

REPORT OF THE USAHA / AAVLD COMMITTEE ON ANIMAL HEALTH INFORMATION SYSTEMS

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The Committee met on Sunday, October 15, 2006 at the Minneapolis Hilton Hotel, Minneapolis, Minnesota from 12:30-5:30p.m. Attendance fluctuated between 25 and 40.

Dr. Akey, Co-Chair welcomed the participants and presented the meeting agenda. Oversight of design, implementation and expansion of the National Animal Health Reporting System (NAHRS) has constituted the principal activity of the Committee between meetings, as the Committee Co-Chairs also Co-Chair the NAHRS Steering Committee.

Dr. Stanley Bruntz, NAHRS Coordinator, National Surveillance Unit (NSU): Centers of Epidemiology and Animal Health (CEAH), Veterinary Services (VS) presented the annual report on the status of the NAHRS. With two more States now reporting since 2005, NAHRS presently assembles animal disease data from 44 States. Only Connecticut, Georgia, Iowa, Missouri, New Mexico and Rhode Island are non-participants to date. The NAHRS Online Reporting Application which was developed and implemented in 2005 has greatly simplified and facilitated reporting, and, in conjunction with additional administrative assistance from the NSU, has lead to consistent 12 month reporting by all participating States.

Dr. Bruntz also laid out some challenges for aquaculture disease reporting and representation of sufficient and diversified expertise, i.e. finfish, mollusks and crustaceans in the working group. Currently NAHRS only collects disease information on 5 of 24 'aquaculture' diseases, including only finfish but not mollusk or crustacean disease. He also indicated that a VS-National Aquaculture Health Plan is in development.

Dr. Bruntz also reported on the Equine Working Group's request for expanded equine health reporting, specifically for enhanced equine infectious anemia (EIA) reporting. Reporting should be expanded to include number of tests, and number of positive and negative horses. This reporting would simply replace the current annual EIA testing reporting being done by each state, utilizing the on-line reporting capabilities of NAHRS to simplify and streamline the process. Currently a plan is being developed for piloting the group's request.

Dr. Bruntz also reported on the NAHRS Steering Committee meeting in Fort Collins in September. A proposed action item was to change the structure of the Committee to reflect the continued evolution of the system from the seven pilot States to now 44 States. The Committee had proposed to change representation from the seven pilot States to include a State representative from each of the four United States Animal Health Association (USAHA) districts, plus potential inclusion of Area Veterinarians In Charge (AVIC) and other representatives. A motion for this change was made, seconded and approved.

After Dr. Bruntz's presentation, and in the business section of the meeting, members and attendees discussed the identified need for a unified federal list of notifiable and reportable diseases. All States have reportable lists which in general include most of the diseases listed by the World Organization for Animal Health (OIE). Committee members introduced, proposed and seconded a motion to recommend that CEAH direct its staff to compile and evaluate all current disease reporting and notification requirements in all States and suggest a federal list of reportable diseases for consideration at the 2007 USAHA Annual Meeting, Reno, NV.

Dr. Aaron Scott NSU-CEAH-VS reviewed activities, progress and current efforts towards the construction of the National Animal Health Surveillance System (NAHSS). The recently released Surveillance and Data Standards document will inform and guide all VS national and regional surveillance planning, development, implementation, operation and evaluation. The document provides guidelines on types and formats of data to be collected, as well as for proper data entry, storage and structuring of data systems for integration with existing and future databases of VS, States and other stakeholders in their regional and local surveillance efforts. There is a clear mandate for science-based planning within political, policy and resource constraints.

NSU staff are working out processes that include the first phase implementation of classical swine fever (CSF) surveillance based on the plan developed by the NSU using the National Animal Health Laboratory Network (NAHLN), completion of the scrapie surveillance evaluation and brucellosis surveillance evaluation, development and posting of the surveillance inventory, completion of enhanced bovine spongiform encephalopathy (BSE) surveillance evaluation and planning for maintenance surveillance, avian influenza (AI) surveillance planning, Rift

Valley fever surveillance planning. Ongoing activities include the development of a vesicular disease surveillance plan, development of targeted surveillance methods, and investigation of sentinel and syndromic surveillance methods.

Dr. Tracey Lynn NSU-CEAH-VS presented the recently launched US Animal Health and Productivity Surveillance Inventory which is posted at www.aphis.usda.gov/vs/nahss/inventory.htm. It is a database application that enables users to search for information about surveillance and monitoring programs, epidemiologic studies, and other activities related to animal health in the United States. Information is accessible and searchable by animal species; disease, condition or pathogen; data source or location of data collection; specimen type; information category, such as animal health surveillance program or study, food safety surveillance or trade related monitoring program; and agency responsible for the various programs or studies.

Dr. Mark Thurmond, University of California, Davis (UC Davis), presented the Foot and Mouth Disease(FMD) BioPortal: a real time, web-based system for secure routing of surveillance data, a project of the FMD Laboratory, UC Davis School of Veterinary Medicine in collaboration with the Artificial Intelligence Laboratory, University of Arizona. He presented an overview of current activities in developing specific bioportals for FMD global surveillance and animal disease monitoring. Collaborative efforts include development of FMD BioPortal for the database used by the FMD World Reference Laboratory, Pirbright, U.K. The system allows for remote and secure retrieval of specific data based on user-specified input criteria (country, serotype, species, etc). Output includes tables, graphs, spatio-temporal visualization of the case reporting, geographic display, visualization via Google Earth, and spatio-temporal cluster analyses. A new system is being developed for surveillance of FMD virus genomic variation, which presents phylogenetic analysis and display of genetic variation for FMD viruses isolated world wide. In cooperation with the Food and Agriculture Organization, the Dutch Committee on Afghanistan, and the Afghanistan government, a bioportal prototype is being developed to monitor 12 diseases of livestock and poultry in Afghanistan. To date, data and data summaries and displays are available for one year. The presented bioportal applications illustrate how surveillance information can be captured, analyzed, displayed, and routed securely in real time to those who need the information.

Dr. Jim Case, California Animal Health and Food Safety Laboratory System, University of California, Davis, gave a presentation entitled Limitations of Surveillance System Data and Information Systems as Action Triggers. There is increased interest in syndromic surveillance and early detection of emerging and foreign animal diseases. A number of areas within the NSU's strategic plan specifically mention the need to detect and rapidly disseminate information about animal health events. The development of national information systems to support this rapid detection and information dissemination is a key strategy in meeting these needs. However, there are a number of limitations that exist as

obstacles to dependence on information systems as the primary mechanism for disseminating information about critical animal health events. 1) Procedural Limitations - Procedural notification may be linear, delaying notification outside of a jurisdiction; restrictive protocols may result in meaningful but non-program specific data to be lost; 2) Temporal Limitations - Post-discovery actions begin before data is available in an electronic information system; 3) Interoperability Limitations - inability to share across surveillance programs; need for post-processing prior to analysis; a lack of comparability resulting in missed associations; 4) Policy Limitations - data collection may be constrained in scope and sample size; release of data to a central repository may be substantially delayed or prevented from being transmitted. Information systems supporting surveillance may not play a large role in event detection, but are very valuable in detecting incidence-based animal health events or events that are geographically separated but temporally associated.

Mr. Mark Koeneker, CEAH-VS-APHIS presented an overview of VS's development plans for animal health information systems. One example is a system, including hardware and software, to facilitate the collection of sample information and other data by field personnel and the subsequent seamless transmission of that data to laboratory, state and federal databases. This system is intended to be a model of information system architecture for most field data collection efforts. Starting with a pilot project in California last year that focused on sample data collection on poultry farms, the system is being expanded to inspection and sample data collection in live bird markets in several states. Future plans include adaptation of the system to the classical swine fever surveillance project among others. In each case, both a mobile data capture platform (tablet PC, optical pen, PDA) and a web-based interface are being created to facilitate data entry under diverse conditions. A second major effort underway involves the evolution of the Generic Database (GDB), an Oracle forms-based general application customized by each state for its use, to the Animal Health Surveillance and Monitoring (AHSM) application, a web-based interface with enhanced functionality, data validation and data quality standards. Modules are under development for AI, CSF, BSE, scrapie, and chronic wasting disease (CWD) surveillance programs. In addition to data collection, mapping and spatial analysis functionality is being included to add value to the user.

Dr. William Buisch, North Carolina, laid out some recent technologic advances in data capture and entry, presenting optical pens, hand-writing recognition software and forms development software. Use of these technologies has greatly improved both the efficiency and accuracy of data collection. Estimates of time saved on completing forms with these tools are up to 67%. Time savings may result in greater accuracy of entered data.

Dr. Pam Hullinger, Lawrence Livermore National Laboratory (LLNL) gave an update on advanced diagnostics and expanded capabilities for foreign animal disease detection and surveillance and the implementation of a supporting

information systems infrastructure to support “field-to-finish” diagnostics in a presentation entitled Agricultural Security Domestic Demonstration and Application Program Update (AgDDAP). The LLNL, under support from the Department of Homeland Security (DHS) and in collaboration with the USDA-APHIS, has developed a candidate multiplexed nucleic acid-based assay that simultaneously tests samples for foot-and-mouth disease virus and six other viruses that cause clinical signs in animals that are indistinguishable from FMD. The assay could enable early detection of FMD, which is critical for the reduction of spread and economic impact of the disease.

The NAHLN together with the National Veterinary Services Laboratory (NVSL) at the Plum Island Animal Disease Center (PIADC) are the front-line for FMD diagnosis and are potential end-users of this new technology. During November and December of 2005, thirteen NAHLN laboratories and the NVSL, PIADC received training, “leave-behind” instrumentation, reagents and consumables to conduct the assay. These labs then participated in a nationwide interlaboratory comparison of the multiplexed assay, during which more than 3,000 blinded samples were analyzed and greater than 52,000 individual assays conducted. The overall assay success rate was greater than 92%.

As a part of this collaborative effort, two pilot demonstrations of a rapid, scaleable, high-throughput laboratory system were conducted at the California Animal Health and Food Safety Laboratory (CAHFS), University of California, Davis, and the Veterinary Diagnostic Laboratory, Colorado State University, Fort Collins, CO. This high-throughput system could be used to provide timely, scaleable diagnostic laboratory support during a foreign animal disease outbreak.

During each demonstration, one-thousand clinical samples were processed within ten hours using only two technicians. Automation encompassed the transfer of liquid samples from collection vials to a 96-well plate, addition of an internal control, nucleic acid purification, multiplexed reverse transcriptase polymerase chain reaction (RT-PCR) amplification, liquid array hybridization, detection and data analysis. Integration of USDA-APHIS's electronic sample identification, tracking, and results reporting technology with each participating laboratory's Laboratory Information Management System enabled the live demonstration of a functional end-to-end system for surge capacity. The analytical performance characteristics of the multiplex assay will be evaluated in the months to come. Once the acquisition and analysis of the analytical data is complete, diagnostic performance data will be gathered in collaboration with the NAHLN, and other US and international partners.