NAHLN 2019 Recommended Spending Plan

VS received 57 proposals in response to the 2019 NAHLN funding opportunity announcement totaling $19.1 million in requests.

NAHLN Farm Bill funding proposals were evaluated by 18 volunteer reviewers including representatives from Veterinary Services (VS) Diagnostics and Biologics, VS Strategy and Policy, MRP IT and 2 reviewers formerly associated with NAHLN through NIFA. A minimum of 3 reviewers evaluated and scored each proposal. Groups of 6 reviewers then developed consensus scores for each proposal. A final ranking and recommendation was developed following discussions held by the NAHLN Executive Committee and NVSL reference laboratory directors.

The 26 recommended proposals were submitted by 19 NAHLN laboratories representing 19 states. Collectively, they address each of the four priorities set forth for NAHLN related Farm Bill funding including test method development and validation, improving electronic transmission of data, increasing biosafety and biosecurity in laboratories and enhancing emergency preparedness. Six NAHLN laboratories have 2 or more proposals that have been recommended. Five of these submitting NAHLN laboratories have Level 1 designation and one is a NAHLN affiliate laboratory. The remaining individual proposals that have been recommended come from another six Level 1 laboratories, six Level 2 laboratories and one Level 3 laboratory. The total recommended funding amount for the 26 proposals is $4,999,705.

2019 NAHLN Recommended Proposal Details

Arkansas

Interconnected Electronic Reporting and Transmission of Data

Applicant:	Arkansas Livestock & Poultry Commission Laboratory
Recommended funding:	$71,500
Summary:	The objectives of this proposal are to 1) develop customized accessioning and resulting screens for capturing disease specific data elements identified as required for NAHLN reporting, 2) optimize HL7 capacity and 3) maximize LIMS resiliency to address unplanned interruption of local internet service and allow for remote accessioning through purchase of 6 computers to implement mobile computing with wireless hotspots.

Colorado

Novel Approach to Diagnose and Genetically Characterize High Consequence Pathogens Affecting Animal Health

Applicant:	Colorado State University Veterinary Diagnostic Laboratory
Recommended funding:	$93,404
Summary:	This grant proposes to 1) perform a methods comparison of metagenomics (next gen sequencing-based) diagnosis using the minION sequencing platform vs. traditional

diagnostic methods for routine clinical samples, and to 2) compare this method plus a new test method (Luminex Mag Pix) to current diagnostic tests for use in surveillance for avian influenza and bluetongue virus.

Colorado State University Veterinary Diagnostic Laboratories - Enhancement of Chronic Wasting Disease and Scrapie Diagnostic Testing Capabilities

Applicant:	Colorado State University Veterinary Diagnostic Laboratory
Recommended funding:	$197,200
Summary:	The objectives of this proposal are: Improve chronic wasting disease and scrapie immunohistochemistry detection capabilities. Expand diagnostic testing capacity through the addition of a new immunohistochemistry instrument.

Florida

Bronson Animal Disease Diagnostic Laboratory - Enhancement of Chronic Wasting Disease Testing Capacity

Applicant:	Bronson Animal Disease Diagnostic Laboratory
Recommended funding:	$150,000
Summary:	The objectives of this proposal are: Double the CWD IHC testing capacity at BADDL to increase surveillance and safeguard against this potentially devastating emerging disease. Provide training to laboratory staff expected to complete increased sample testing to ensure that testing is not interrupted. Institute NAHLN messaging for CWD IHC testing at BADDL and provide a template and instructions for other NAHLN laboratories to enhance electronic reporting and data transmission regarding this disease.

Georgia

Enhancing the National Animal Health Laboratory Network (NAHLN) Diagnostic Capability through electronic reporting and transmission of data

Applicant:	Athens Veterinary Diagnostic Laboratory
Recommended funding:	$412,122
Summary:	The objectives of this proposal are to create interfaces to 1) allow VetView laboratories to modify and customize the VetView Portal to allow creation or customization of disease or program specific online submission forms based on disease or program, 2) to create mobile apps or custom online resources to create accessions for specific programs and 3) to create mobile apps or custom forms for input of result data, 4) add sample location and tracking.

United front to develop harmonized NGS training and procedures to increase the capabilities and capacity of NAHLN laboratories in response to antimicrobial resistance (AMR)

Applicant:	Athens Veterinary Diagnostic Laboratory
Recommended funding:	$412,580
Summary:	The objective of this grant application is to enhance next-generation sequencing (NGS) capacity of seven NAHLN laboratories. They propose laboratory capacity building through equipment purchasing, training, and protocol harmonization.

Kansas

Strengthening and enhancement of Kansas State Veterinary Diagnostic Laboratory (KSVDL) capacity for FAD Emergency preparedness and response

Applicant:	Kansas State Veterinary Diagnostic Laboratory
Recommended funding:	$188,597
Summary:	The objectives of this proposal are to 1) purchase equipment to build surveillance testing capacity in both BSL3 and BSL2 space, 2) purchase software to institute barcoding and sample tracking capability and 3) allow direct transfer of data from ABI7500 into the lab's LIMS.

Minnesota

Validation of alternative samples for the diagnosis and surveillance of African swine fever

Applicant:	University of Minnesota Veterinary Diagnostic Laboratory
Recommended funding:	$47,188
Summary:	Objectives are to validate pooled blood swabs and spleen swabs as a sample type for African Swine Fever (ASF), to then be incorporated into NAHLN testing procedures. The investigators propose to leverage an on-going collaboration with researchers in VietNam to obtain samples from naturally infected animals. ASF preparedness is a significant priority for the NAHLN, and additional aggregate sample types are needed to help reduce burden on the testing laboratories should an outbreak hit the U.S.

Missouri

University of Missouri Veterinary Medical Diagnostic Laboratory - Enhancing Testing Capacity in Biosafety Level-3 Laboratory for Improved Detection of and Response to Foreign Animal Diseases

Applicant:	Veterinary Medical Diagnostic Laboratory
Recommended funding:	$104,108
Summary:	The objective of this proposal is to build testing capacity in MU VMDL BSL-3 laboratory for the purpose of improving the detection of NAHLN scope diseases. The objective is included in NAHLN Priority 2 –Enhancing biosecurity and biosafety procedures and capacity in NAHLN laboratories.

North Carolina

Rollins Animal Disease Diagnostic Laboratory - Enhancing Testing Capacity and Diagnostic Capabilities Using High Throughput Polymerase Chain Reaction Assay

Applicant:	Rollins Diagnostic Laboratory
Recommended funding:	$66,021
Summary:	The objectives of this proposal are: Increased testing capacity for NAHLN scope diseases via new testing platform validation. The QuantStudio 384-well molecular diagnostic equipment will increase the lab's capabilities for PCR testing as it can complete four times as many reactions as their current 96-well format PCR systems.

North Dakota

North Dakota State University Veterinary Diagnostic Laboratory - Enhancing laboratory preparedness for NAHLN scope diseases

Applicant:	North Dakota State University Veterinary Diagnostic Laboratory
Recommended funding:	$100,310
Summary:	The objectives of this proposal are: Enhance lab preparedness for surveillance, surge, and response testing capacity for NAHLN diseases by adding additional equipment to BSL-3 laboratory. Enhance biosafety by ensuring containment of high consequence pathogens.

Nebraska

Sequence-based real-time identification of NAHLN scope viral diseases and emerging viral diseases using long read approaches

Applicant:	University of Nebraska Veterinary Diagnostic Center
Recommended funding:	$230,153
Summary:	This proposal outlines a project to first develop and validate metagenomics sequencing as a diagnostic tool for detecting swine viral diseases from mixed infection/contaminated samples (focusing first on NAHLN scope diseases), then to develop this tool for screening aggregate/pooled samples for these diseases. Preliminary data showing this application with an endemic swine disease (Seneca Valley-A virus) demonstrates a high likelihood of success.

New York

Enhancing the National Animal Health Laboratory Network (NAHLN) Diagnostic Capability and Emerging Disease preparedness through Next-Generation Sequencing

Applicant:	Cornell University Animal Health Diagnostic Center
Recommended funding:	$900,000
Summary:	This proposal leverages collaborations across 9 different institutions, with the intent to develop and optimize next-generation sequencing (NGS) techniques and analysis pipelines for 7 different diseases, for use within the NAHLN. Two different sequencing platforms (Illumina iSeq and Oxford Nanopore MinION) will be compared to comply with NAHLN policy of using two different vendors where feasible.

Cornell Animal Health Diagnostic Center / New York State Veterinary Diagnostic Laboratory (AHDC/NYSVDL) - Cornell AHDC/NYSVDL Emergency Preparedness Capacity

Applicant:	Cornell University Animal Health Diagnostic Center
Recommended funding:	$195,093
Summary:	The objectives of this proposal are: Purchase and install new equipment for outbreak response. Install and set up molecular equipment for evaluating new protocols for NAHLN scope diseases.

Oklahoma

Deep Learning Computational Algorithms for Disease Diagnosis by Genome Sequencing

Applicant:	Oklahoma Animal Disease Diagnostic Laboratory
Recommended funding:	$158,136

Summary:	The objective of this proposal is to develop a machine learning based framework to help automate routine disease diagnostics through genome sequencing leveraging existing related work. A two-pronged approach is proposed using Graph Convolutional Neural Networks (GCN) [8] and Long Short-Term Memory Networks (LSTMs).

Development of an Interactive Spatial Agrometrics Tool for the Calculation of Livestock (Cattle, Swine and Poultry) Populations in the United States at the County and Parish Level

Applicant:	Oklahoma Animal Disease Diagnostic Laboratory
Recommended funding:	$160,424
Summary:	The objectives of this proposal are to develop a GIS database and mapping tool for accurately monitoring livestock populations to visualize temporal and geographic distribution of animals. The intended use is for allocating APHIS resources and predicting laboratory support needed during an outbreak.

Pennsylvania

University of Pennsylvania PADLS New Bolton Center - Enhanced surveillance and outbreak surge capacity testing for high-consequence, NAHLN-scope animal diseases

Applicant:	University of Pennsylvania School of Vet Med, New Bolton Center
Recommended funding:	$144,056
Summary:	The objectives of this proposal are: Maintain disease surveillance testing capacity for high consequence, NAHLN-scope animal diseases. Enhance outbreak testing capacity for high consequence, NAHLN-scope animal diseases. Improve emergency preparedness and response capabilities in the event of an adverse animal health event or emerging infectious disease through the implementation of new equipment and technologies

South Carolina

Implement NAHLN Order Message Receiver in USALIMS

Applicant:	Clemson Veterinary Diagnostic Center
Recommended funding:	$105,021
Summary:	The objectives of this proposal are to develop a message receiving component with temporarily storage capacity and accessioning user interface. This component will allow USALIMS to receive NAHLN Order messages and electronically incorporate the messaged data to effectively reduce accessioning and transcription errors during high volume testing that occurs during an outbreak. This functionality will be available to all 14 laboratories with USALIMS.

Tennessee

Scalable Field PCR Platform for Senecavirus A and Foot and Mouth Disease

Applicant:	Kord Animal Disease Diagnostic Laboratory
Recommended funding:	$250,000
Summary:	The objectives of this proposal are to develop a novel adaptive real-time (art) PCR for field diagnosis of Senecavirus A (SVA) and foot-and-mouth disease (FMD).

Texas

Development and validation of a universal real-time RT-PCR assay to distinguish between virulent APMV-1 and APMV-1 of low-virulence and development of primers-probes bank for rapid distribution to field laboratories in response to a virulent APMV-1 outbreak in the United States

Applicant:	Texas A&M Veterinary Medical Diagnostic Laboratory
Recommended funding:	$152,925
Summary:	The objectives of this proposal are to 1) sequence different Newcastle Disease (ND) viruses from around the world to create a comprehensive database, 2) design and validate a PCR to detect all currently circulating strains of ND, and 3) develop a primer/probe reagent bank for distribution to the NAHLN in the event of a vND outbreak.

Enhancing Antimicrobial Resistance Surveillance via Veterinary Diagnostic labs through XML results messaging

Applicant:	Texas A&M Veterinary Medical Diagnostic Laboratory
Recommended funding:	$104,060
Summary:	The objectives of this proposal is to develop an XML message schema for AMR testing and upgrade the integration of the Sensititre broth microdilution platform with the lab's current laboratory information system. The AMR xml message schema would be made available to all labs for use as a replacement of the spreadsheet and spreadsheet uploaded currently in place for AST testing.

Preparedness for Throughput Scaling

Applicant:	Texas A&M Veterinary Medical Diagnostic Laboratory
Recommended funding:	$33,248
Summary:	The objective of this proposal is to commission the creation of a custom label generator in the lab's LIMS to support current and future workflows within the lab.

Washington

Laboratory Detection Preparedness of Emerging Diseases in Aquatic Species

Applicant:	Washington Animal Disease Diagnostic Laboratory
Recommended funding:	$400,000
Summary:	The objectives of this proposal are to validate a method for diagnosing emerging aquatic diseases using known positive infectious salmon anemia virus diagnostic cases, then use the validated approach on other diagnostic cases where a known etiology has not been determined to see if a new/emerging disease can be identified.

Wisconsin

USGS National Wildlife Health Center - Building capacity to rapidly detect agents of emerging infectious disease

Applicant:	USGS National Wildlife Health Center
Recommended funding:	$167,292
Summary:	The objectives of this proposal are: To improve the ability of the National Wildlife Health Center (NWHC) to rapidly detect novel etiological agents causing disease in wild animals. They intend to take advantage of a unique feature of the Oxford Nanopore Minion next generation sequencing platform to develop a system for real-time virus identification. They hope to identify the virus in a sample in as little as 30 minutes.

To enhance the ability of the Wisconsin Veterinary Diagnostic Laboratory (WVDL) to rapidly characterize causative agents of unusual or atypical diseases in domestic animals, with a focus on dairy cattle. They will take advantage of the higher read density of the Illumina iSeq 100 system and develop bioinformatic pipelines for pathogen characterization. They aim to define the conditions under which complete genomes of a viral pathogens may be reliably derived.

To enhance the ability of the NAHLN laboratory network to quickly detect and characterize emerging pathogens. They will determine the analytical sensitivity of virus detection for two NGS platforms, formulate standardized procedures for nucleic acid extraction, library preparation, and instrument runs.

To enable NAHLN and other laboratories to gain the capability for emerging pathogen detection, a training module will be developed along with sample datasets that can be used by interested laboratories.

USGS National Wildlife Health Center - Capacity building in Wisconsin – Enabling compliance at the National Wildlife Health Center and surge support for the Wisconsin Veterinary Diagnostic Laboratory

Applicant:	USGS National Wildlife Health Center
Recommended funding:	$100,946
Summary:	The objectives of this proposal are:

Purchase new equipment to improve laboratory capacity at the National Wildlife Health Center by 50% to perform real-time PCR tests for NAHLN program diseases. As a result of this additional equipment, increased laboratory capacity is expected to be sustained for the next 8 to 10 years.

Ensure the equipment is set up appropriately and able to interface with the USGS computer network.

Ensure that the equipment performs appropriately for conducting NAHLN tests.

Wyoming

Wyoming State Veterinary Laboratory - One Health Wyoming: Enhancing Interlaboratory Coordination for Emerging Diseases

Applicant:	Wyoming State Veterinary Laboratory
Recommended funding:	$55,321
Summary:	The objectives of this proposal are:

Establish a common next generation sequencing (NGS) platform for detection and characterization of emerging pathogens in humans, domestic animals and wildlife in Wyoming.

Provide for the shared use of BSL-3 diagnostic space, including Select Agent registered space, by the three relevant laboratories in Wyoming.