishing land and water resources, and the need to ensure nutritional security of the growing population. The funding will sustainably increase agricultural production through transdisciplinary and transformative agricultural systems projects that: expand foundational knowledge; engineer innovative technologies and advanced manufacturing; devise prudent management strategies; and develop integrated educational programs to meet current and future agricultural workforce demands. Extension services will be an integral partner, bringing groundbreaking discoveries from research laboratories to farms, communities, and classrooms.

Additionally, NIFA requests discretionary funding for AFRI in the amount of $375 million, an increase of $25 million for clean energy research as part of the Presidential Initiative to invest in this critical area. The proposed funding will support science priorities that focus on the creation, translation, delivery, and application of new knowledge in agriculturally relevant areas, including: foundational sciences; water for food production systems; food safety; childhood obesity prevention; climate variability and change; sustainable bioenergy; and education and literacy.

Foundational Sciences

In FY 2017, research investments will support the discovery of foundational knowledge in the six Farm Bill priority areas, and will also support Presidential Initiatives, including antimicrobial resistance, pollinator health, and clean energy. For example, for the Animal Health and Production and Animal Products program area, NIFA supports research on the emergence of zoonotic diseases, innovation in life sciences, and the microbial communities—microbiomes—of agricultural animals. Similarly, for the Plant Health and Production and Plant Products program, NIFA will support efforts in synthetic biology for agriculture. For the Agriculture Economics and Rural Communities program area, investments will be made in regulatory science for future bioeconomy products. Examples of AFRI–funded foundational science include the creation of new vaccines to prevent avian influenza outbreaks in poultry, which cost the U.S. poultry producers $950 million in 2015. Researchers studying colony collapse disorder in honey bees have identified a new exposure route of bees to insecticide and are developing alternatives that reduce risks to honey bees, which pollinate more than 100 different crops in the U.S.

The Critical Agricultural Research and Extension program will help to develop the urgent tools and technologies producers need to deploy in their production systems.

The Exploratory Research program will fund projects that develop proof-of-concepts for untested, innovative ideas, especially high-risk/high-reward work that may lead to significant improvements in U.S. agriculture.

Water for Food Production Systems

With the consolidation of the Food Security and Water for Agriculture Challenge areas, this new Water for Food Production Systems challenge area will ensure sustainable production of safe and nutritious food by developing solutions to water constraints that impact food production. These investments will continue to promote development of solutions to critical water problems in food production systems and will address the social and economic barriers for adoption of water conservation technologies and practices. Combined, the research, education, and outreach portfolio is expected to catalyze the next revolution in production agriculture by providing breakthrough technologies and data-driven decision tools, generating locally and regionally-adapted crop cultivars and breeds, and developing prudent water management practices for food production systems. One example of promoting such solutions has helped Native American farmers, ranchers, and natural resource managers in facing their unique set of challenges in adapting to an increasingly variable climate. AFRI-funded research and extension experts, in partnership with Native American scholars and community leaders in the Southwest, are integrating Western science with traditional knowledge to better manage reduced water availability for crop and livestock production, and for fish, wildlife, and natural resource management. Funding also will support research initiated in previous years to improve the health and production of crops and livestock using sustainable and agroecologically relevant approaches. Additional investments will continue to support plant and animal breeding, agronomic and animal management, plant and animal protection, and other approaches to improve food security. For example, scientists supported by AFRI identified a gene in corn that increases yield under drought conditions in the Southern U.S., where corn seed sales are worth over $180 million in Texas alone. Beneficial variants of the gene were incorporated into corn varieties to improve tolerance to drought and increase production by 15 bushels per acre.

Food Safety

NIFA will invest in science to better protect consumers from microbial and chemical hazards that may be present from "farm-to-fork," addressing problems such as natural, accidental, or intentional causes of food contamination by pathogens, toxins, and chemicals. For example, scientists are developing new technologies, control and mitigation strategies, and education and outreach activities to reduce Shiga-toxigenic *E. coli (STEC)* throughout the beef food chain to improve public health and enhance sustainability of the beef supply. STEC causes over 265,000 illnesses annually in the U.S., costing more than $478 million. Other AFRI-funded researchers have reduced or eliminated the symptoms of peanut allergy by treating peanuts with enzyme-based post-harvest technologies, which are now patented and licensed for future commercialization. In support of the President's National Strategy for Combating Antibiotic Resistant Bacteria, projects will also comprehensively investigate antimicrobial resistance as well as microbiomes associated with soil, air, water, production agriculture, and aquaculture. Due to the growing concern that antibiotic use in agriculture promotes antibiotic resistance of pathogens, researchers are already working to generate real-time, science-based responses, and solutions to antibiotic resistance to improve public health.

Childhood Obesity Prevention

Prevalence of overweight and obese children and adolescents have tripled in the past 30 years. NIFA will invest in innovative projects to facilitate reduction in the number of overweight and obese children, ages 2-19 years. Specifically, projects will identify and implement effective family, peer, community, and school-based interventions to prevent and reverse overweight and obese trends, and promote healthy behaviors. Funding also will focus on long-term and sustained strategies to prevent childhood obesity by improving access to healthy food and enhancing the physical activity environments of communities of greatest need. A project currently funded by AFRI is improving health behaviors of four-year-old children in rural communities where 56 percent of families have an annual income of less than $34,000. This project incorporates willingness to try new foods, increasing motor performance in preschool, and developing mobile applications to improve parent-child interaction related to healthy eating and physical activity. Thus far, the program has increased preschooler's motor skills and prevented weight gain in preschool children who were overweight or obese at the beginning of the program.

Climate Variability and Change

Outcomes of these investments will help farmers, ranchers, forest owners, and rural communities adapt to climate variation, reduce greenhouse gas emissions, and improve the sustainability of food and fiber production. The program will focus on climate-resilient land use for agriculture and forestry as well as the impact of climate on the microbiome of agricultural production systems. For example, the AFRI-funded Triticeae (barley and wheat) Coordinated Agricultural Project has produced 70 improved varieties and germplasm for farmers and consumers that maximize carbon sequestration and can be adapted to current and future climate conditions.

Sustainable Bioenergy

NIFA's Sustainable Bioenergy and Bioeconomy portfolio links feedstock development, production, conversion, and markets in the creation of commercial-scale, advanced non-grain based ethanol biofuels and biobased products that are compatible with and integrated into existing infrastructure. NIFA proposes continued funding for developing pest-killed trees, grasses, oil-seed, and willow trees as feedstocks for biofuels. AFRI funding increases totaling $25 million will support the President's Clean Energy Initiative. Funding for new grants, $15 million, will focus on biomass crop protection, risk mitigation, and improving feedstock handling logistics and pre-processing technologies. This support will improve water-efficiency in biomass crop production, preprocessing, and conversion to fuels while also promoting efficient wastewater treatment. For example, AFRI-funded researchers have developed cold-tolerant energy cane—a special type of sugar cane with increased fiber and sucrose—for bioenergy feedstock production outside of warm coastal regions. Use of sweet sorghum to augment energy cane allows year-round operation of associated biorefineries. Both crops require less water and nutrients than traditional crops. A commercial partner is working to convert energy cane into alternative jet fuel.

Education and Literacy Initiative

During the last few years, AFRI funding has contributed to the education and training each year of over 2,000 undergraduate and graduate students and postdoctoral researchers; however, there continues to be significant need for graduates in the food, agricultural, natural resource, and human sciences. Indeed, several recent studies have shown there exists a significant gap between jobs being created and availability of graduates in these disciplines.

Investments through this initiative will support development of a diverse workforce by: enhancing experiential learning opportunities for undergraduates that provide the skills necessary to succeed in these fields, providing professional development opportunities for K-12 and community college education professionals to promote engaged learning and positive youth development in their classrooms, and advancing science by supporting graduate and postgraduate education. A new addition to this initiative will include training grant opportunities in the food and agricultural sciences.

1890's Capacity Coordination Initiative

The 1890's Capacity Coordination Initiative will support the 1890 land-grant institutions in developing a diverse agricultural workforce to provide high-quality agricultural outputs, assisting resource-limited and small farmers, ranchers, and foresters to promote sustainable enterprises, and preparing a workforce that will engage internationally to foster international cooperation, trade, development, and improved global food security. The proposed $10 million funding is to support three centers, designed to increase diversity in the science, technology, engineering, and mathematics pipeline; increase profitability and jobs in underserved farming communities; and enhance talent preparation related to global food security. The long-term outcomes include healthier families, enhanced quality of life in rural communities, and increased opportunities for the sustainability of small farms.

Sustainable Agriculture Research and Education (SARE)

The SARE program helps farmers and ranchers adopt practices that are profitable, environmentally sound, and beneficial for communities. The program has a 25-year track record of success and stakeholder support from farmers and ranchers, the agricultural science community, and among Federal agencies that benefit from the SARE research and education activities. NIFA is requesting an increase to $30 million to support beginning farmers and ranchers to adopt sustainable agricultural practices, and to expand support for graduate students in sustainable agriculture.

Food and Agriculture Resiliency Program for Military Veterans (FARM-Vets)

Understanding why and how best to engage veterans in the agricultural sector is congruent with the critical need to identify a new generation of farmers, livestock producers, and entrepreneurs with the aging agricultural workforce, especially in rural areas where shortages are acute. There is limited research on the therapeutic value of agriculture in terms of psychological

and behavioral health. The competitive FARM-Vets program will support research and the development of the evidence base, the outcomes of which will benefit veterans in the food and agriculture sector for example by promoting career opportunities and pathways, therapeutic interventions, and resource conservation. The requested $2.5 million will support projects to inform the establishment and scalability of educational programming that helps veterans develop farming and ranching skills, business plans, and agriculture systems management.

Smith-Lever 3(d) Programs

Under the Smith-Lever 3(d) program, the budget includes a request for $20 million for the new, competitive Home Visits for Remote Areas Program (HVRAP). The program will promote long-term, sustainable, and culturally-appropriate maternal, child, and family health education outreach to high-risk, high-need individuals in remote rural and tribal areas using models that are proven to improve child health and to be cost effective. HVRAP will be implemented by the Cooperative Extension System and other eligible entities, in coordination with existing federal programs, such as the U.S. Department of Health and Human Service's Maternal, Infant, and Early Childhood Home Visiting Program. The proposal focuses exclusively on serving eligible families in high-need, very remote, rural and tribal areas, a constituency that Extension – with its unique network, relationships, and expertise in rural America – is particularly well-suited to serve. This program also complements NIFA programs, such as Children, Youth, and Families at Risk and community nutrition education programs, which deliver land-grant based programming primarily in community-level settings.

The Smith-Lever 3(d) program also includes a $68 million increase to continue nutrition education for low-income and minority populations through the Expanded Food and Nutrition Education Program, and a $6 million increase to double the number of staff engaged in 4-H activities for tribal youth through the Federally Recognized Tribes Extension Program.

Crop Protection/Pest Management (CPPM)

The requested funding of $20 million will help agricultural producers implement pest management strategies that increase productivity, while protecting the health of pollinators and other beneficial organisms. The increased funding will allow the CPPM program to support integrated pest management (IPM) projects that respond to pest management challenges with coordinated State, regional, and national research, education, and extension programs, and promote further development and use of IPM approaches.

Food and Agriculture Defense Initiative (FADI)

The budget requests $10 million for the FADI program to enhance the tactical capabilities of the National Plant Diagnostic Network (NPDN), National Animal Health Laboratory Network (NAHLN), and Extension Disaster Education Network (EDEN). The NPDN and NAHLN identify and respond to high-risk biological pathogens in the food and agricultural system to protect the Nation from plant and animal disease threats through surveillance, early detection, mitigation, and recovery. EDEN is a national effort led by the State Cooperative Extension Service that provides disaster education resources for extension educators. This increase will allow the three networks to better use improved diagnostic technologies and data infrastructure; upgrade their instrumentation; expand diagnostic test capabilities and through-put potential; and develop more effective laboratory information and data management. The outcomes of these increased investments will allow better protection of the U.S. food and agriculture trade, livestock and crop health, and public well-being from acute catastrophic challenges.

Minority-Serving and Youth Serving Institutions

The Minority-Serving Institutions provide education opportunities to those who have historically faced inequality in their access to higher education. In 2017, NIFA proposes increases in the Evans-Allen, 1890 Capacity Building Education Grants, 1890 Extension, and 1890 Facilities programs to enhance innovation; support the training of African-American students; and address epidemics within minority communities, such as adult and childhood obesity and diabetes. The President's Budget requests a total of $148 million for these programs.

The budget also requests increases in the 1994 Research, Tribal Colleges Education Equity, and Extension Services at 1994 Institutions programs to assist these institutions in developing new partnerships, building research and extension capacity, and serving a larger American Indian student population. The President's budget requests a total of $29 million for these programs.

The 2017 budget proposes $1 million for Grants for Youth-Serving Institutions to support pilot-demonstration projects in rural communities. This program is a priority at the local and/or state levels to help children and youth develop the skills, knowledge, and competencies they need to have healthy and successful lives.

The Hispanic/Latino community is the fastest growing sector of the American population. The President's budget requests $10 million to establish an endowment fund for the Hispanic-Serving Agricultural Colleges and Universities (HSACU). Funds from this endowment will help Hispanics to overcome barriers in developing the skills and marketability needed for filling the numerous projected job openings in the food and agricultural sector. Increasing investment in HSACUs will help close this educational gap while addressing our nation's need for a qualified workforce.

Other Programs

The budget proposes eliminating the Aquaculture Centers Program. NIFA will incorporate priorities for aquaculture programs within specific program priorities of the AFRI request for applications. Program efficiencies will be realized in terms of award size and administrative costs to support grants in this area, by combining efforts through AFRI.

Management Initiative

Finally, the President's budget includes a proposal to eliminate the old account structure from NIFA's predecessor agencies and create a single unified account to house all NIFA research, extension, and education programs. Merging all funding lines within a single account structure will mirror the reorganization of the agency as a national institute with a unified mission and provide opportunities to streamline the administration of funds. The merger will not impact the function or funding level of any program, but will help simplify the management of funds within the financial systems.

Conclusion

NIFA will invest in fundamental and applied science so that American citizens will be healthier and nutritionally secure. Through our work, decision makers will have science-based information to make informed decisions, support vibrant and sustainable communities, and solidify our Nation's agricultural economy in order to continue its prosperity and job creation.

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