

## Stakeholder Feedback for the AFRI Food Safety Challenge Area

### AFRI Stakeholder Input

The programs described herein were developed within the context of the authorized purposes of U.S. Department of Agriculture (USDA) research, Extension, and education projects and activities. In addition, the Agriculture and Food Research Initiative (AFRI) obtains input from Congress; the National Agricultural Research, Extension, Education, and Economics Advisory Board (NAREEEAB); and many university, scientific, and agricultural committees and organizations. The National Institute of Food and Agriculture (NIFA) developed a stakeholder's Web page ([www.nifa.usda.gov/business/reporting/stakeholder.html](http://www.nifa.usda.gov/business/reporting/stakeholder.html)) to document stakeholder input that is considered when developing and updating program area descriptions and priorities each year.

Stakeholders expressed considerable support for the program area on “Enhancing Food Safety through Improved Processing Technologies.” They commended the program goal, as stated in the Request for Applications (RFA) “The goal of this integrated program is to further develop, and promote the use of, innovative and sustainable food processing technologies that improve food safety, and simultaneously retain or enhance food quality or nutritional value.” Some of the specific requirements distinguished this program from regular single investigator research approaches. Unique requirements of this program area include:

- Processing technologies may broadly include thermal, minimally-thermal or non-thermal processes. Adaptability and suitability for commercial and institutional applications should be evaluated.
- Multidisciplinary approaches are encouraged and project teams should consider including experts in food science and technology, food engineering, microbiology, chemistry, food and nutrition, food safety and quality evaluation, program performance evaluation, economics, and behavioral and social sciences, among others.
- Public-private partnerships among those from academia, government, the food industry, and others are strongly encouraged. Leading academic and industry experts in the processing technologies addressed must be included in these collaborative partnerships and/or consortia.
- Involvement from those representing allied industries - such as equipment design, automation and control, and others – is encouraged from concept development, to technology development, to validation of technology, and to assessment of adaptability/suitability for commercial success.
- Where appropriate, project teams should consult with food safety regulatory agencies including the U.S. Food and Drug Administration (FDA), USDA Food Safety Inspection Service, etc., and with other government agencies involved in technology development Department of Defense, Natick Soldier Research Development and Engineering Center, National Aeronautics and Space Administration, National Science Foundation, etc.

Stakeholders made the following additional suggestions for the Food Safety program:

- Future RFAs might include some instructions to more concisely define the nature and extent of the problem being addressed along with the intended pathway to solution. This

- will help the streamline the panel review process, and also likely to increase success rate.
- The project timeline, management plans and budget justification in an application should follow in a clear fashion. The current format does have some of these critical elements separated by many pages of detailed budgetary information to complicate the job of the reviewers.
  - More defined guidance should be given up front for both investigators and reviewers, especially in the area of Extension, which needs to include the specific target groups who would use the new technologies.
  - It is recognized that successful projects should include some demonstration of the application of the new technical solutions to foods at a scale above the lab bench used to study mechanisms of inactivation. Pilot plant operations could be used to develop validation plans for the process and to provide data based on operating costs as well as providing real data to support claims of improved sustainability plus templates for validation plans for full scale operations after industry could see the value of the process with tangible examples of foods processed by the new technologies in demonstration centers.
  - It was suggested to weight the research, education, and Extension elements according to the program needs, for example, 50% research, 30% Extension and 20% education.

Stakeholders generally were very supportive of the breadth of topic areas of the Antimicrobial Resistance (AMR) program that provided numerous opportunities for various disciplinary teams of scientists to apply. NIFA was complimented on its strategy of using systems approaches at the ecosystem level, from farm to fork, in addressing the complex issue of AMR while also emphasizing Extension-outreach and education. NIFA's approach supports USDA-wide programs, as reflected in the Combating Antimicrobial Resistant Bacteria (CARB) National Action Plan, the USDA AMR Action Plan and the CARB Strategic Plan. Stakeholders wanted to be able to collaborate with their international colleagues and want to see a focus on the environment (the March 2016 President's Advisory Council on CARB Report stresses the apparent failure to address this particular issue in the overall government-wide AMR programs). Other recommendations included: 1) the need for basic (foundational) research; 2) education and training of larger number of Veterinary Science students; 3) development of rapid diagnostic tools; 4) rapid identification tools and techniques; 5) the role of the microbiome (including gastrointestinal microbiome) and other microbes (including commensals) on spread, fate, transport, and disease development and transmission; 6) characterization of transmission of disease, antimicrobial-resistant microbes, and antimicrobial resistant genes between animals and humans.

Food safety hazards of most concern to stakeholders included Shiga toxin-producing *Escherichia coli* (STEC), *Listeria monocytogenes*, *Salmonella*, *Campylobacter* and the parasite *Toxoplasma*. Chemical and physical hazards are also of concern, including nanoparticles. Foods of concern include raw and processed meat and poultry, fresh produce, processed dairy products and seafood. Support was expressed for funding for research, education and Extension activities on epidemiology of foodborne diseases, food safety risk assessments, better detection methods for pathogens and contaminants, control strategies for preventing foodborne illnesses, better methods for attribution of foodborne illnesses to specific foods, microbial ecology of foodborne

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pathogens and antimicrobial resistance.

NIFA recognized the advantages and disadvantages of being specific on threat organisms and/or technologies, and accordingly determining the breadth of the priorities in the RFA as it sees fit. For example, the 2010 Food Safety Challenge Area RFA was focused on STEC and virus. Because NIFA staff prepare RFAs annually, this recommendation will be considered in future RFA development. Applications to AFRI have a standard format used across all AFRI programs. Suggestions to improve the format is being assessed by NIFA leadership. NIFA will consider adding explanation of the Extension activities needed for success of major projects (e.g., Coordinated Agricultural Project grants) and how to measure the effectiveness of the chosen strategy. It was recognized that successful projects should include some demonstration of the application of the new technical solutions to foods at a scale above the laboratory bench used to study mechanisms of inactivation. Pilot plant operations could be used to develop validation plans for the process and to provide data based on operating costs as well as providing real data to support claims of improved sustainability plus templates for validation plans for full scale operations after industry could see the value of the process with tangible examples of foods processed by the new technologies in demonstration centers. It was the intent of the program from the first year (2010) and onwards to develop, validate, and demonstrate the applications of the new technologies at pilot plant scale to allow food processors to assess the value of the processes. Submitting applications under the center of excellence provision of the 2014 Farm Bill may be a mechanism to reinforce this intention. The program funded a new grant as a COE in 2015, and will evaluate its success in this consideration. Defining the distributed weight among research, education and Extension in integrated project grant applications may be a good idea for consideration.

The AMR program area was written to reflect comments from our stakeholders at all levels, as evident from the systems approach that cuts across disciplines and integration is required for only two, and not all three components (i.e., research, education and Extension) of the agricultural knowledge system. Therefore, applicants who are not as savvy with the Extension component, for example, can address research and education. To avoid redundancy and duplication of efforts in the AMR arena, a team-based project that includes a broad array of collaborations at the international and domestic level is encouraged. Another unique suggestion is for applicants to leverage data and knowledge generated from other sources including on-going Federal activities such as the National Animal Health Monitoring System (<http://www.aphis.usda.gov/wps/portal/aphis/ourfocus/animalhealth>) and the Antibacterial Resistance Leadership Group (<http://arlg.org/about-the-arlg>) rather than repeat studies in order to gather the same information. AMR is a complex and global issue, and NIFA's program reflects and values the input and feedback of our stakeholders.

Research on detecting and controlling various pathogens was included in the RFA. Researchers responded and work was funded. This has improved our understanding of these pathogens and should result in a safer food supply.

#### **Sources of Stakeholder Input\*:**

- Reports of the Panel Managers for AFRI programs related to Food Safety through. Recommendations in these reports also reflect inputs from panels of diverse and relevant

scientific backgrounds in research, education and Extension from academia, industry and government agencies.

- The President's Advisory Council on CARB, including a public meeting in March, 2016.
- The Atlantic's Resistance: The Antibiotic Challenge, March, 2016.
- Research Gap Analysis Workshop: Alternatives to Antibiotics, April, 2016.
- USDA Interagency Working Group on AMR-CARB.
- IFSN/IFPS organized Seminar: "Environmental impacts of antibiotic use in livestock with global implications & intervention strategies", Washington State University, April, 2016.
- Livestock and Poultry Environmental Learning Center webinar: Antibiotic Resistance and Animal Agriculture, March, 2016.
- Tri-Societies of America (Agronomy Society of America, Soil Science of America, and Crop Science Society of America) "Synergy in Science: Partnering for Solutions" Symposium - Soils as the New Frontier in Antibiotic and Antibiotic Resistance Discovery, November, 2015.
- Farm Foundation Forum: Antibiotic use in Humans and Animals, January, 2016.
- USDA AMR Strategic Planning Meeting that included the U.S. FDA, National Institutes of Health, and Centers for Disease Control and Prevention, January, 2016.
- Individuals and small groups from various universities including 1890 and 1862 land grant institutions, non-land grant universities, and the public and private sectors.
- U.S. Centers for Disease Control and Prevention.
- Strategic Plan of the USDA Research, Education and Economics Mission Area.
- NIFA Strategic Plan.
- Roundtable Discussion at Institute of Food Technologists Meeting, 2014.
- Council of Food Science Administrators bi-annual meeting 2014-2015.
- Institute of Food Technologists Annual Meeting: Government Funding Liaison Listening Session Panel, 2015.
- Hawaii Institute of Food Technologists and University of Hawaii (Manoa) Human Nutrition, Food and Animal Sciences Faculty Listening Session and Roundtable.
- University of Alaska (Fairbanks) and Alaska Cooperative Extension, Department of Natural Resources Listening Session.

\*Sources include participants from the private and public sectors, institutions of higher education, consumers, and non-governmental organizations.

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