



United States Department of Agriculture
National Institute of Food and Agriculture

TACTICAL SCIENCE: CONTINUING THE COMMITMENT

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ABSTRACT: A well-designed agricultural biosecurity system is supported by resource management, relevant research, balanced regulations, and effective relationships among scientific experts, policy-makers, and consumers. It requires a concerted effort, sustained investment, and a coordinated strategy to face the vulnerabilities of our nation’s food and agricultural system. The National Institute of Food and Agriculture (NIFA) is committed to strengthening agricultural biosecurity through its tactical sciences portfolio – a complementary set of programs that offers tools to protect the integrity, reliability, sustainability, and profitability of the U.S. food and agriculture system against threats from pests, diseases, contaminants, and disasters. Given the emerging threats, trends, and forces that may influence the American food system enterprise, NIFA and the College of Agriculture and Natural Resources, University of Maryland, College Park (UMD) invited a group of key stakeholders to identify critical priorities and develop a coordinated framework of tactical science capabilities. The stakeholders concluded that success of NIFA’s tactical science programs will require collaborations, continued commitment, and inclusion of stakeholder and consumer needs, along with increased investment in tactical sciences to protect the biosecurity of the agricultural sector.

INTRODUCTION

In 2015, the agriculture industry contributed about \$992 billion to U.S. GDP and supported about 11% of the total U.S. employment ([ERS report](#)). Therefore, any major agricultural catastrophe would lead to a significant loss of jobs, income, national food supply, and trade. With the burgeoning global population and the resultant pressure to produce more food without a commensurate increase in natural resources ([UN 2015 Population Report](#)), the biosecurity of America’s food and agricultural system is of utmost priority. Vulnerability of the U.S. food and agriculture sector to biological agents, whether occurring naturally or accidentally, or introduced deliberately, and the urgent need for increased protection against these agents were recognized by a 2015 bipartisan [Blue Ribbon Study Panel on Biodefense \(A National Blueprint for Biodefense: Leadership and Major Reform Needed to Optimize Efforts\)](#).

Food insecurity can have profound effects on national stability and security, as demonstrated over the past decade in the Middle East and Africa. The imbalance of supply and demand for food can happen anywhere and, as stated by former Sen. Tom Daschle and retired Air Force general Richard B. Myers, “no country is immune” ([A Threat to the Food System](#)). Without increased efforts to safe-guard major agricultural systems from threats, the issue of food insecurity will unfortunately become increasingly common in different regions of the world.

Section I of the April 2017 Presidential executive order on Promoting Agriculture and Rural Prosperity ([The Press Office](#)) is consistent with the findings of the 2015 Blue Ribbon panel, stating that “A reliable,

safe, and affordable food, fiber, and forestry supply is critical to America's national security, stability, and prosperity". The Order established an Interagency Task Force on Agriculture and Rural Prosperity, chaired by Agriculture Secretary Sonny Perdue, to identify legislative, regulatory, and policy changes to promote economic prosperity and quality of life in rural America. Commenting on this executive order, Ray Starling, the Special Assistant to the President for Agriculture, Trade, and Food Assistance, cited four Administration priorities: (1) increasing agricultural trade, (2) examining labor issues, (3) identifying regulatory policy challenges for agriculture, and (4) ensuring agriculture participates in America's infrastructure enhancement.¹

The increasing biosecurity risks to U.S. agriculture and the critical role of agriculture for American prosperity, necessitate a strong tactical science portfolio to protect our nation's food and agricultural systems. Tactical sciences refer to a complementary set of programs that offers tools to protect the integrity, reliability, sustainability, and profitability of the U.S. food and agricultural system against biosecurity threats from pests, diseases, contaminants, and disasters. NIFA's tactical science portfolio consists of disparate grant programs that support the development of tools, methods, and networks for surveillance, protection, production, response, and recovery. Current NIFA tactical science programs include:

- National Plant Diagnostic Network (NPDN)
- National Animal Health Laboratory Network (NAHLN)
- Extension Disaster Education Network (EDEN)
- Crop Protection and Pest Management (CPPM)
- Minor Crop Pest Management (IR-4)
- Food Animal Residue Analysis Database (FARAD)
- Minor Use Animal Drugs Program (MUADP)

Historically, each of these programs has functioned independently and programming and resource development has been completed by institutional representatives within each network. Federal support has been essential for each of these programs to expand their scope and become a national resource, and federal support is critical to enable these networks to continue operating at current levels. Because of the need to protect against the ever-growing threats to the U.S. food and agricultural system, a significant increase in the capacity of these networks is warranted. The value and importance of U.S. agricultural goods and services to our nation's prosperity will be largely impossible to protect without a coordinated approach and additional, commensurate funding.

METHODOLOGY

In response to these challenges and urgent needs, NIFA and UMD hosted "Calls to Conversation" aimed at working with stakeholders to develop a shared vision and identify opportunities to enhance NIFA's tactical science portfolio. A series of questions and exercises were facilitated to solicit input and

¹ Comments at the second NIFA-UMD Call to Conversation, February 16, 2017.

encourage discussions. Each participant highlighted areas of strength and opportunities, and collected responses were categorized into major themes.

At the first conversation, more than 75 NIFA partners and stakeholders, representing agricultural interests, commodity groups and grower associations, federal agencies, and academic scientists and extension personnel from across the nation (see Appendix A) considered the following issues:

- Economic, political, social, technological, and scientific trends/forces that will impact the security of the American food system enterprise in the next 10 years;
- Strengths and weaknesses of current tactical science efforts, and opportunities for improvement; and
- Principles and characteristics for a future successful tactical science effort

Participants provided diverse perspectives agreed that an increase in coordinated support is required to close current gaps and address future tactical science needs.²

A smaller working group of partners and stakeholders was convened to continue the discussion during the second conversation (see Appendix A). With the overall goal of increasing the capacity to protect the biosecurity of our nation's food and agriculture system, discussions centered on identifying programmatic and organizational needs and re-aligning or re-designing the current tactical science portfolio to better address current and emerging challenges. The participants were asked to:

- Summarize the major key points from the previous conversation;
- Provide recommendations to create a set of aspirational outcomes; and
- Develop a communication strategy to effectively convey the importance of tactical sciences to relevant audiences.

CURRENT STRENGTHS AND GAPS, AND DESIRABLE OUTCOMES

When asked to identify major forces that will impact the biosecurity of the American food system, participants mentioned a variety of topics including:

- Agricultural trade and globalization,
- Spontaneous outbreaks of emerging and re-emerging diseases
- Public perceptions, and
- Budget pressures

The group voiced the pressing need for collaboration and effective communication among stakeholders and across administrative and disciplinary silos to create a unified message to convey the need to strengthen national tactical science capabilities.

² A detailed report of the first Call to Conversation on Tactical Sciences is available at <https://nifa.usda.gov/resource/biosecurity-protect-americas-food-and-agricultural-system>

Participants reflected on the strengths and accomplishments of existing programs, and shared that the existing diagnostic capabilities were a major national asset. The ability to respond rapidly to emergencies effectively and efficiently even with the current limited resources was highlighted. The working group also noted that some of the existing collaborations, established policies, and general success in ensuring food quality and trade were worthy of acknowledgment.

The group expressed the value and need for an effective champion to provide leadership across the various silos and make strategic decisions that are not based solely on requirements of any individual group. Participants agreed that the existence of silos creates barriers to sharing expertise between organizations, leveraging limited resources, and ultimately, having a unified message to communicate priorities and the importance and impacts of tactical sciences to other relevant stakeholders and the public. In addition, participants shared strong concern regarding the dwindling human and physical capital needed to implement tactical science efforts, specifying the need for both highly skilled and trained professionals and adequate infrastructure.

Within a strengthened tactical science initiative, participants said the desired outcomes would be an (1) updated infrastructure, (2) an open and profitable export market where U.S. products are the preferred choice and threats that impact our ability to export products could be mitigated, (3) a stable and increased production capacity with the highest quality products, (4) the safest, most abundant, and most diverse domestic food supply, (5) consumer acceptance of technology, and (6) a structure that promotes engaged partnerships and streamlined processes.

VITAL COMPONENTS FOR A SUCCESSFUL STRUCTURE

After analyzing the strengths and gaps of the current system, and prioritizing “what” was needed, meeting participants were asked “how” these outcomes could be achieved.

It was established that a successful tactical science initiative will require a sustained effort from all stakeholders and, therefore, must be premised on four foundational principles: (1) efficiency, (2) effectiveness, (3) accountability, and (4) relationships/trust. Meeting participants identified the key elements of these principles as follows:

EFFICIENCY

How do we achieve and maintain these deliverables/outcomes in the most productive way?

- **Automation/Technology** | Obtain state-of-the-art technology with the proper capacity to respond, manage, and recover from anticipated threats
- **Regulatory** | Streamline regulatory support processes to reduce the lag on response decisions and limitations on production
- **Capital investment** | Evaluate the needs to make cost-effective investments and produce cost-effective systems
- **Collaborations** | Expand network to create shared goals, increase transparency, and leverage resources

- **Standards and metrics** | Establish standardized policies, procedures, and evaluations of the system and employees

EFFECTIVENESS

What are the required components to successfully deliver what is needed?

- **Communication** | Build a two-way communication mechanism to invite stakeholder involvement. Communicate within our groups and to our audience to share any successes, anticipate needs, train our workforce, create plans, and avoid duplication of actions
- **Resources** | Train our workforce, adopt necessary equipment, and permit flexibility in a structured system for unforeseen situations or events

ACCOUNTABILITY

How do we keep our partners engaged and responsible?

- **Oversight** | Identify leaders, chain of command, and an advisory board to identify problems and perform periodic revisions
- **Stakeholder engagement** | Engage stakeholders for their input on priority setting and review of performance
- **Public reporting** | Report data collections and analyses to the public regularly, broadly, and simplistically
- **Economic factors** | Analyze production, trade, and action plans (both executed and unexecuted) economically to evaluate returns on investments
- **Standards** | Identify and utilize scientifically-driven standards, quality control, and safety guidelines
- **Transparency** | Exhibit honesty, both internally and externally to the system

RELATIONSHIPS

What are the characteristics that embrace and build trust amongst all partners?

- **Transparency** | Ensure honesty, integrity, and respect across the different programs and demonstrate transparency with respect to each group's resources and funding allocations
- **Stakeholders** | Gain stakeholder support for the system
- **Resources** | Share existing resources between programs with responsibility to instill trust within the group and the invested projects
- **Goals/Missions** | Identify a shared, true mission to achieve through a collective effort among partners
- **Accountability** | Create measurable goals as a group and embed them throughout the structure

Participants were then assigned to several small teams to foster interactions and exchange ideas among representatives of diverse livestock and crop sectors. Each team was asked to envision a framework for tactical science that would address the overall needs of each programmatic area. For each framework,

participants were asked to describe the fundamental components and processes, functions, deliverables, and role of the leader or champions. Four different frameworks were developed. Although there was not a large degree of similarity among the frameworks, it is important to note that several teams recommended a structure that encompasses parts of the current system to build upon the major accomplishments that have been achieved. Common components across frameworks included effective communication, stakeholder engagement, adaptability/flexibility, effective priority-setting, and clearly designated leader(s) and/or champion.

CONCLUSIONS

Through these Calls to Conversation, a broad group of stakeholders and partners was challenged to think beyond the limitations of current funding lines and evaluate the existing processes and systems for protecting biosecurity of U.S. food and agriculture enterprise from threats from pests, diseases, contaminants, and disasters.

Participants frequently stressed the need to improve both internal and external communications, and a champion to coordinate and gather the different stakeholders for their input and impacts.

Moving forward, it is clear that the success of NIFA's tactical science programs must demonstrate continued commitment to inclusion of stakeholder and consumer needs, promote collaborations to ensure the effectiveness and efficiency of programs in an accountable manner, and which instills trust.

Appendix A: Groups represented at the Calls to Conversation on Tactical Sciences

American Association of Swine Veterinarians	National Pork Board
American Farm Bureau Federation	National Pork Producers Council*
American Veterinary Medical Association*	National Turkey Federation
AmericanHort*	North Central Regional Association (NCRA)*
Association of American Veterinary Medical Colleges*	National Integrated Pest Management Coordinating Committee (NIPMCC)*
Association of Public and Land-Grant Universities (APLU)	North Carolina State University*
Auburn University	North Central Cooperative Extension Association
Colorado State University	North Dakota State University
Cornell University	Ohio State University
Cornerstone	Oregon State University
Cornerstone Government Affairs	Purdue University*
Cranberry Institute	Rutgers University*
Crop Protection and Pest Management (CPPM)*	Science Based Strategies
Extension Disaster Education Network (EDEN)*	Texas A&M University*
Federation of Animal Science Societies*	U.S. Cattlemen's Association
Florida Fruit and Vegetable Association	U.S. Department of Homeland Security
Food Animal Residue Analysis Databank (FARAD)*	U.S. Food and Drug Administration - Center for Veterinary Medicine*
George Washington University - School of Public Health	U.S. Poultry & Egg Association
Indiana Board of Animal Health	University of California, Davis
Kansas State University	University of Florida
Michigan State University*	University of Maryland*
Minor Crop Pest Management (IR-4)*	University of Maryland Eastern Shore
Minor Use Animal Drug Program (MUADP)*	University of Minnesota*
Mississippi State University	University of Nebraska
Mitchen Leadership and Organization Development*	USDA-Animal Plant Health Inspection Service*
National Alliance of Independent Crop Consultants (NAICC)*	USDA-Agricultural Research Service
National Animal Health Laboratory Network (NAHLN)*	USDA-National Institute of Food and Agriculture*
National Association for the Advancement of Animal Science (NAAAS)*	Village Farms*
National Association of State Departments of Agriculture (NASDA)*	Virginia Tech
National Cattlemen's Beef Association*	
National Chicken Foundation	
National Farmers Union	
National Grange of the Order of Patrons of Husbandry	
National Milk Producers Federation*	
National Onion Association	
National Plant Diagnostic Network (NPDN)*	

*Indicates organizations represented at the first and second Calls to Conversation

