

NAHLN Enhances Early Detection Efforts

The United States Department of Agriculture's (USDA) Homeland Security Office established the National Animal Health Laboratories Network (NAHLN) as part of a national strategy to coordinate and network the diagnostic testing capacities of the Federal veterinary diagnostic laboratories with the extensive infrastructure (facilities, professional expertise, and support) of State and university veterinary diagnostic laboratories. This network enhances the Nation's early detection of, response to, and recovery from animal health emergencies, including bioterrorist events, newly emerging diseases, and foreign animal disease (FAD) agents that threaten the Nation's food supply and public health.

Laboratory Membership

In 2002, USDA's Animal and Plant Health Inspection Service (APHIS) and Cooperative State Research Education and Extension Service initiated the network by entering into cooperative agreements with 12 State and university veterinary diagnostic laboratories. These were funded by Homeland Security appropriations.

APHIS has since contracted with additional diagnostic laboratories to assist with testing and surveillance. These contracts are with 54 State/university laboratories; the Department of the Interior (DOI) laboratory in Madison, WI; the Food Safety and Inspection Service laboratory in Athens, GA; and the National Veterinary Services Laboratories (NVSL) campuses at Ames, IA, and Plum Island, NY, for a total of 58 laboratories in 45 States.

NVSL trains and proficiency tests the NAHLN member laboratories either annually or semi-annually. Tests include standardized screening methods for currently targeted diseases

in the NAHLN. These include avian influenza (AI), exotic Newcastle disease (END), foot-and-mouth disease (FMD), classical swine fever (CSF), bovine spongiform encephalopathy (BSE), chronic wasting disease (CWD), and scrapie. NAHLN labs perform screening assays and forward suspect or positive samples to the NVSL for confirmatory testing.

Current Activities

- APHIS developed and implemented a “Train the Trainer” program for FMD, CSF, AI, and END rapid assays. This increased the number of State/university laboratories approved to conduct the CSF and FMD assays from 14 to 33. The program was recently implemented for AI and increased the number of State/university and DOI laboratories approved to conduct AI testing from 44 to 53 laboratories. Not only has the program increased the number of laboratory personnel prepared to respond to a national animal health emergency, but it provides a cadre of trainers available to teach others. Successful implementation of this program is a significant step for the network and its mission of ensuring sufficient diagnostic capability and capacity to address an animal health emergency.
- Fifty-three laboratories (52 approved State/university laboratories and one DOI NAHLN laboratory) conduct enhanced AI surveillance efforts for APHIS Veterinary Services (VS) and Wildlife Services. These laboratories determine if evidence of the AI virus is present and whether it is an H5 or H7 subtype. Because of the potential for H5 or H7 subtypes to mutate into highly pathogenic strains, labs forward presumptive positive samples to NVSL for confirmatory testing. NVSL then conducts additional screening tests and confirmatory tests with research assistance from USDA’s Southeast Poultry Research Laboratory as needed to confirm genetic identification of isolated strains of the virus. The

NVSL Diagnostic Virology Laboratory in Ames is the only internationally recognized AI reference laboratory in the United States.

- NAHLN and AI supplemental funds are used to increase the overall diagnostic testing capability of member laboratories by supporting the development and distribution of high throughput equipment. This technology allows semi-automated processing of diagnostic samples and test methods to enhance the daily testing output of each laboratory. In order to determine the most appropriate placement of the high throughput equipment within NAHLN laboratories, NAHLN requested the assistance of analytical epidemiologists from the Risk Analysis Team within the VS Centers for Epidemiology and Animal Health's Center for Animal Disease Information and Analysis. This team prepared a risk assessment model to evaluate the risk level of highly pathogenic avian influenza introduction and spread, and created a prioritized ranking of States based on risk level. NAHLN purchased high-throughput equipment that was distributed in 2007 to 31 NAHLN laboratories located in highest risk States. Currently, APHIS is validating NAHLN methods for AI, CSF, and FMD using this technology.
- In January 2006, USDA developed and implemented phase one of a CSF surveillance plan in States with a high risk for introduction of CSF, and Puerto Rico. Twelve State/university NAHLN laboratories test samples and 18 other State/university NAHLN laboratories assist with sample collection and processing. The number of State/university NAHLN laboratories participating in surveillance testing has increased to 33 in 2007. NVSL's Foreign Animal Disease Diagnostic Laboratory at Plum Island, NY, performs confirmatory testing.
- USDA and the Department of Homeland Security (DHS) are continuing to update and implement a diagnostic roadmap to evaluate and prioritize gaps in available diagnostic technology for U.S. agriculture and propose mechanisms to address and ultimately close

them. A high-level strategic roadmap, applicable across a range of FAD threats, was developed in addition to roadmaps specific for several high-consequence FADs.

- Since June 2004, seven State/university NAHLN laboratories have participated in enhanced BSE surveillance testing. As of December 1, 2006, they completed more than 797,000 tests. NVSL's Pathobiology Laboratory in Ames, IA, performs confirmatory testing. Surveillance for CWD and scrapie also occurs in 26 State/university NAHLN labs.

International efforts:

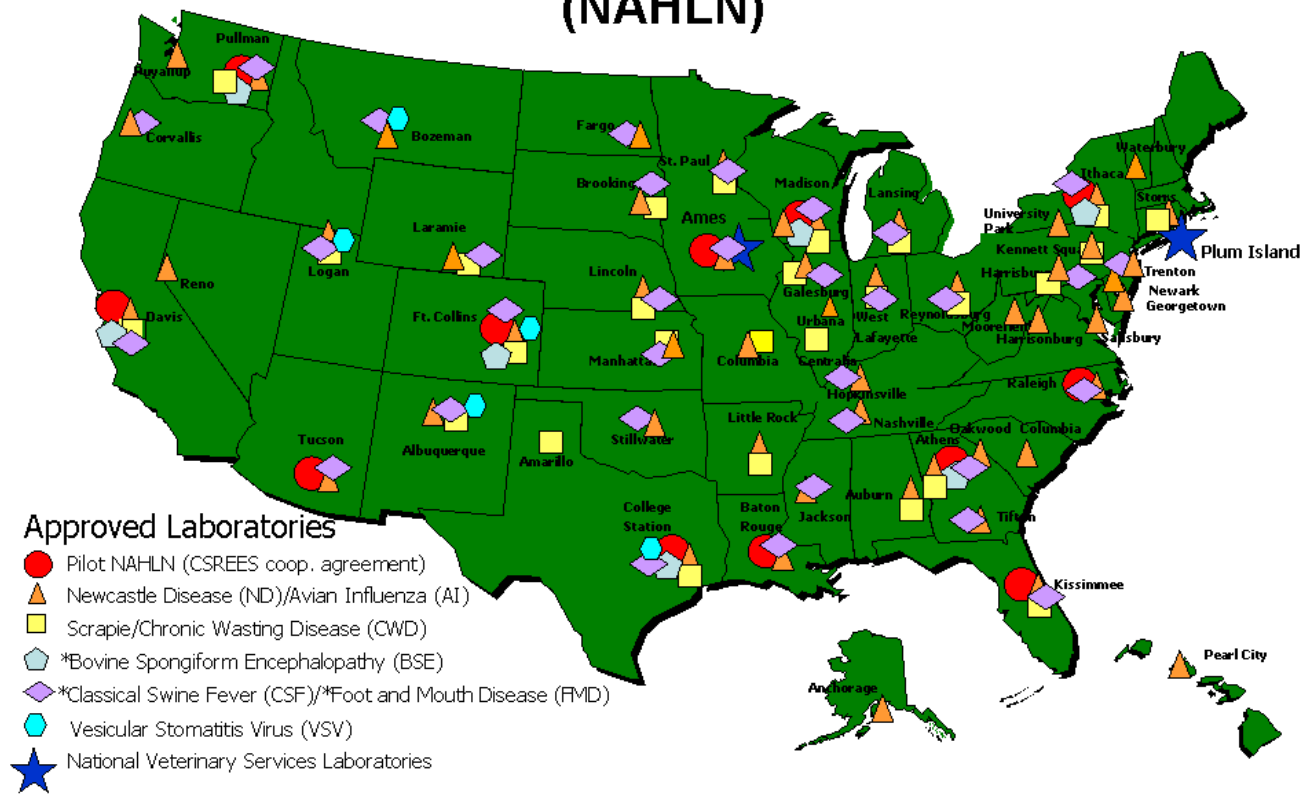
- APHIS collaborates with the Canadian Food Inspection Agency laboratory at the Winnipeg National Centre for Foreign Animal Disease to produce, distribute, and use proficiency panels and reference materials to harmonize the diagnosis of major animal diseases between the United States and Canada.
- APHIS is working with animal health laboratory network personnel from Canada and Mexico to develop the terms of cooperation and a road map toward the harmonization of tests used in North America for the diagnosis of animal diseases. This initiative addresses a key objective of the Security and Prosperity Partnership of North America toward creating a safer and more reliable food supply, while facilitating agricultural trade, by pursuing common approaches to enhanced food safety, enhanced laboratory coordination, and information sharing.
- APHIS developed and provided international training programs for AI epidemiology and diagnostics to laboratory personnel from 60 countries. APHIS developed and implemented similar training programs in seven countries for FMD and brucellosis.
- A critical aspect of the NAHLN is the effort to standardize data, improve data quality, and maximize the efficiency of data transfer via the information technology (IT) infrastructure and data repository. The NAHLN IT system is being integrated with numerous existing animal health and veterinary diagnostic data networks to allow seamless electronic transfer of

information from the time diagnostic samples are collected in the field, to the addition of appropriate diagnostic test information from the NAHLN laboratories, and finally to the daily reporting of relevant information from each submission to the NAHLN repository database. The IT system enhances surveillance programs, recognizes emerging issues, and provides automated alerts on defined animal health events to authorized personnel who support disease prevention and response. The system allows NAHLN labs to securely transmit and store data using nationally recognized health information standards that improve data quality and data re-use in systems such as the DHS National Biosurveillance Integration System (NBIS). The NAHLN IT system has been piloted in five laboratories and is currently expanding to 30 additional laboratories. In 2006, the USDA provided training courses on IT messaging to NAHLN laboratory personnel.

- NAHLN Methods Technical Working Group, established in July 2006, consists of personnel from NAHLN laboratories and NVSL. The working group provides input on various aspects of methods validation and approval of methods including:
 - Review of available methods and associated gaps
 - Identification of potential new technologies
 - Validation criteria
 - Dossier review
 - Assay approval process
 - Equivalency of modified methods or for adaptation to new platforms
 - Continual performance assessment of assays
 - Development of performance characteristic summary documents for NAHLN assays
 - Issues associated with transfer of existing and new technologies to laboratories.
- NAHLN is a participating member of the Integrated Consortium of Laboratory Networks (ICLN), which is a multi-department and multi-agency effort led by DHS. The ICLN includes

public, animal, and plant health response networks (Laboratory Response Network, Environmental Laboratory Response Network, Food Emergency Response Network, National Plant Diagnostic Network, and NAHLN). This group identifies gaps in surveillance and diagnostic efforts of national importance, and develops mechanisms for collaboration and sharing of information and resources.

National Animal Health Laboratory Network (NAHLN)



*For specified agents, not all laboratories are currently participating in surveillance testing.

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