

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

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The Committee held its 8th Annual Meeting on Sunday, November 6, 2005, from 12:30 to 5:30 p.m. in Hershey, PA. At the Hershey Lodge and Convention Center. Attendance fluctuated between 30 and 50 people, with 65 registered participants.

Dr. Akey Co-Chair welcomed the participants and introduced the committee's mission statement and the meeting agenda. The first item on the agenda was a time-specific scientific paper presentation by Mr. Jay Ross California Animal Health and Food Safety (CAHFS) Laboratory, University of California, Davis, entitled "*California Pilot Project – an end-to-end solution.*" The California Pilot Project was developed specifically to combat problems like poor data quality and the lack of direct data sharing among project/taskforce partners, which frequently hinders surveillance and disease mitigation efforts. The main goal of the project is to streamline data collection and facilitate data flow and information exchange, consequently freeing resources from the burden of data entry and data quality challenges. It is essential during outbreak control efforts that all participants be able to efficiently and accurately communicate reliable data and information. The initial testing of the design has been completed as of late October, and actual deployment is planned for December 2005. The avian influenza (AI) and exotic newcastle disease (END) surveillance program in California will serve as the test environment to ensure that the designed solution achieves the goals of the project and functions as expected in the real world. At the end of this project, a report will be circulated that includes all lessons learned. Mr. Ross's presentation is published as a separate report in these proceedings. The discussion following the presentation involved questions on data prioritization and the need for human/operator/veterinary subject matter expert input. The project does not imply any new developments, but coordinates currently available tools and systems. Estimated costs are ~ \$1,500 per workstation, i.e. to equip a federal or state collector with a tablet computer and software tools. Expected problems were the use of barcodes and dispensing those to remote locations. This Time Specific Paper is included in these Proceedings.

Dr. Cynthia Johnson, United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), Centers for Epidemiology and Animal Health (CEAH), Center for Emerging Issues, on the Veterinary Services (VS) Atlas and Map Kiosk. The VS Atlas is a centralized spatial database with data on animal health for internal APHIS use. However, the source code is available to states to house state spatial data in a consistent format. The Atlas is built for access by both advanced and less-experienced Geographic Information System (GIS) users. Spatial data can be accessed either in a desktop version, which requires additional GIS software, or as an internet-based application, which only requires an internet browser for access. Available spatial layers are based on agricultural census data, data on current animal health status in the Generic Database, veterinary resource data and various surveillance data. They also include layers on topography, land cover, wildlife and insect population information as well as base layers like water, roads and administrative boundaries. For desktop-based GIS, data can be viewed, downloaded and analyzed. While analysis is not possible using the web-based VS Atlas products, maps can be created, printed, saved and e-mailed. VS Atlas data and output can be customized for different user groups. The Map Kiosk, which resides on a central server (a kiosk) that is configured for plotter printing and spatial database connections, provides a means

for emergency management personnel to generate standard daily incident management maps and premises spreadsheets quickly and easily. The tool is user friendly enough for a GIS novice, but powerful enough to handle the changing scope of incident management. The Map Kiosk gives emergency management personnel direct control of their routine daily mapping needs and allows the GIS Unit to concentrate on spatial data analysis and complex maps. The discussion following Dr. Johnson's presentation addressed concerns about data confidentiality that may prevent complete sharing of maps and the attached spreadsheet-based data. A time-tracking component is currently not built in, although daily updates will be available in incidents.

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 AHISC Co-Chairs also are Co-Chairs of the NAHRS steering committee. Dr. Stanley Bruntz, NAHRS Coordinator at the National Surveillance Unit (NSU) USDA-APHIS-VS presented the annual report on the status of the NAHRS. As of November 2005, 42 states are reporting to NAHRS, with several others finalizing reporting procedures. Consistency of state reporting continues to be strong as 92 percent of all participant states in 2004 reported for all 12 months (2 new states in 2004). The states participating in NAHRS account for 86 percent of the cattle, 66 percent of the swine, 90 percent of the sheep, 67 percent of the poultry and 84 percent of the catfish value of production for those commodities in the United States. Dr. Bruntz made NAHRS recruiting trips to Kansas, Missouri and Oklahoma in 2005. A NAHRS Online Reporting Application was developed and implemented in 2005. The NAHRS Online Reporting Application is designed to allow secure and confidential completion of NAHRS reporting on-line, and provide more timely and expanded information to participant states. Participant states have access to all of their own monthly reports, a state cumulative report for their state, and a national cumulative report. Currently 28 states are utilizing the NAHRS Online Reporting Application and 104 users are registered in the system. Dr. Bruntz presented changes to the World Organization for Animal Health (OIE) Reportable Disease list from May 2005 that affect the NAHRS Reportable Disease List. He proposed that revisions to the NAHRS Reportable Disease list coincide with changes to the OIE Reportable List. The proposed changes and their dispositions are presented in the business section at the end of this report.

Dr. Brian McCluskey, National Surveillance Unit (NSU) of the USDA-APHIS-VS-CEAH, laid out the progress made towards the construction of a National Animal Health Surveillance System (NAHSS). Sampling and data generation on-farm, at slaughter and at markets, with the support of the National Animal Health Laboratory Network (NAHLN), and according to strategies designed with supporting risk, pathway and threat analyses and modeling, are the foundation for detection of foreign and emerging animal diseases, and integration with detection of domestic diseases. The NSU is tasked with coordinating all surveillance activities and is designated to become the central site for animal health surveillance data and information. Staff at the NSU is developing standards for surveillance, data (categories and elements) and data storage, as well as standards for coordination between those three components. The standards document will be available for first review by the end of 2005. The standards manual will be a dynamic document. Contributions and comments are welcome from all members of the surveillance community. Dr. McCluskey also presented first steps in the implementation of the Classical Swine Fever (CSF) surveillance plan, including population-based passive reporting of suspicious CSF cases, laboratory-based surveillance of tissue submitted from sick pigs, and active surveillance of high risk swine in Florida, Texas and Puerto Rico. The NSU also has developed a surveillance evaluation process that reviews the structure of systems and processes as well as the quality and effectiveness of programs, which now has been used to complete the review of scrapie surveillance. Furthermore, NSU is analyzing Bovine Spongiform Encephalopathy (BSE) surveillance and has been charged with developing options for continued surveillance for BSE in the United States, utilizing the newly developed surveillance standards. Surveillance developments and activities will be publicized on a NAHSS website to be launched by the end of 2005. Planned activities for 2006 are the development of comprehensive foot-and-mouth disease and poultry disease surveillance plans, brucellosis surveillance evaluation, and continued work on surveillance standards.

"The ultimate goal of the National Animal Identification System (NAIS) is to have the capability to identify all animals and premises that had direct contact with a foreign animal disease (FAD) or disease of concern within 48 hours after discovery", NAIS Draft Program Standards. Health or disease status of

those animals and premises has to be reliably established and results of diagnostic tests have to be associated unequivocally with those animals and premises, requiring development and adherence to NAHLN identifier standards. Dr. Jim Case, California Animal Health and Food Safety Laboratory, University of California, Davis, presented philosophies underlying laboratory data acquisition and transfer, and the need for specific data formats used at the source to ensure efficiency and accuracy of data transfer and analysis. All participating laboratories have to produce standardized data and the NAHLN has to assist laboratories with initial data mapping, provide central terminology services, detailed guidelines for data transmission, and enforce strict data quality standards, ensuring data confidentiality and integrity and restricted access. Dr. Case emphasized that high quality data needs to originate from the source, without need for post-processing, which would allow real-time analysis. Data quality tends to be the weak link in an alert and response system, and increased quality, timeliness and accuracy of surveillance data results in more effective response and management of animal health emergencies.

Dr. Steve Weber, USDA-APHIS-VS-CEAH, presented an update on activities related to VS Information Systems and on future directions. Veterinary Services continues to work towards an integrated, web-based enterprise approach for data resulting from surveillance, disease control, emergency management, veterinary accreditation, importation and exportation of animals/animal products, national premises/animal identification and diagnostic laboratory information. Successes this year include finalization of a web-based approach for scrapie and chronic wasting disease (CWD), a monthly reporting approach involving validation for disease control programs, expansion of the Emergency Management Response System to include detailed cost information, completion of the Veterinary Accreditation system (a key module in the Veterinary Services Processes Streamlining system), increased functionality for assigning premises and animal identification, the procurement of a state-of-the-art Laboratory Information Management System for the National Veterinary Services Laboratories and implementation of the HL7 Version 2.6 message for the NAHLN system.

Dr. Bruce Akey, New York State Department of Agriculture and Markets, Division of Animal Industry, gave a brief presentation on the development and uses of Decision Support Systems (DSS) to better inform policy and operational decisions. In its simplest form it can be defined as any computerized, interactive system that supports decision making. A DSS can be communications-driven (e.g. phone messages, faxes, e-mails), document-driven (e.g. miles of files), knowledge driven (e.g. an "expert system"), model-driven (e.g. simulations of disease spread) or perhaps the most familiar, data-driven (e.g. database). Many state offices already have one or more databases that function as Decision Support Systems such as a disease program database, a Geographic Information System (GIS), a Laboratory Information Management System (LIMS) or perhaps the federal Generic Data Base (GDB). Usually each database is an operational database geared to ingesting data and producing a limited number of reports on the data in that database alone. Many times those reports are nothing more than a reconstitution of the investigation or report form that was the source of that data. Although some analyses may be carried out in each database, producing summary data for instance, usually there is no capability to conduct analyses of data integrated across databases, other than the integration and analyses conducted by the person(s) who read the separate reports. While such disconnected systems each provide pieces of the big picture, the ultimate formation of that picture still rests largely on the sometimes non-analytical and frequently undocumented interpretations of the end user. However, if these disparate databases are tied together through the implementation of a Data Warehouse (DW) with Data Marts constructed to pre-process data to facilitate the types of analyses that would be most useful for making decisions, new questions can be asked and answered, questions that more closely resemble the complex, adaptive systems approach needed to address disease control and emergency response. One example of such a question that can now be answered through integration would be "Does the passive surveillance represented by routine submissions to the state diagnostic lab adequately represent the cattle population as it is geographically distributed in the state?" Such an integrated system creates synergisms of information that contribute to a much more useful.

A discussion was held among attendees concerning issues being encountered by states trying to adapt information systems to accommodate the advent of the NAIS. Issues common to multiple states ranged from the simple addition of new data fields for premises and animal identifiers to the need to revise some of the NAIS data standards to be in line with other widely accepted standards for these data types. As a

result of the latter, a Working Group, chaired by Dr. Jim Case, was appointed to review the NAIS data standards and provide recommendations to be forwarded to the NAIS Working Group for consideration.

The proposed changes to the NAHRS reportable diseases list to make it consistent with the recent changes in the World Organization for Animal Health (OIE) notifiable diseases list were brought back before the committee for discussion and the changes were endorsed unanimously.

The committee also discussed the perceived lack of timely information on information systems developments with USDA-APHIS-VS and as a result, formulated the following recommendation:

“The Committee urges USDA-APHIS-VS to utilize Change Control Boards or other mechanisms during the development and implementation of Information Systems to encourage input from states and other stakeholders and facilitate interoperability with stakeholder systems. In addition, a communications mechanism for at least quarterly reporting to stakeholders on Information Systems development within Veterinary Services should be implemented and maintained.”

This recommendation was approved by the committee as a resolution, the resolution was forwarded to the Committee on Nominations and Resolutions.

A resolution was proposed to support the Global Initiatives in Veterinary Education of the American Association of Veterinary Medical Colleges. After discussion, the Committee voted unanimously to forward the resolution to the Committee on Nominations and Resolutions.

California Pilot Project

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Current surveillance and disease mitigation efforts are hindered by poor data quality and the lack of direct data sharing among project/taskforce partners. The California Pilot Project was developed specifically to combat these issues. When this project is completed it will provide the groundwork for future implementation of surveillance and mitigation efforts by streamlining data collection and facilitating information exchange. It is expected that significant resources will be freed from the burden of data entry and that those resources will be better utilized for more valuable work.

The project was sponsored based upon the lessons learned from the Exotic Newcastle Taskforce in California that wrapped up operations in late 2003. The complexity of managing a 300 person taskforce that was actively working on sample collection, testing, reporting across three separate organizations (and several departments within each organization) led to key problems related to data sharing, and data quality. With each organization entering their data separately, there were also problems when comparing the metrics and overall taskforce progress.

The California Pilot Project is a joint effort between the California Animal Health and Food Safety Laboratory (CAHFS) at UC Davis, the Animal Health branch of the California Department of Food and Agriculture (CDFA), and the Animal Health and Inspection Services (APHIS) branch of the United States Department of Agriculture (USDA). The AI and END (Avian Health) surveillance program in California will serve as the test environment to ensure that the designed solution achieves the goals of the project and functions as expected in the real-world.

The key goals for the project include:

- Development of a solution that reduces the number of data collection problems and generally improves the quality and the data collection efficiency.
- Once implemented the system should be able to function both as a standard surveillance and emergency taskforce system.
- The implemented system must expand to handle multiple surveillance and test data.
- The system will be designed to help improve the quality of data from the source (the field).
- The system will allow all necessary data collected in the field to be shared amongst all approved organizations without the need for manual data entry.
- They system will provide greater chain of custody assurance from a legal and diagnostic perspective.

The scope of the project includes equipping the 15 field collectors in the CDFA and USDA Avian Health Group (AHG) working out of Garden Grove, CA with field collection computer hardware and software that will facilitate the rapid and accurate collection of samples and data. These devices will share the collected information as needed with the diagnostic labs (CAHFS and NVSL), and will send the data to the primary information systems within CDFA and USDA. To assist in data entry and to further improve data quality, bar-coding will be implemented as identifiers for samples collected and for cases submitted. Tablet PC's, Web applications, and Digital Paper solutions are being tested as part of the project. In addition standardized messaging and terminology (HL7, LOINC, and SNOMED) are being implemented as part of this project.

This project builds upon the efforts of the NAHLN laboratory results project; the BSE surveillance program; and individual efforts made by various State and Federal programs.

The initial testing of the design has been completed as of late October, and actual deployment is planned for December 2005. At the end of this project a report will be circulated that includes all lessons learned.