

### Center for Epidemiology and Animal Health Impact Report FY 2021



**Mission**: The Center for Epidemiology and Animal Health (CEAH) provides applied and innovative analyses to generate science-based information and solutions for decision making around complex national animal health issues.

### CEAH is made up of the following units:



### Program Coordination and Implementation (PCI)

PCI carries out CEAH's mission by supporting staff with project management, operations and logistics assistance, and compliance with the Confidential Information Protection and Statistical Efficiency Act (CIPSEA) and the Paperwork Reduction Act (PRA).



### National Animal Health Monitoring System (NAHMS)

NAHMS is the statistical unit within Veterinary Services responsible for population estimates related to animal health management and productivity. NAHMS conducts national studies on the health and health management of livestock, equine, aquaculture, and poultry populations within the United States at regular intervals.



### **Domestic Animal Health Analytics (DAHA)**

DAHA supports domestic disease programs through risk analysis and epidemiologic evaluations and provides indemnity and compensation analyses and tools.



### Surveillance Design and Analysis (SDA)

SDA develops and enhances animal disease surveillance through collaborative surveillance design, analysis, evaluation, and communication. SDA provides practical and timely surveillance solutions to meet customer needs, from single-premises sampling plans to robust national-level surveillance systems, including the proposed National List of Reportable Animal Diseases. SDA also serves as the OIE Focal Point for U.S. animal disease reporting.



### Transboundary Disease Analytics (TDA)

TDA identifies and characterizes global animal health hazards, assesses hazards and strategies to prevent entry of transboundary diseases into the United States, conducts pathways assessments, and contributes to animal disease preparedness and response planning, implementation, and evaluations.



### Geospatial Analytics, Products, and Services (GAPS)

GAPS provides map-centric products and solutions, as well as geospatial analyses that support emergency planning and response, disease risk analyses, epidemiology investigations, disease monitoring and reporting, and the overall mitigation and prevention of animal disease introduction and spread in the United States.



### **Program Support and Communications (PSC)**

PSC provides communication support through planning, resource management, product design and development, and library and reference support.

## **CEAH Portfolios**







Foreign Animal Disease (FAD) Prevention-Mitigation



Domestic Animal Disease Mitigation



Foreign Animal Disease Response Planning and Implementation

### **Goals for CEAH Portfolios**



Provide focus for CEAH's strategic planning efforts



Coordinate and prioritize workloads and projects within and across CEAH units



Improve CEAH's ability to manage a complex array of projects and services



# Monitoring and Trends

Activities produce data and products characterizing:

- Distributions of Disease, Host, or Vector Data
- Animal Health Management and Biosecurity
- Industry Trends
- Antimicrobial Use and Stewardship

Enhanced APHIS partnerships with the National Bison Association, Tribal representatives, universities, and other

**stakeholders.** Planning the industry-requested NAHMS Bison 2022 Study provided opportunities to enhance important APHIS partnerships. Study results will provide updated and trend data on bison health, nutrition, health management practices, and disease and emergency preparedness. Biologic testing results will inform participating producers about pasture forage quality as well as gastrointestinal parasites, anthelminthic resistance, and enteric microbes in their bison.

**Contributed to international expertise on animal health issues.** As an OIE collaborating center, CEAH provides support to the OIE and its members. By completing the annual OIE report, CEAH provided transparency on its work in disease control, surveillance, epidemiology, risk assessment, modeling, training, capacity building, wildlife, avian diseases, and aquatic animal diseases, and amplified its impacts.

Fulfilled our national and international responsibilities as an OIE member country to preserve safe trade, public health, food security, and sustainable socio-economic growth. By submitting immediate, follow-up, and semesterly disease reports in the new OIE WAHIS reporting system, APHIS met its international reporting responsibilities.



#### Ensured that VS field data collection for NAHMS feedlot and swine studies meets the information needs of VS stakeholders.

NAHMS personnel collaborated with industry and universities to design the studies, and then trained data collectors and coordinated electronic data collection. Electronic data collection, used for the first time by NAHMS, is laying a foundation for more effective and efficient future data collection.



Provided stakeholders with easier access to NAHMS study data through dynamic dashboards for the Antimicrobial Use in Swine 2017, 2020 Sheep Death Loss, and annual bulk tank somatic cell count data. This online format presents the significant study results in a convenient and interactive way.

Ensured that data collection to support industry information needs followed the laws protecting the public from burdensome data collection. By developing and submitting eight Paperwork Reduction Act packages for customers in CEAH, VS, and APHIS, CEAH ensured collections provide high quality data while protecting the public's privacy and time.

# Strengthened partnerships with industry to collect and analyze data critical to improving antimicrobial stewardship. A

collaboration between Pipestone Veterinary Services and CEAH provides an opportunity to collect detailed on-farm data while improving producers' awareness to optimize antimicrobial use and may serve as a model for future studies to monitor antimicrobial use and resistance.

Enhanced access and use of NAHMS study data by industry stakeholders. By creating targeted infographics on the Goat 2019, Beef 2017, Bulk Tank Somatic Cell Count Monitoring studies, and a Sheep Industry Needs Assessment, CEAH highlighted key study results in brief, user-friendly summaries.



# Domestic Animal Disease Mitigation

Activities include:

- Epidemiologic and Ecologic Analysis
- Surveillance Design and Evaluation
- Economic Analysis
- Evaluation of Domestic Animal Health Strategies

### Increased transparency, consistency, and flexibility for USDA and industry when conducting indemnity

**valuations.** CEAH worked to harmonize a fair-market value approach for estimating animal values across USDA agencies and posted these values online. We also developed data standards for appraisals and a list of interested and qualified, independent, third-party livestock and poultry appraisers.

### Helped protect livestock health and mitigate the spread of brucellosis beyond the Greater Yellowstone Area.

CEAH analysts validated current screening methods for brucellosis by determining the difference between the Fluorescent Polarization Assay (FPA) plate and FPA tube screening tests. This assessment found that FPA plate testing is a valuable screening tool but should be followed by FPA tube testing as currently recommended. FPA testing will remain an important brucellosis screening tool to lessen disease spread.



Supported the livestock industry and saved taxpayer dollars by enhancing tools used to avoid herd depopulations for bovine TB when they may not be necessary. CEAH updated the VS epidemiological-economic model for

controlling bovine TB following outbreaks in U.S. herds. This tool helps VS better manage bovine TB-affected herds by evaluating the circumstances surrounding each herd.



Provided information to assure producers and trading partners that disease control efforts will be effective in protecting U.S. swine from disease spread by feral swine. CEAH completed work to determine feral swine home range size across North America for use in response planning and international negotiations. Feral swine home range information is essential in predicting the potential spread of swine diseases and the scale of response needed for control.

**Created tools to enhance APHIS resource planning and stewardship of taxpayer dollars.** Assisted VS managers and staff with expanded web-based map applications and tools in the APHIS GIS Portal for disease reporting, resource planning, and emergency response. CEAH GAPS staff provided training and technical support for the Portal, which hosts web maps and applications.

Ensured that USDA's surveillance programs for bovine brucellosis and tuberculosis continue to support market confidence in the health of U.S. cattle. CEAH updated national surveillance plans for bovine brucellosis and tuberculosis, including a plan for unique livestock species in Texas.

#### Provided tools to improve cattle fever tick control and eradication efforts, helping to protect producers from potential economic losses. CEAH

conducted epidemiologic and spatial analysis to predict infestation times and effectiveness of surveillance for cattle fever tick.



# Foreign Animal Disease Prevention-Mitigation

### Activities include:

- Surveillance Design and Evaluation
- Global Monitoring and Situational Awareness
- Risk Analyses
- Evaluation of FAD Mitigation/Control Options

**Informed U.S. protections against ASF to help safeguard the U.S. swine herd.** CEAH assessed possible ASF pathways of virus entry and mitigations between Dominican Republic and Puerto Rico and between Puerto Rico and the mainland United States. This assessment supported the new OIE-recognized ASF protection zone in Puerto Rico and the U.S. Virgin Islands.



Informed APHIS' proposed changes to 9 CFR Part 96 related to imported swine casings from countries known to be affected with ASF virus. CEAH evaluated whether evidence of inactivation of ASF virus in pig intestines by the brining (salting) process was sufficient to allow imports. This analysis supported the APHIS decision to accept the brining of casings under specified conditions as an effective mitigation for ASF. This will not only open and expand trade with other countries but also allow APHIS to maintain market access for U.S.-origin hog casings should an ASF outbreak occur in the United States.

Ensured that U.S. surveillance for swine hemorrhagic diseases is meeting its objectives to strengthen detection capability and enhance the nation's outbreak preparedness. CEAH evaluated the integrated ASF-CSF surveillance plan and outlined areas for improvement. A summary of the evaluation was published on the APHIS website.



Improved data accessibility, program transparency, and engagement for APHIS stakeholders. CEAH collaborated to develop an interactive online dashboard that tracks ASF-CSF surveillance efforts in the United States.

Increased efficiency and reduced the time needed to compensate producers for removing virus in swine facilities, enabling a quick return to business and safe international trade should an ASF outbreak occur. CEAH determined the estimated compensation rates for virus-removal practices in facilities with group-housed hogs and individually housed hogs.

### Collaborated to protect and improve the health, quality, and marketability of the U.S. aquaculture industry.

Analyzed risks of four aquaculture diseases that could cause production losses, higher costs for treatment and disease control, and loss of trade or markets. CEAH completed assessments for red seabream iridoviral disease; infectious hypodermal and hematopoietic necrosis virus; virulent Aeromonas hydrophila in farmed catfish; and decapod iridescent virus. These assessments provided information needed to identify opportunities to control disease. The U.S. aquaculture industry is worth approximately \$1.5 billion USD and supports 1.7 million jobs.



## Foreign Animal Disease Response Planning and Implementation

Activities include:

- Improving FAD Response Plans
- Assisting in Response Efforts
- Geospatial Map Applications
- Supporting Training Exercises

### Improved ASF outbreak preparedness and supported emergency response

**planning.** Updated USDA's ASF Response Plan Red Book with a new chapter on ASF surveillance.

## Optimized ASF monitoring efforts and helped safeguard the U.S. swine herd.

Developed an enhanced surveillance plan for Puerto Rico following ASF detection in Dominican Republic, supporting the establishment of an OIE-recognized Protection Zone.



### Informed approaches to reduce economic losses resulting from a foot-and-mouth disease (FMD)

**incursion.** CEAH used epidemiological modeling to evaluate strategies to control FMD spread. This work helped identify practical responses in case of FMD outbreaks in large cattle feedlots.

### Supplied outbreak information to State animal health officials and the agricultural industry to help stop new incursions and outbreaks. CEAH

delivered geospatial and map products for multiple animal disease events, including rabbit hemorrhagic disease virus, cattle fever tick control in Puerto Rico, and global ASF monitoring and reporting. Helped the National Veterinary Stockpile ensure adequate resources are available for animal disease emergency response.

CEAH helped estimate the levels of personal protective equipment needed by responders to ASF and highly pathogenic avian influenza outbreaks. Estimates were informed by modeling disease transmission scenarios.



### Aided in building USDA's strategic surveillance framework and early warning system for SARS-CoV-2 to help prevent or limit the next global

**pandemic.** CEAH developed surveillance strategies for mink farms as part of the Mink SARS-CoV-2 Transmission Avoidance and Monitoring Program and supported ongoing SARS-CoV-2 planning and response efforts across species.

Helped VS use accurate data during disease response by decreasing map production time during outbreaks and animal disease events. Collaborated with the VS Center for Informatics to better use data streams in the Data Integrated Services system. Data workflows were designed to be reusable and aid in geospatial and other analyses related to epidemiology, surveillance, and disease risk identification.



# Other Acccomplishments

• Significant CEAH accomplishments in FY 2021 that are not categorized into a portfolio

### Assisted with Federal COVID vaccination efforts—President Biden's #1 priority for Federal employees. CEAH

deployed 21 staff members to seven different locations to help with vaccinations. This number represented nearly a third of CEAH's total staff. In all, CEAH contributed 92 weeks of deployed time to this program.

Increased efficiency of VS emergency planning and response by enhancing access to diverse GIS Portal map applications and tools for mapping, analytics, and disease reporting. CEAH guided VS users to locate and navigate the APHIS GIS Portal through the VS Geospatial Landing Site, a user-friendly web page. The Landing Site guides users searching for maps by commodity or an emergency event.



## Enhanced CEAH customer service and supplied more timely information.

CEAH developed a Program Tracker that will enhance resource management by enabling CEAH users to manage ongoing projects and better communicate work progress to stakeholders.



#### Assisted CEAH customers and staff by increasing efficiency and transparency. By creating a standardized process for project intake with a customer-focused approach in targeting the product to the right audience, CEAH will decrease time to product delivery. This workflow contributes to the project management system, a digital interface that offers key management tools to leadership, such as staff obligation rates and an overall scope of CEAH's commitments.

## Increased access to information on CEAH products in review and clearance.

CEAH created a new system to simplify the tracking of CEAH documents and provided guidance to staff on review and clearance processes. This new system moves documents more quickly through approval by increasing visibility for all on the status of documents.

### Improved access to critical information needed by CEAH staff to deliver timely analyses used by VS and industry

**decision-makers.** CEAH's librarian conducted over 140 literature searches and completed over 600 document delivery services. This work supplied essential background on specific diseases as well as current surveillance, detection, testing, and mitigation measures.

https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/SA-Epidemiology-AnimalHealth-CEAH