

SWINE HEALTH

Title: Linking veterinary diagnostic laboratory submissions and corresponding PEDV test results to spatiotemporal mapping tools: the future of disease management, control and elimination – NPB13-233.

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Scientific Abstract:

Managing, monitoring, and maintaining the health status of US swine has become increasingly complex. The continued expanse of today's multisite pig production systems; extensive pig movement within and across broad geographic regions of US and Canada; a growing list of emerging and reemerging diseases of local, regional, and national significance; diagnostic data being derived from any number of veterinarians, veterinary clinics, production systems, and veterinary diagnostic laboratories; and a growing appreciation for the effect that the health status of a region, pig-flow, or production system has on the biological and financial performance of pork production operations have each contributed to a need for improved systems (or intercommunicative networks) capable of effectively collating, managing, summarizing, and securely communicating information pertaining to the health status of swine herds. A primary aim of our highly collaborative efforts has been to develop a broadly applicable and streamlined system for linking veterinary diagnostic laboratory submissions, corresponding test results, attending veterinarian insight, and an interpreted health status of farm sites to an exceptionally capable spatiotemporal disease management tool (Disease BioPortal[®], University of California – Davis, <http://bioportal.ucdavis.edu/>) for use in area-regional, veterinary clinic, or production system specific swine health monitoring and disease control initiatives. Partnering with three different producer groups (pilot participants) enabled access to the premises-specific information and corresponding flow of diagnostic information needed to evaluate and trouble-shoot the performance and functionality of the systems and web-based animal health information management tools being developed. These efforts have led to the development of a suite of complementary methodologies and web-based tools (Animal Health Information Management Network, Figure 1) that will provide producers a new system for monitoring and maintaining the health status of swine farms in their practice, region, or production system over time. While the focus of this animal health information management network development project has initially concentrated on porcine diseases, specifically PEDV, PDCoV, and PRRSV; the tools developed can be readily adapted to and used across

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any number of pathogens, livestock species, and laboratories in the National Animal Health Laboratory Network. Moving forward, the Iowa State University Department of Veterinary Diagnostic and Production Animal Medicine (in collaboration with the University of California-Davis, participating VDLs, and GlobalVetLINK) plans to continue to enhance the capabilities of the network and pilot a service whose aim is to support the efforts of veterinarians, veterinary clinics, and/or production systems interested in using this suite of web-based applications to monitor and maintain the health status of swine farms in their practice, region, or production system over time. Additionally, through collaborations with the USDA National Animal Health Laboratory Network and peer veterinary diagnostic laboratories in the National Animal Health Laboratory Network (e.g., Iowa State University Veterinary Diagnostic Laboratory, Kansas State University Veterinary Diagnostic Laboratory, South Dakota State University Animal Disease Research and Diagnostic Laboratory, and the University of Minnesota Veterinary Diagnostic Laboratory); the tools and systems of inter-laboratory connectivity being further developed in the Animal Health Information Management Network were used to establish a web-based dashboard of time and space sensitive graphics in Disease BioPortal® that depict the national and state level trends in case level PEDV and PDCoV PCR test results observed in case submissions made to VDLs and reported to the USDA. These efforts may well represent the first working example in US history whereby aggregate diagnostic data has been electronically captured from all of the VDLs located throughout the US and seamlessly integrated into an interactive web-based summary of national and state level diagnostic trends. Collectively, this suite of novel methods, web-based tools, and systems of inter-laboratory connectivity being advanced and further developed hold promise for helping create a step-wise improvement for both producer group specific and larger-scale (aggregate data) swine health monitoring applications. The continued development and use of the next generation of animal health information management tools (e.g. such as Animal Health Information Management Network described in this report) for routine private enterprise applications are unquestionably necessary to create the systems of connectivity and web-based analytics needed to enhance the US pork industry’s overall capabilities and preparedness for managing endemic, emerging, and/or transboundary diseases of high consequence.

Figure 1. Animal health information management network.

