

E.3. Food Safety, Nutrition, and Health

The Food Safety, Nutrition and Health program area addresses CSREES' strategic goals to improve the Nation's nutrition and health, to enhance protection and safety of the Nation's agriculture and food supply and to enhance economic opportunities for agricultural producers by improving the quality and value of food products.

The maintenance of human health is significantly affected by the quantity and quality of food consumed and by foods that are contaminated with disease-causing microorganisms or toxins. Nutrition, obesity prevention, and food quality and safety are of paramount importance to the producer, processor, distributor, and consumer. The overall goals of the Food Safety, Nutrition and Health program area are to:

1. Improve our understanding of the behavioral and environmental factors that influence obesity and use this new information to develop and evaluate effective interventions for obesity prevention.
2. Contribute to our knowledge of the requirements and bioavailability of nutrients and other beneficial food components and factors, including food processing technologies and interrelationships among dietary components that impact optimal human nutrition or food quality.
3. Increase our understanding of disease-causing pathogens and toxins, the risk factors that influence food-borne organisms and food safety, and the risk factors that lead to the development and implementation of mitigation or control strategies.

Data generated from these studies will be used for updating dietary recommendations, formulating National nutrition and food safety policy, and stimulating new product developments by the food industry.

In FY 2009 the AFRI invites applications in the following programs in the Food Safety, Nutrition and Health area:

- a. Bioactive Food Components for Optimal Health**
- b. Food Safety and Epidemiology**
- c. Human Nutrition and Obesity**
- d. Improving Food Quality and Value**

The following cross-cutting AFRI programs also contribute to the goals of the Food Safety, Nutrition and Health area:

Agribusiness Markets and Trade
Animal Protection and Biosecurity
Microbial Genomics
Nanoscale Science and Engineering
Water and Watersheds

a. Bioactive Food Components for Optimal Health

Program Code - 93130

National Program Leader – Dr. Etta Saltos (202-401-5178 or esaltos@csrees.usda.gov)

Total Program Funds – approximately \$4.6 million, with up to 4.1 million for research projects and up to \$500,000 for an education project.

Proposed Budget Requests –

- Proposed research project budget requests must not exceed \$500,000 for project period of 2-4 years (including indirect costs).
- Proposed education project budget requests must not exceed \$1 million for project periods of 4 years (including indirect costs). This project will be funded jointly by the Bioactive Food Components for

Optimal Health and Improving Food Quality and Value programs with \$500,000 contributed by each program.

- Requests exceeding the budgetary guidelines above will be returned without review.

Letter of Intent Deadline– January 22, 2009 (5:00 P.M., ET) (for research projects only); see Part II, F for submission format and instructions.

Anticipated Application Deadline – April 7, 2009 (5:00 P.M., ET); the firm deadline will be made available in the AFRI RFA.

Background

The consumption of a nutritious diet is important for maintaining long-term health and decreasing the risk for chronic disease. The primary objective of this program is to support research to improve our understanding of the role of nutrients and other biologically active components in foods in promoting health throughout the life cycle, including pregnancy, early development and growth, and aging. Projects that support the update of Dietary Reference Intake recommendations are especially encouraged. Program objectives are relevant to the research recommendations outlined in the Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans, 2005 and to the Dietary Reference Intakes Research Synthesis published by the National Academy of Sciences.

To meet these identified needs of agriculture, the long-term (10-year) goal of the program is to provide evidence concerning health effects of nutrients and other bioactive food components that can be used by scientific organizations in revising or selecting endpoints for setting dietary reference intakes and tolerable upper limits for such components (e.g. omega-3 fatty acids, vitamin D, calcium, soy phytoestrogens, and resveratrol). Additionally, the program will coordinate with other CSREES programs in supporting integrated projects (announced in a separate RFA) to develop novel and health-enhancing foods.

FY 2009 Priorities for Research Projects – Applicants must address at least one of the following priorities.

1. Studies of the function and efficacy of nutrients and/or other dietary bioactive components in promoting health. Projects to develop biomarkers to measure human health outcomes and projects using dose-response methodology are encouraged. For FY 2009, proposals must focus on one of the following health concerns:
 - a. Prevention of inflammation.
 - b. Promotion of bone health.
2. Development of animal models to assess the safety of biologically active ingredients added to foods. When appropriate, the use of agriculturally important domestic species as models for human health outcomes is encouraged.

Other Key Information

- A letter of intent is required for this program. The letter of intent deadline is **January 22, 2009, by 5:00 P.M., Eastern Time**. Format and content for the letter of intent can be found in Part II, F.
- **This is a non-integrated program. Please refer to Part III, A for eligibility criteria.**
- Applications dealing with food processing techniques should consider submission to the Improving Food Quality and Value program unless they are clearly oriented toward dietary effects on optimal human health. Projects to identify process and tailor functional foods to promote energy balance should be submitted to the joint priority with the Improving Food Quality and Value program, which will be announced in a separate AFRI RFA for Integrated Projects.
- Support will not be provided for research on the development of dietary supplements, research on dietary therapies for existing disease, or for the establishment, expansion, or maintenance of dietary databases.
- Surveys of the nutritional status of population groups are not acceptable for this program.
- Applications that do not address at least one of the stated research program priorities will be returned without review.

- If a project is funded, beginning in the first year of funding, the project director will be required to attend annual investigator meetings. Reasonable travel expenses should be included as part of the project budget.

FY 2009 Priority for Education Projects – Applicants must address the following priority.

1. *This is a shared priority of the Bioactive Food Components for Optimal Health and Improving Food Quality and Value Programs.* Development of innovative, research-based, graduate education and training activities in the area of functional foods for improved human health. Faculty from nutrition and food science departments must be represented in each grant application; participation by faculty from other departments (e.g. plant science, animal science, engineering, marketing) is encouraged, as is submissions involving multiple institutions. Students should gain strengths in multiple disciplines while maintaining competence in their major field by focusing on problem-oriented rather than discipline-oriented education and research. The project should offer training and experience relevant to both academic and nonacademic careers by linking graduate education and research, through internships and mentoring, with research and extension in industry, national laboratory, or other settings. Students supported by the project should choose a research problem that integrates multiple disciplines (including food science and nutrition) in working toward a tangible solution to a practical problem.

Other Key Information for Education Projects

- A letter of intent is **not** required for education projects submitted to this program.
- **This is a non-integrated program. Please refer to Part III, A for eligibility criteria.**
- Proposals may request up to \$1 million for four years, including indirect costs. The contribution to the graduate stipend is up to \$30,000 per year per student, accompanied with a tuition allowance of up to \$12,000 per year per student.
- Please see Part IV, A. for the criteria that will be used to evaluate education proposals.
- Applications that do not address the stated education program priority will be returned without review.
- If a project is funded, beginning in the first year of funding, the project director will be required to attend annual investigator meetings. Reasonable travel expenses should be included as part of the project budget.

b. Food Safety and Epidemiology

National Program Leaders – Dr. Nancy Cavallaro (202-401-4082 or ncavallaro@csrees.usda.gov)

Total Program Funds – approximately \$11.2 million

Proposed Budget Requests – This program contains three elements. See each program element for additional budgetary information.

1. Food Safety and Epidemiology: Biological Approaches for Food Safety

2. Food Safety and Epidemiology: Epidemiological Approaches for Food Safety

3. Food Safety and Epidemiology: Practical Approaches to Food Protection

Letter of Intent Deadline – Required for all elements of this program.

Application Deadline – See each program element for additional details.

Overview

The area of food safety remains a high National priority. This is especially true given recent concerns with bioterrorism and food-borne outbreaks in produce, seafood, and other foods. Food safety research is necessary to fill data gaps and reduce the incidence of food-borne disease on the health care system. Research is needed to understand the emergence, persistence, and transmission of food-borne organisms, as well as to develop better interventions and control and prevention strategies along the entire food safety continuum. Food production is a

highly complex set of systems that spans microbial, chemical, and physical hazards. Therefore, improved food safety is a shared responsibility.

The complex nature of food safety necessitates multi-disciplinary solutions. Integration of microbiology, epidemiology, animal science, plant pathology, veterinary medicine, food science, virology, and many other disciplines are vital for the success of research and educational outcomes. The goal of this program is to fund research efforts that provide an increased knowledge of food-borne organisms and disease, and reduce food-borne illness.

1. Food Safety and Epidemiology: Biological Approaches for Food Safety

Program Code - 93231

National Program Leader – Dr. Nancy Cavallaro (202-401-4082 or ncavallaro@csrees.usda.gov)

Total Program Funds – approximately \$5.2 million

Proposed Budget Requests –

- Proposed research project budget requests must not exceed \$400,000 for project period of 2-4 years (including indirect costs).
- Requests exceeding the budgetary guidelines above will not be reviewed.

Letter of Intent Deadline – March 4, 2009 (5:00 P.M., ET); Part II, F for format and submission instructions

Anticipated Application Deadline – May 6, 2009 (5:00 P.M. ET); the firm deadline will be made available in the AFRI RFA.

Background

One of the main objectives of this program is to fund research efforts that result in a demonstrable reduction in food-borne illness. This program supports hypothesis driven research that seeks to increase our knowledge of microbial ecology with regard to the routes of contamination of food; this includes on-farm investigations, post-harvest incidence, processing, and distribution of food. Aspects of microbial ecology that provide for avenues of intervention and mitigation of food-borne illnesses or toxicities are also relevant to this program.

The long-term (10-year) goals of this program are to reduce the number of food-borne illnesses in the U.S. and provide for the safe and economic regulation of food safety issues. A primary function of this program is to provide data and information to risk assessors investigating emerging and ongoing food safety problems. In this regard, areas of focus will be assessed year to year to re-examine priorities and adjust the emphasis in response to emerging issues, as appropriate.

FY 2009 Priorities for Research Projects – Applicants must address at least one of the following priorities.

1. Human enteric viruses, *E. coli*, *Vibrio* spp., *Salmonella* spp., Listeria, or microbial toxins associated with seafood or on fresh fruits, nuts, and vegetables: Proposed studies need to address mitigation measures aimed at reducing colonization by these pathogens in shellfish, finfish, and derived products, cross contamination during packaging and processing of fresh produce, including fruits, nuts, vegetables, and sprouts, which undergo minimal processing post-harvest; multiplication on or within produce; or sensor/detection methodologies linked to practical mitigation measures. Studies elucidating the source and persistence of pathogens in the environment, as they relate to fresh produce and production of toxins, are included. Focus on harvesting methods, post-harvest storage, or processing technologies should include practical methods to reduce pathogen load.
2. *E. coli*, *Salmonella* spp. or *Campylobacter* spp. in poultry, swine and cattle: Proposed studies need to address the pathogen load of *E. coli*, *Salmonella* spp. or *Campylobacter* spp. on farm and the methods of transmission to poultry, swine and cattle; effective mitigation measures during processing and distribution; or genetics of strain development for antibiotic resistance as it relates to enhanced colonization or pathogen load and other virulence determinants.

Other Key Information

- A letter of intent is required for this program. The letter of intent deadline is **March 4, 2009, by 5:00 P.M., Eastern Time**. Format and content for the letter of intent can be found in Part II, F.
- **This is a non-integrated program. Please refer to Part III, A for eligibility criteria.**
- Fresh fruits, nuts, and vegetables include those sold without processing and fresh-cut: fresh fruits and vegetables for human consumption that have been peeled, sliced, chopped, shredded, cored, trimmed, or mashed, with or without washing, prior to being packaged (e.g. pre-cut, packaged, ready-to-eat salad mixes). Studies directed at irrigation, water re-use, and related hydrological issues as they pertain to food safety should consider submission to the Water and Watersheds program. Proposed studies that focus on worker hygiene as it relates to produce contamination or contain an integrated approach involving extension or educational components should consider submission to the Integrated Research, Education, and Extension Competitive Grants Program National Integrated Food Safety Initiative for submission of applications (http://www.csrees.usda.gov/funding/rfas/food_safety.html).
- Surveillance as a principal objective is not
- Research targeting improved or novel detection methods for the designated microorganisms will be considered for funding; however, they must be of direct value in suitable for this program. Research to quantify or monitor the incidence of organisms or toxins responsible for food-borne illness must also seek to ascertain other aspects of virulence, pathogenicity, biochemistry of toxin production, ecology, or genetics in addition to the enumeration of incidence, pathogen load, or frequency.
- Research proposed to examine antibiotic resistance mechanisms must include a direct connection to food safety. Studies which focus on an examination of molecular mechanisms or incidence of antibiotic resistance within populations will not be considered for funding unless they consider aspects of antibiotic resistance associated with increased probability of food-borne illness (e.g. colonization potential, increased pathogen load, persistence, and viability). Antibiotic resistance as it relates to therapeutic treatment of humans or the etiology of pathogenesis will not be considered within this program.
- Applications that contain hypothesis driven mitigating, reducing, or managing the offending agent or disease causing entity or in providing a greater understanding of the routes of food contamination, environmental persistence, and the biology of the offending agent. Research aimed solely at development of a detection methodology will not be considered for review. Applicants are encouraged to speak with the National Program Leader before submission of applications regarding detection methodologies. Coordinating the proposed study with the appropriate industry is highly recommended.
- Applications may be structured from a pre-harvest or post-harvest approach as appropriate. Economic or model-based analyses of these priority areas will also be considered for review, especially if they address issues of regulatory burden and impacts on trade.
- Applications dealing with food processing techniques or the utilization and production of foods designed to improve food quality should consider submission to the Improving Food Quality and Value program. Food safety applications examining the epidemiological aspects of microbes associated with food-borne illness should consider submission to the Epidemiological Approaches for Food Safety program.
- Applications that do not address at least one of the stated research program priorities will not be reviewed.
- If a project is funded, beginning in the first year of funding, the project director will be required to attend annual investigator meetings. Reasonable travel expenses should be included as part of the project budget.

2. Food Safety and Epidemiology: Epidemiological Approaches for Food Safety Solutions

Program Code - 93232

National Program Leader – Dr. Nancy Cavallaro (202-401-4082 or ncavallaro@csrees.usda.gov)

Total Program Funds – approximately \$4.5 million

Proposed Budget Requests –

- Proposed integrated project budget requests must not exceed \$1.25 million for project period of 3-4 years (including indirect costs).
- Requests exceeding the budgetary guideline above will be returned without review.

Letter of Intent – March 4, 2009 (5:00 P.M., ET); Part II, F for format and submission instructions.

Anticipated Application Deadline – May 6, 2009 (5:00 P.M., ET); the firm deadline will be made available in the AFRI RFA.

Background

Epidemiological studies are necessary to develop an understanding of the factors involved in food safety, provide the science-based data for policy decisions, and develop intervention and outreach programs. Epidemiological studies of pre- and post-harvest areas are vital to identify and characterize pathogenic organisms, including their sources and reservoirs, and to understand the transmission of the pathogen along the entire continuum. Environmental and ecological data are needed to increase our understanding of disease-causing microorganisms, their products, and naturally occurring contaminants in meats, poultry, seafood, and fresh fruits and vegetables. Understanding the distribution and determinants of disease and health-related events in a population should be used for prevention and control. Projects should focus on interactions among the environment, agriculture, and human populations with the goal of decreasing food-borne disease, as well as antimicrobial resistance.

The long term goals (10-year) for this program include enhancing the epidemiologic methods available for the study of food-borne diseases and other public health issues, advancing the understanding of the epidemiology of food-borne disease and the food system on a continuum, and using this new information to develop and evaluate specific intervention strategies/prevention and control programs for food-borne disease and antimicrobial resistance.

FY 2009 Priorities for Integrated Projects – Applicants must address at least one of the following priorities.

1. Development of novel epidemiologic approaches that include evaluation of the impact of intervention or management strategies on microbial contamination or food safety. These may include epidemiological methods that will facilitate the understanding of quantitative data on pathogen load within the farm-to-fork continuum, facilitate the linking of pre-harvest and post-harvest food safety outcomes to public health outcomes, and/or identify new risk factors.
2. Innovative studies which seek to quantify the effectiveness of existing interventions or management strategies in reducing pathogen loads across farm-to-fork. Projects addressing this priority must also apply the finding by developing outreach programs to appropriate audiences.

Other Key Information

- A letter of intent is required for this program. The letter of intent deadline is **March 4, 2009, by 5:00 P.M., Eastern Time**. Format and content for the letter of intent can be found in Part II, F.
- **This is an integrated program. Please refer to Part III, A for eligibility criteria.**
- Project proposals must include at least two of the three components of the agricultural knowledge system (i.e., research, education, and extension). Each component should be represented by one or more objectives within the proposal. Projects must budget sufficient resources to carry out the proposed set of research, extension and/or education activities, with **no more than two-thirds** of a project's budget being allocated to a single knowledge area. Please see Part II.C.2 for a full listing of integrated project requirements, which should be followed closely to ensure success in the peer review process.

- Please see Part IV, A for the criteria that will be used to evaluate integrated proposals. Applicants are also encouraged to see <http://www.csrees.usda.gov/funding/integrated/integrated> for an example of an integrated proposal and other grant-writing resources.
- Applications must include the elements of a logic model detailing the activities, outputs, and outcomes of the proposed project. This information may be provided as a narrative or formatted into a logic model chart. The logic model planning process is a tool that should be used to develop your project **before** writing your proposal. Two additional pages are allowed for this information. More information and resources related to the logic model planning process are provided at http://www.csrees.usda.gov/funding/integrated/integrated_logic_model.html.
- The AFRI encourages integrated projects that develop content suitable for delivery through eXtension. This content is for “end users” as opposed to staff development and must align with the eXtension Guiding Principles, Implementation Plan and other requirements as presented at <http://about.extension.org/university-researcher/>. Funds may be used to contribute to an existing Community of Practice or to form a new Community of Practice as appropriate.
- The AFRI encourages integrated projects that lead to measurable, documented changes in learning, actions or conditions in Family and Consumer Sciences disciplines and/or projects suitable for 4-H audiences and stakeholder groups while meeting identified program priorities. 4-H projects should align with 4-H Mission mandates of Science, Engineering, Technology, Healthy Living or Citizenship. See guiding principles at <http://www.national4-hheadquarters.gov/> <<http://www.national4-hheadquarters.gov/>> or contact your university Cooperative Extension headquarters or Family and Consumer Sciences State Leaders.
- Near term goals that will help fulfill the long term goals include: 1) emphasizing new innovative epidemiologic and statistical methodology; 2) emphasizing intervention and outreach projects and discouraging simple prevalence studies; and 3) emphasizing potential projects/methodologies for emerging issues in food safety and public health, including food biosecurity and antimicrobial resistance.
- Proposals should involve collaboration with institutions, organizations, and communities of interest. Strong partnerships are required, such as those that form consortiums or collaborative networks. Innovative multidisciplinary collaborations and partnerships are those designed to build solutions to understanding the interrelationships of the various factors that affect the safety of our food supply. Applicants must combine the knowledge of multiple disciplines (i.e. veterinarians, food microbiologists, epidemiologists, public health specialists, or other scientific disciplines) in the proposal. Engagement with partners and stakeholders is required to solve these complex problems.
- Applications must have a primary focus on epidemiological studies and develop and assess novel outreach components. The applications must have an epidemiologist and extension personnel as Project director or co-project director.
- Applications concentrating on laboratory methods or techniques prevalence studies or studies that have already been done, pure risk assessment methodologies or modeling studies, and surveillance studies without additional components are **NOT** eligible.
- Applications that do not address at least one of the stated program priorities will be returned without review.
- If a project is funded, beginning in the first year of funding, the project director will be required to attend annual investigator meetings. Reasonable travel expenses should be included as part of the project budget.

3. Food Safety and Epidemiology: Practical Approaches for Food Protection

Program Code - 93233

National Program Leader – Dr. Nancy Cavallaro (202-401-4082 or ncavallaro@csrees.usda.gov)

Total Program Funds – approximately \$1.4 million, of which \$900,000 will be provided by the Food and Drug Administration (FDA)

Proposed Budget Requests –

- Proposed research project budget requests must not exceed \$300,000 for project period of 2-3 years (including indirect costs).
- Requests exceeding the budgetary guidelines above will not be reviewed.

Letter of Intent Deadline – March 4, 2009 (5:00 P.M., ET); Part II, F for format and submission instructions

Anticipated Application Deadline – May 6, 2009 (5:00 P.M., ET); the firm deadline will be made available in the AFRI RFA.

Background

This program element is in partnership with the Food and Drug Administration (FDA), at the U.S. Department of Health and Human Services. FDA is committed to reducing the incidence of food-borne illness to the greatest extent possible, and to protecting the integrity of the nation's food supply. CSREES and FDA support research that includes, but is not limited to: 1) improving the detection and quantification of food-borne contaminants (pathogens, toxins, and chemicals) that could jeopardize the safety and security of the food supply; 2) finding new and improved ways to control food-borne contaminants; and 3) safely producing, processing and handling food and food products. These research activities often provide information critical to food safety guidance and policymaking.

The FDA Center for Food Safety and Applied Nutrition (CFSAN) focuses specifically on programs, activities, and resources that promote food protection. In an effort to expand the scope of this program, CSREES and FDA are initiating a collaborative, interagency research program targeted to two specific food protection priorities.

FY 2009 Priorities for Research Projects – Applicants must address at least one of the following priorities.

1. Studies to integrate food system signals with geospatial or other innovative technologies that may indicate contamination leading to a food-borne outbreak associated with fresh produce (leafy greens; tomatoes; or melons). Food system signals include but are not limited to problems identified through routine testing or clusters of illnesses reported by government authorities. Geospatial technologies include a range of tools that allow the mapping and analysis of data derived from natural resource information such as climate and environmental monitoring to predict a future event.
2. Studies to develop and validate methods and/or processes for sampling plans for produce and environmental samples. The sampling plans should include how to interpret the data from studies with a large number of samples with very few positive results and should assist in validating the metrics used in Good Agricultural Practices (GAPs). Positive results are the presence of microbial or chemical contaminants in produce and environmental samples.

Other Key Information

- A letter of intent is required for this program. The letter of intent deadline is **March 4, 2009, by 5:00 P.M., Eastern Time**. Format and content for the letter of intent can be found in Part II, F.
- **This is a non-integrated program. Please refer to Part III, A for eligibility criteria.**
- Applications that do not address at least one of the stated research program priorities will not be reviewed.
- If a project is funded, beginning in the first year of funding, the project director will be required to attend annual investigator meetings. Reasonable travel expenses should be included as part of the project budget.

c. Human Nutrition and Obesity

Program Code - 93330

National Program Leaders –

Dr. Etta Saltos (202-401-5178 or esaltos@csrees.usda.gov)

Dr. Susan Welsh (202-720-5544 or swelsh@csrees.usda.gov)

Total Program Funds – approximately \$11 million, with \$10 million for integrated projects and \$1million for extension projects

Proposed Budget Requests –

- Proposed integrated project budget requests must not exceed \$1,500,000 for project period of 2-4 years (including indirect costs).
- Proposed extension project budget requests must not exceed \$500,000 for project period of 2-4 years (including indirect costs).
- Requests exceeding the budgetary guideline above will be returned without review.

Letter of Intent Deadline – Not required for this program.

Anticipated Application Deadline – June 15, 2009 (5:00 P.M. ET); the firm deadline will be made available in the AFRI RFA.

Background

This crosscutting program addresses the complex problem of obesity prevention. Projects funded by this program should lead to the development and evaluation of effective programs to prevent obesity. Obesity is the number one nutritional problem in America. Food is an integral part of the process that leads to obesity and USDA has a unique responsibility for the food system in the United States.

To meet the identified needs of agriculture, the long-term (10-year) goals for this program include identifying the behavioral factors that influence obesity to develop effective obesity prevention strategies; developing valid behavioral and environmental instruments for measuring progress in obesity prevention efforts; and promoting effective strategies for preventing overweight and obesity. The ultimate goal of the program is to stem the rising tide of obesity.

The milestones toward reaching these long-term goals include developing theories on how behavioral factors influence obesity; testing validity of behavioral measures for evaluating progress in obesity prevention efforts; and testing the effectiveness of strategies for preventing overweight and obesity.

FY 2009 Priority for Integrated Projects – Applicants must address the following priorities.

1. Improve understanding of the behavioral (not metabolic) factors that influence obesity. Additionally, use this new information to develop effective programs for *preventing* overweight and obesity or to help prepare the next generation of researchers and educators to address the complex problem of obesity. Potential study areas for factors influencing obesity may include social and psychological factors, the role of lifestyle, including physical activity, as well as the influence of family, peers, and community, the influence of economic factors, and agricultural and public policy issues. Because food is an integral part of the development of obesity, all projects should address some aspect of food from production to consumption.
2. Develop and implement behavioral and environmental instruments to measure progress in obesity prevention efforts, for example, develop impact indicators for Cooperative Extension System education programs. This activity may necessitate the development of new instruments or the modification and validation of existing ones.

Other Key Information

- Project proposals must include at least two of the three components of the agricultural knowledge system (i.e., research, education, and extension). Each component should be represented by one or more objectives within the proposal. Projects must budget sufficient resources to carry out the proposed set of research,

extension and/or education activities, with **no more than two-thirds** of a project's budget being allocated to a single knowledge area. Please see Part II.C.2 for a full listing of integrated project requirements, which should be followed closely to ensure success in the peer review process.

- **This is an integrated program. Please refer to Part III, A for eligibility criteria.**
- Please see Part IV, A. for the criteria that will be used to evaluate integrated proposals. Applicants are also encouraged to see <http://www.csrees.usda.gov/funding/integrated/integrated> for an example of an integrated proposal and other grant-writing resources.
- Applications must include the elements of a logic model detailing the activities, outputs, and outcomes of the proposed project. This information may be provided as a narrative or formatted into a logic model chart. The logic model planning process is a tool that should be used to develop your project **before** writing your proposal. Two additional pages are allowed for this information. More information and resources related to the logic model planning process are provided at http://www.csrees.usda.gov/funding/integrated/integrated_logic_model.html.
- The AFRI encourages integrated projects that develop content suitable for delivery through eXtension. This content is for “end users” as opposed to staff development and must align with the eXtension Guiding Principles, Implementation Plan and other requirements as presented at <http://about.extension.org/university-researcher/>. Funds may be used to contribute to an existing Community of Practice or to form a new Community of Practice as appropriate.
- The AFRI encourages integrated projects that lead to measurable, documented changes in learning, actions or conditions in Family and Consumer Sciences disciplines and/or projects suitable for 4-H audiences and stakeholder groups while meeting identified program priorities. 4-H projects should align with 4-H Mission mandates of Science, Engineering, Technology, Healthy Living or Citizenship. See guiding principles at <http://www.national4-hheadquarters.gov/> <<http://www.national4-hheadquarters.gov/>> or contact your university Cooperative Extension headquarters or Family and Consumer Sciences State Leaders.
- High priority will be given to projects involving population groups at risk for obesity, such as those served by USDA programs (e.g., Expanded Food and Nutrition Education program, Cooperative Extension, nutrition assistance programs). The rationale for the selection of any population for study or intervention should be documented.
- Because obesity is such a multifaceted problem, it is expected that the project team will have appropriate training and experience in multiple disciplines, *especially nutrition*.
- Applications that focus primarily on weight loss, medical therapies for disease or metabolic aspects of diet and energy balance should **not** be submitted to this program.
- Applications that do not address at least one of the stated program priorities will be returned without review.
- If a project is funded, beginning in the first year of funding, the project director will be required to attend annual investigator meetings. Reasonable travel expenses should be included as part of the project budget.

FY 2009 Priority for Extension Projects – Applicants must address the following priority

1. Expand and disseminate results of intervention projects which have demonstrated success in obesity prevention. This may include development of toolkits, demonstration projects and eXtension Communities of Practice.

Other Key Information for Extension Projects

- **This is an integrated program.** Please refer to Part III, A for eligibility criteria.
- Please see Part IV, A. for the criteria that will be used to evaluate proposals.
- Applications must include the elements of a logic model detailing the activities, outputs, and outcomes of the proposed project. This information may be provided as a narrative or formatted into a logic model chart. The logic model planning process is a tool that should be used to develop your project **before** writing your proposal. Two additional pages are allowed for this information. More information and resources related to the logic model planning process are provided at http://www.csrees.usda.gov/funding/integrated/integrated_logic_model.html.
- The AFRI encourages projects that develop content suitable for delivery through eXtension. This content is for “end users” as opposed to staff development and must align with the eXtension Guiding Principles, Implementation Plan and other requirements as presented at <http://about.extension.org/university-researcher/>. Funds may be used to contribute to an existing Community of Practice or to form a new Community of Practice as appropriate.
- The AFRI encourages integrated projects that lead to measurable, documented changes in learning, actions or conditions in Family and Consumer Sciences disciplines and/or projects suitable for 4-H audiences and stakeholder groups while meeting identified program priorities. 4-H projects should align with 4-H Mission mandates of Science, Engineering, Technology, Healthy Living or Citizenship. See guiding principles at <http://www.national4-hheadquarters.gov/> <<http://www.national4-hheadquarters.gov/>> or contact your university Cooperative Extension headquarters or Family and Consumer Sciences State Leaders.
- If a project is funded, beginning in the first year of funding, the project director will be required to attend annual investigator meetings. Reasonable travel expenses should be included as part of the project budget.

d. Improving Food Quality and Value

Program Code - 93430

National Program Leader –

Dr. Ram Rao (202-401-6010 or r Rao@csrees.usda.gov)

Dr. Dionne Toombs (202-401-2138 or dtoombs@csrees.usda.gov)

Dr. Hongda Chen (202-401-6497 or hchen@csrees.usda.gov)

Total Program Funds – approximately \$ 6.5 million

Proposed Budget Requests –

- Proposed research project budget requests must not exceed \$ 500,000 for project period of 2-4 years (including indirect costs) for multidisciplinary projects involving more than one investigator
- Proposed research project budget request must not exceed \$ 300,000 for project period of 2-4 years for single investigator-led projects
- Requests exceeding the budgetary guidelines above will not be reviewed.

Letter of Intent Deadline – January 21, 2009 (5:00 P.M., ET); see Part II, F for format and submission instructions.

Anticipated Application Deadline – **March 31, 2009** (5:00 P.M., ET); the firm deadline will be made available in the AFRI RFA.

Background

Improving food quality and value is driven by the application of physical, chemical, and biological principles and is essential in meeting the needs of the consumer, as well as enhancing competitiveness in global markets.

The long term goals (10-year) of this program are to formulate ingredients based on the knowledge of chemical and physical interactions for better functionality of foods; develop new and improved technologies to produce better foods; and produce foods to promote optimum health of individual citizens.

FY 2009 Priorities for Research Projects – Applicants must address at least one of the following priorities.

1. Basic mechanisms involved in the interaction of micro- and macro-molecules in the food matrix in controlling structure, texture, stability, and flavor delivery in foods. This includes (a) the fundamental understanding of the mechanism of interaction of proteins, polysaccharides, and lipids in foods (e.g. covalent, ionic, hydrophilic, and hydrophobic structures and kinetics) and (b) factors influencing the complexation and segregation of these macromolecules (e.g. processing environment, storage conditions, other food ingredients), and the resultant quality of foods (such as predictive modeling and food product quality).
2. Generating the knowledge base for advanced and innovative processing, engineering, and technologies that enhance food quality attributes and development and application of analytical characterization techniques of physical, chemical, biological, and sensory natures.
3. Physico-chemical characteristics and bioavailability of proven bioactive health components during conversion of raw ingredients into foods (food processing, packaging, distribution, storage, and consumption) and development of relevant food technologies to enhance the stability, bioavailability, and targeted delivery of bioactive components.

Other Key Information

- A letter of intent is required for this program. The letter of intent deadline is **January 21, 2009 by 5:00 P.M., Eastern Time**. See Part II, F for format and submission instructions.
- **This is a non-integrated program. Please refer to Part III, A for eligibility criteria.**
- For priority 3, applications that foster collaborations between nutrition scientists and food scientists are encouraged as long as they are clearly oriented toward foods for health. Applications dealing solely with bioavailability, efficacy and safety should consider submission to the Bioactive Food Components.
- Proposals addressing food components with equivocal or no evidence of bioactivity and building databases will not be considered.
- Improving Food Quality and Value program funds applications in the post harvest area only.
- Multi-disciplinary approaches are highly encouraged. Proposals should include at least two disciplines related to food science (chemistry, biochemistry/biology, physics, engineering/processing, microbiology, biometry, sensory science, and nutrition).
- Applications addressing combined and inseparable quality and safety objectives will be entertained in this program. However, applications dealing primarily with issues of food safety should consider submission to the Food Safety and Epidemiology program. Applications dealing solely with bioavailability, metabolism, and mechanism of action of bioactive food components should be sent to the Bioactive Food Components for Optimal Health program. For proposals addressing both Food Science and Nutrition, check priority # 2.
- Applications that do not address at least one of the stated research program priorities will not be reviewed.
- If a project is funded, beginning in the first year of funding, the project director will be required to attend annual investigator meetings. Reasonable travel expenses should be included as part of the project budget.