National Animal Health Laboratory Network Strategic Plan

PREFACE

- The National Animal Health Laboratory Network (NAHLN) was developed in response to the Public Health Security and Bioterrorism Preparedness and Response Act of 2002, and the Homeland Security Presidential Directive/HSPD-9 of 2004 to "develop nationwide laboratory networks for food, veterinary, plant health and water quality that integrate existing Federal and State laboratory resources, are interconnected, and utilize standardized diagnostic protocols and procedures".
- The NAHLN enables Federal and State laboratories to test for economically devastating and potentially zoonotic diseases such as foot-and-mouth disease, African swine fever, influenza in avian and swine species, and bovine spongiform encephalopathy (BSE) among other NAHLN scope diseases. It serves as our nation's most vital early warning system for emerging and foreign animal diseases.
- Adequate funding of the NAHLN directly addresses our nation's need for a safe, stable and nutritious food supply, and enables preparation, prevention, diagnosis, response, and recovery from economically important and potentially zoonotic diseases.

VISION

The National Animal Health Laboratory Network (NAHLN): a network of animal disease diagnostic laboratories that works effectively as a team, provides ongoing disease surveillance, responds quickly to disease events, communicates diagnostic outcomes to decision makers in a timely manner, and has the capability and capacity to meet diagnostic needs during animal disease outbreaks.

MISSION

The NAHLN is a nationally coordinated network and partnership of Federal, State, and university-associated animal health laboratories. NAHLN laboratories provide animal health diagnostic testing, methods research and development, and expertise for education and extension to detect biological threats to the nation's animal agriculture, thus protecting animal health, public health, and the nation's food supply.

KEY Principles

The NAHLN will:

- Maintain the capability and capacity to provide nationwide laboratory services in support of early detection and response to foreign animal disease outbreaks or other adverse animal health events;
- Operate within a quality management system that meets American Association of Veterinary Laboratory Diagnosticians (AAVLD), International Organization for Standardization (ISO) 17025, or equivalent standards;
- Provide national diagnostic laboratory quality management system training;
- Establish and maintain uniformly trained and competent animal disease diagnostic laboratory personnel;
- Provide national animal disease diagnostic technical proficiency testing through the National Veterinary Laboratory Services (NVSL);
- Use standardized protocols, reference materials, and equipment;
- Support the development, validation, and deployment of critical animal disease diagnostic testing methods through research and data exchange;
- Establish and implement secure, rapid electronic communications systems to optimize reporting, alert and epidemiological needs;

- Use facilities that maximize biosafety, biosecurity and physical security requisite for testing performed;
- Evaluate animal health emergency preparedness through scenario testing to identify and prioritize testing and communication gaps;
- Assess the health and well-being of the country's livestock population through active and passive diagnostic surveillance testing for exotic, emerging, and zoonotic diseases of animals;
- Support the development of a system of "first detectors" through training of private veterinarians, extension educators, producers, and state and federal animal health officials;
- Continually assess the need for optimized and flexible network capacity.

NAHLN Strategic Priorities for next 3 years

- **Disease identification and Surveillance—** the purpose of NAHLN is to provide early detection, rapid response and appropriate recovery from an adverse animal health event. Activities supporting the priority of disease identification and surveillance focus around identification of high-consequence pathogens including those that are transboundary/foreign animal diseases (FAD), endemic to the US or newly emerging diseases. The objectives within this priority are grouped based on their relevance to these three disease categories. General activities support all three categories are listed separately while activities listed for each separate category will provide more focused accomplishments.
    - o General activities in support of this priority
        - o Incorporate the use of whole genome sequencing into NAHLN policy
        - o Harmonize protocols within and across diseases as much as possible
    - o Activities specific to Transboundary diseases(FAD)
        - o Validate the use of aggregate sampling for FAD testing
        - o Identify second vendor for all platforms and reagents
    - o Activities specific to Endemic diseases
        - o Support the development of protocols to handle look- alike disease testing
        - o Determine a limit for NAHLN resources that should go to support endemic disease management
        - o Develop a process for sharing endemic disease protocols on the APHIS Lab Portal
    - o Activities specific to Emerging diseases
        - o Establish library of effective virus family/genus consensus primers (Microarray) for NAHLN labs.
        - o Establish list of metagenomics facilities, Universities and NAHLN labs.
        - o Foster sharing and establishment of background sequence library for background subtraction (e.g. bovine oral swab).
        - o Share and discuss technical aspects within the Methods Technical Working Group for future purchase decision.
        - o Start testing scenarios with known infectious disease agents to try-out the system.
        - o Consider purchasing metagenomics instrumentation for NAHLN labs, establish plan for personnel, SOPs and check tests.
        - o Scenario and Proficiency testing using metagenomics.

- **Standardized data capture and electronic messaging**—continue to improve and expand the capability of all NAHLN labs to electronically message test results. Standardize the process of developing a message across diseases and integrate with other Federal systems, as well as key external systems.

  Specific Activities:
  - Expand messaging capability and increase the number of laboratories capable of messaging.
  - Develop and communicate a messaging policy so the expectations surrounding messaging are understood.
  - Continue to collaborate with NVSL to increase their messaging capabilities and integration with LMS and other systems.
  - Expand capability for all USDA-APHIS Veterinary Services diseases to be messaged.
  - Target 100% messaging among NAHLN laboratories.
  - Improve data quality through incorporating software such as Palantir and Tableau
  - Integrate with other systems as required including CLSM and NLRAD

- **Integrate with and support animal health community long-term initiatives**—including but not limited to: supporting goals and objectives of the National Biodefense Strategy most directly applicable to NAHLN; business continuity plans; comprehensive and integrated surveillance initiatives; participation in the Integrated Consortium of Laboratory Networks; and development and validation of new assays to support these initiatives.

  Specific Activities:
  - Participate in discussions surrounding development and tracking of the milestones and metrics for the National Biodefense Strategy
  - Participate in Secure Food Plans including defining and communicating the role of NAHLN labs in their implementation
  - Support further validation and integration of pooled sample types, identified as a priority by animal industries.
  - Support Antimicrobial Resistance studies utilizing NAHLN laboratories
  - Continue working within the Integrated Consortium of Laboratory Networks (ICLN)

- **Ensure a coordinated effort to meet resource needs for NAHLN –** among APHIS-VS, National Institute for Food and Agriculture (NIFA) and AAVLD partners through stakeholder input and communication.

  Specific Activities:
  - Develop a current Operational Plan
  - Continue interagency coordination of funding for NAHLN laboratory infrastructure support.
    - Work to identify labs that APHIS will consistently fund and labs NIFA will consistently fund to avoid transferring labs between APHIS and NIFA as a funding source.
  - Identify NAHLN resource needs and develop plan for future years of support (funding, personnel, facilities, etc.), especially with regard to the structure and other NAHLN strategic priorities.
    - Have an economic impact study done for the NAHLN to support
    - Identify and document unique IT needs for NAHLN
  - Develop a communication plan for animal health stakeholders describing the scope, function, priorities, challenges, and budget needs of the NAHLN

- Determine the minimum amount needed at each Level designation to ensure effective NAHLN participation.
- Determine prioritized list of activities for consideration should additional funding become available

- **Continuation of codification activities:** develop 9CFR language; submit and complete codification process.

    Specific Activities:
    - Finalize program standards
    - Complete economic assessment
    - Follow through on the process as directed following evaluation in the Spring of 2019

APPENDIX A-- Strengths, Weaknesses, Opportunities and Threats

Strengths
- Demonstrates success as a State/Federal partnership for over ten years
- Nationally coordinated network of almost all publicly-funded animal disease diagnostic laboratories
- Coordinating Council made up of Federal and State partners
- Standardized and regularly audited quality system requirements in NAHLN laboratories
- Laboratory facilities with significant BSL-2 and BSL-3 capabilities and capacities
- Secure communications for data reporting and alert notifications
- Developed and implemented NAHLN IT system for HL7 messaging
- Unmatched national resource of expertise in animal disease diagnostics and facilities
- Standardized, practical assays deployed for fourteen important infectious animal diseases
- Laboratory staff that is proficiency trained and tested for use of deployed assays
- Demonstrated competence in national animal disease surveillance efforts
- Productive alliances established with other national laboratory networks through the integrated consortium of laboratory networks (ICLN)
- Name recognition in important parts of the Executive Branch, Congress, and industry
- Partnering with AAVLD accreditation program to provide maximum effectiveness, economy and efficiency
- NAHLN Methods Technical Working Group provides essential and effective network-wide input into test development and validation
- NAHLN Exercises and Drills Working Group develops and/or supports the participation of NAHLN laboratories in local, regional and National exercises and drills to increase preparedness
- Network laboratories have diagnostic expertise and testing capabilities to diagnose known infectious and non-infectious diseases.
- Network laboratories have diagnostic expertise and testing capabilities to identify emerging diseases.

Weaknesses
- Lack of updated/current operational plans for the near future
- Based on disease and its route of incursion, there may potentially be inadequate surge capacity due to insufficient numbers of trained personnel, lack of equipment, and/or lack of assay supplies
- Lack of standardized assays for several important infectious animal diseases
- Efficient and timely data collection and electronic messaging limited and not fully developed
- Decreased on-going surveillance programs due to reduced Federal funding
- Inability to secure adequate funding in spite of significant lobbying efforts

Opportunities
- Potential for increased Federal funding for laboratory infrastructure and all NAHLN activities through Federal appropriations and other Federal and non-Federal sources including the Farm Bill
- Potential for increased infrastructure enhancement and diagnostic capabilities through competitive grant programs
- Potential for enhanced communications and alliances with other State and Federal partners and industry
- Partner with Federal and non-federal partners for utilizing NAHLN infrastructure and data with the integration into on-going national scale efforts such as swine comprehensive surveillance development, business continuity planning, enhanced passive surveillance, etc.
- Enhance functionality and partnering with the Integrated Consortium of Laboratory Networks

- Implementation of NAHLN Concept Paper network re-organization to improve effectiveness and efficiency

Threats

- Level or decreased Federal funding of surveillance programs, directed testing, and laboratory infrastructure enhancements
- Continued decreased level of State funding for support of laboratories and infrastructure
- Outbreak of significant disease for which the NAHLN is not prepared, either through lack of capability (i.e., lack of diagnostics for known diseases) or lack of capacity (i.e., surge)
- Emergence of significant disease for which there are not developed or validated assays
- Potential lack of cooperation between states, and between states and the federal government in the face of a significant disease event