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Food, Nutrition, Agriculture, and Natural Resource Sciences in the FY 2011 Budget

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HIGHLIGHTS

– **USDA proposed an increase in funding for NIFA’s competitive Agriculture and Food Research Initiative** from \$262 million in FY 2010 to \$429 million in FY 2011. Of the requested amount, AFRI is dedicating \$20 million in FY 2011 towards Food Safety research funding and an additional \$50 million is proposed for the Human Nutrition and Obesity section.

– **NSF’s Basic Research to Enable Agricultural Development (BREAD) Program** received initial federal support of \$6 million for basic research to test innovative hypotheses, approaches, and technologies for sustainable, science-based solutions to problems of agriculture in developing countries.

– The President’s budget announced an additional \$10 M for increased support to five **USDA regional feedstock research and demonstration centers**.

Table 1. Food, Nutrition, Agriculture, and Natural Resource Sciences R&D in the Federal Budget (budget authority in millions of dollars)

	FY 2009	ARRA	FY 2010	FY 2011	Change FY 10-11	
	Actual	Estimate	Estimate	Budget	Amount	Percent
US Dept of Agriculture R&D						
NIFA						
Food Safety	27	0	34	54	20	58.8%
Food Security - Other	NA	0	380	334	-47	-12.3%
Food Security - ISE	3	0	3	3	0	3.4%
Nutrition	50	0	50	99	49	97.2%
Biofuels	NA	0	86	107	21	24.4%
ARS						
Food Safety	106	0	108	114	6	5.6%
Food Security	NA	0	615	633	17	2.8%
Nutrition	85	0	90	92	3	2.9%
Biofuels	NA	0	34	42	7	21.3%
ERS						
Food Safety	1	0	2	2	0	0.0%
Food Security	NA	0	2	2	0	0.0%
Nutrition	12	0	16	19	3	18.9%
Biofuels	NA	0	2	2	0	0.0%
Forest Service						
Biofuels	13	0	13	13	0	0.0%
Dept of Health and Human Serv						
FDA						
Food Safety	56	0	64	77	13	20.3%
NIH						
Food Safety	30,554	10,400	31,247	32,247	1,000	3.2%
Nutrition	262	0	268	276	8	3.0%
Nutrition - Obesity	1,400	313	1,435	1,475	40	2.8%
	745	0	763	784	21	2.8%
National Science Foundation						
Food Security - BREAD	0	0	6	6	0	0.0%
USAID						
Food Security - CRSP	29	0	32	32	0	0.0%
Dept of Energy						
Biofuels - BRC	0	0	75	75	0	0.0%
Biofuels - FI	15	0	37	26	-11	-29.7%

Source: Agency budget justifications and other budget documents.

All figures rounded to the nearest million. Changes calculated from unrounded figures.

INTRODUCTION

Food, agricultural, nutrition, and natural resource sciences are poised to make major contributions to improve human health and protect our environment. With the launch of the National Institute of Food and Agriculture (NIFA) in 2009, Agriculture Secretary Tom Vilsack said “the opportunity to truly transform a field of science happens at best once a generation.” With the release of a report by the United Nations Food and Agriculture Organization stating that food production will need to nearly double by 2050 to meet the demands of a world population totaling more than nine billion, this announcement is timely. The current

administration has identified five “societal challenge” areas for emphasis including ending world hunger, improving nutrition and reducing child obesity, ensuring food safety for all Americans, securing America’s energy future through renewable biofuels, and mitigating and adapting agriculture to climate change.

FOOD SAFETY

American consumers enjoy one of the safest food supplies in the world. However in order to keep pace with changes in the global food supply chain, production, and consumption we need to continue to build upon and improve our nation's food supply from both unintentional contamination (food safety) and deliberate attack (food defense).

The Obama Administration has made food safety reform a major domestic policy initiative. On March 14, 2009, President Obama announced the creation of the Food Safety Working Group, chaired by the Secretaries of the Department of Health and Human Services and the Department of Agriculture. This group was created to advise the Administration on how to upgrade the food safety system for the 21st century. The Working Group has recommended a new, public health-focused approach to food safety based on three core principles: prioritizing prevention; strengthening surveillance and enforcement; and improving response and recovery.

Federal R&D funding for food safety primarily resides within the USDA and HHS budgets. Within USDA, the largest portion of research funding is found within ARS and NIFA. While ARS is the USDA’s in-house scientific research agency, NIFA is the USDA’s major extramural research agency funding individuals, institutions, and public, private, and non-profit organizations.

The USDA has proposed an increase in funding for NIFA’s **competitive Agriculture and Food Research Initiative** from \$262 million in FY 2010 to \$429 million in FY 2011. Of the requested amount, AFRI is dedicating \$20 million in FY 2011 towards Food Safety research funding. The FY 2011 budget includes an increase of approximately \$6 million to enhance research to safeguard the Nation’s food supply through food safety research by the **Agriculture Research Service (ARS)**.

HHS will invest approximately \$1.4 billion to strengthen food safety efforts and implement the core principles of the President's Food Safety Working Group. The FDA requests \$326.3 million for the Transforming Food Safety Initiative, which reflects President Obama's vision of a new food safety system to protect the American public. The FDA will set standards for safety, expand laboratory capacity, pilot track and trace technology, strengthen its import safety program, improve data collection and risk analysis, and begin to establish an integrated national food safety system with strengthened inspection and response capacity.

FOOD SECURITY

Global food security, access to affordable, safe, and nutritious food, is critical to overcoming poverty and achieving global stability. The **United Nations Food and Agriculture Organization (FAO)**, **USDA** and **United States Agency for International Development (USAID)** have identified 'food security' as a key focus and challenge for global institutions in the coming years, especially in the face of a rapidly growing world population. In the next 40 years, it is estimated that the global population will increase by 2.4 billion to over 9 billion, requiring a doubling of production and better distribution systems for agricultural products.

FAO estimates that 70 percent of new agricultural production will come from adoption of new or existing technologies and 30 percent from new production on marginal land or from increased yields on land already in production. Today, scientists are working in interdisciplinary research teams to develop new production tools and sustainable production systems appropriate for farmers' needs, which require fewer inputs—energy, land, nutrients, and water.

Some of the food security programs at USAID include the **Global Hunger and Food Security Initiative (Initiative)**, unveiled in 2009, which will commit \$1 billion to the development of strategies to overcome hunger and mitigate food insecurity. One key element of the Initiative is a commitment to research that addresses agricultural technology needs. The Initiative renews investments in national and international research systems, including the **Consultative Group on International Agricultural Research (CGIAR)** in developing countries, as well as training of students in science and applications that will support ongoing R&D for the agricultural sector. **Collaborative Research Support Programs (CRSP)** support collaborative work

between U.S. universities and international partners to address critical agriculture and food security issues. Together, the **CGIAR and CRSP programs reflect a significant part of the government's approach to improving global food security**. Through plant and animal breeding and germplasm collection and preservation, the CGIAR system helps find country-led solutions to food security challenges by harnessing science and technology to boost agricultural productivity.¹

In the National Institute of Food and Agriculture (NIFA) at the US Department of Agriculture (USDA), the **International Science and Education Competitive Grants Program (ISE)** supports research, extension, and teaching activities that will enhance the capabilities of American colleges and universities to conduct international collaborative research, extension and teaching. The principal **USDA NIFA** competitive grants program, **Agriculture and Food Research Initiative (AFRI)**, supports increased food security through the expansion of R&D on plant and animal diseases that threaten public health and agricultural production. The President's FY 2011 budget proposes a significant increase in AFRI, of which \$13 million would be for this purpose.

Finally, NSF's Basic Research to Enable Agricultural Development (BREAD) Program will receive initial support of at least \$6 million in FY 2011 for basic research to test innovative hypotheses, approaches, and technologies for sustainable, science-based solutions to problems of agriculture in developing countries. BREAD is supported by both NSF and contributions from the Bill and Melinda Gates Foundation.

NUTRITION & OBESITY

Nutrition is essential to life, and in the past century our knowledge about how foods nourish our bodies and contribute to health has grown exponentially. Since the late 1800s, federal government support for nutrition research has led to breakthroughs in our understanding of food composition, human nutrition requirements, and dietary patterns. In essence, human nutrition research enables us to make the connection between what we grow, what we eat and our health—from prevention to chronic disease management at the primary, secondary and tertiary levels.

¹Funding decisions for this program are made under the discretion of the U.S. Department of State.

Overweight and obesity have taken center stage as the public health challenge. Nutrition research is indispensable to furthering our understanding of and ability to effectively address this epidemic. With approximately 65 percent of U.S. adults and 30 percent of children and adolescents classified as overweight or obese, preventable chronic diseases related to diet and physical activity cost our economy over \$117 billion annually. This cost is predicted to rise to \$1.7 trillion in the next 10 years.

Basic and applied research on human nutrition and nutrient composition, food processing and nutrition monitoring is essential to the economy. This research and data collection form the foundation on which federal nutrition policy is based and multi-billion dollar nutrition assistance programs are guided. Although the U.S. historically has had the world's most nutritious, most affordable and safest food supply, our population suffers from some of the highest rates of diabetes, heart disease, and obesity in the world. Awareness of this paradox and the impact on health care costs underscores the need for improved information on dietary intake and improved strategies for dietary change.

The National Institutes of Health (NIH) funds 90 percent of government-funded nutrition research, followed by the USDA. Other departments that fund a limited amount of competitively-awarded nutrition projects are the Departments of Defense (DoD), Veterans Affairs, and the National Aeronautics and Space Administration. For example, the DoD has funded several extramural projects on breast cancer and nutrition. The FDA also currently funds research on consumer use of the food label. The National Center for Health Statistics at the Centers for Disease Control and Prevention, in partnership with USDA, is responsible for nutrition monitoring--- administering and compiling data from the USDA's What We Eat in America dietary survey that is part of the National Health and Nutrition Examination Survey (NHANES). It is the only nationally representative nutrition survey in the nation that provides foundational reference data for what the country is consuming.

Within the NIH, the largest contributors to nutrition research are the NIDDK, NCI and NHLBI. In FY 2009, 4,500 projects were funded on topics such as nutrigenomics, medical nutrition interventions, and behavioral and lifestyle influences on health. Nutrients and diet patterns as they relate to chronic diseases are the most commonly funded areas. **NIH has made a significant investment in obesity-related research across multiple ICs.**

At the USDA NIFA, the AFRI program historically supports projects in Human Nutrition and Obesity, Dietary Bioactive Components, and Food Quality and Value. In FY 2011, an additional \$50 million is proposed for the Human Nutrition and Obesity section. **The USDA ARS Human Nutrition program** conducts essential data collection and food composition analysis. The program has shifted to allocate more resources to obesity, from 10 percent of funds in FY 2004 to almost 40 percent projected for FY 2011. **The USDA ARS Human Nutrition Research Centers (HNRCs)**² are the major portion of the ARS nutrition program and provide critical infrastructure and capacity for nutrition research and the ability to conduct hypothesis-driven research. The centers leverage funds from multiple federal agencies and private sector sources, particularly the university-based centers, but also have the capacity to run large trials with multi-disciplinary teams.

RENEWABLE ENERGY

The U.S. is producing 12 billion gallons per year of biofuels, mostly from corn grain ethanol. Expanding the biofuels industry to achieve the 36 billion gallons target by 2022 will require the development of an expanded agricultural and wood fiber commodity sector, and presents many opportunities and challenges. Rural land use is constantly changing, but there are limits to the extent to which existing land uses can change without disrupting existing food, feed, and fiber markets. One strategy for integrating biofuels feedstocks into existing agricultural production systems is to replace higher-risk, less productive crops or abandoned lands with lower-risk and more productive cellulosic feedstock crops. Also, more intensive, multiple-year management strategies could be used to get greater production from the same amount of land, and thus reduce pressure to expand production onto environmentally sensitive or marginally viable lands.

On May 5, 2009, a Presidential Directive called for accelerated investment in and production of biofuels. The President's Biofuels Interagency Working Group released its first report, *Growing America's Fuels*, which lays out a strategy to advance the development and commercialization of a sustainable biofuels industry. The plan identifies

² There are six HNRCs; three are 100% federally funded and located in Beltsville, MD; Grand Forks, ND; and, Davis, CA. Three are in partnership agreements with universities and are located at Baylor College of Medicine in Houston, TX, the University of Arkansas Medical Sciences in Little Rock, AR and Tufts University in Boston, MA.

USDA as having responsibility for the development of improved non-food biomass crops and woody species varieties, and research into ways to sustainably produce biomass as a part of agricultural production and forest management. The plan also identifies DOE as having responsibility over discovery science inquiry that focuses on longer-term fundamental science breakthroughs for advanced biofuels and to determine suitable technologies for full-scale commercial deployment.

Even though ethanol from corn grain is an important renewable fuel source, and cellulosic ethanol will soon be contributing as well, there is need for research to speed the development of advanced biofuels. However, the markets for the feedstocks required to produce these fuels, and many of the promising process technologies that are needed to make advanced biofuels, have only been demonstrated at bench scale and are just beginning to be developed through the scale-up process. The USDA-Forest Service focuses its bioenergy research investment on the science and technology to sustainably produce, manage, harvest, and convert woody biomass to liquid fuels, chemicals, and other high-value products.

The President's budget announced an additional \$10 M for increased support to **five USDA-ARS regional feedstock research and demonstration centers**. The purpose of the centers is to accelerate the scientific breakthroughs needed to ensure that adequate biomass supplies are available for the production of advanced biofuels and other bio-based products. These centers will develop regional strategies to help as many rural areas across the country as possible participate and benefit economically from expanded biofuel production, while protecting the natural resources base upon which we all depend for clear air, water, and other ecosystem services. The centers bring together the talents and expertise of leading government and university researchers, scientists in private industry, investors, and entrepreneurs.

At the Department of Energy, **Bioenergy Research Centers (BRCs)**, part of the Office of Science, represent multidisciplinary, multi-institutional partnerships between universities, national laboratories, and the private sector created to accelerate the transformational breakthroughs in basic science needed for the development of cost-effective technologies to make production of cellulosic (plant-fiber based) biofuels commercially viable on a national scale. **The Feedstock Infrastructure (FI) Program** in the Office of Energy Efficiency and Renewable Energy (EERE) develops technologies to provide reliable, cost-competitive, and environmentally sustainable biomass feedstock

supplies. FI has three main areas of focus within the platform addressing this overarching strategic goal: feedstock production, feedstock logistics, and environmental sustainability.

ENVIRONMENTAL QUALITY

The ability to identify management practices and decisions that improve water and air quality in agroecosystems is a key element of sustainable agricultural systems. Globally, agriculture faces the challenge of efficiently using land and water resources to produce food, fiber and biofuel feedstocks, while sustaining the land's productive capacity, and minimizing the impact of sediment, nutrient, pesticide, pathogen and pharmaceutical loss to the environment. Similarly, the world's need for fresh water continues to expand, increasing the importance of protecting water quality to ensure its continued use and reuse. Research and development can identify ways to improve the efficiency of existing agricultural production systems, identify and quantify health and environmental effects, and develop new information, technologies, and applications to protect and restore agricultural lands and the environment.

The **USDA Mississippi River Basin Healthy Watersheds Initiative (MRBI)**, announced in November 2009, commits \$320 million over four years to work with agricultural producers to address soil conservation and water quality protection needs in 42 watersheds of the Mississippi River Basin. This project supports basic and applied research in crop production, the development of practices and management strategies to reduce nutrient loss from agricultural lands, the understanding of nutrient fate and transport and the effect of nutrients on the formation, extent, severity, and duration of the Gulf's hypoxic zone. This initiative supports the implementation of the Gulf Hypoxia Action Plan 2008 as well as the regional priorities outlined in the Gulf of Mexico Alliance's Governor's Action Plan II, both of which describe strategies to reduce, mitigate, and control hypoxia in the Gulf and improve water quality in the Mississippi River Basin. The MRBI will involve close collaboration between the EPA, USDA, and the U.S. Geological Survey (USGS) efforts to measure progress in nutrient reduction within the Basin.

At the **USDA ARS**, the Obama Administration has proposed funding in the FY 2011 budget to establish long-term production and environmental management trials in watersheds to develop strategies to sustain agricultural productivity in the Mississippi River Basin, while reducing

unwanted exports from agricultural lands and effectively managing water resources (\$2.5 million). USDA ERS is implementing "N in Agricultural Systems: Implications for Environmental Policy", a research project to assess the status of U.S. agriculture in regards to nitrogen management, and the economic and environmental performance of policy approaches, including financial assistance, water quality trading, and GHG markets and regulation.

The Environmental Protection Agency, Water Quality Research Program (WQRP) is designed to support the Clean Water Act (CWA), providing scientific information and tools to the EPA to help protect and restore the designated uses of water bodies that sustain human health and aquatic life. The program conducts research on the development and application of water quality criteria, the implementation of effective watershed management, and the application of technological options to restore and protect water bodies using information on effective treatment and management alternatives.

Forest Service Research and Development (FS R&D), the world's largest forest research organization, provides scientific information and new technologies to support sustainable management of the Nation's forests and rangelands. Research is directed toward sustaining healthy watersheds, forest products, wildlife protection, outdoor recreation opportunities, and other benefits. The FY 2011 President's Budget proposes \$304 million for Forest and Rangeland Research, a decrease of \$8 million from FY 2010. The proposed budget is spread among Forest Inventory and Analysis (FIA; 20%) and the research areas of: Wildland Fire and Fuels (8%); Invasive Species (12%); Outdoor Recreation (2%); Resource Management and Use (33%); Water, Air, and Soil (11%); Wildlife and Fish (10%); and Inventory and Monitoring (4%). This program anticipates at least \$30 million in grants and agreements to approximately 600 partners.

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