

# WOAH Collaborative Centre Reports Activities 2022

## Activities in 2022

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### Centre Information

<b>Title of WOAHCollaborating Centre</b>	Center for Epidemiology and Animal Health
<b>Address of WOAHCollaborating Centre</b>	2150 Centre Ave, Building B, Fort Collins, CO 80526
<b>Tel.:</b>	970-494-7302
<b>E-mail address:</b>	AAPG-VS-CEAH@usda.gov
<b>Website:</b>	<a href="https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/SA-Epidemiology-AnimalHealth-CEAH">https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/SA-Epidemiology-AnimalHealth-CEAH</a>
<b>Name Director of Institute (Responsible Official):</b>	Amy Delgado
<b>Name (including Title and Position) of Head of the Collaborating Centre (WOAH Contact Point):</b>	Amy Delgado, Director
<b>Name of the writer:</b>	Bill Kelley

### TOR1 AND 2: SERVICES PROVIDED

1. Activities as a centre of research, expertise, standardisation and dissemination of techniques within the remit of the mandate given by WOAHC

Zoonoses	
Title of activity	Scope

Summaries of Current SARS-CoV-2 scientific articles	Center for Epidemiology and Animal Health (CEAH) staff reviewed and provided summaries of current SARS-CoV-2, COVID-19 scientific articles addressing new findings related to animals, the virus, variants, vaccines, host response, transmission, and treatments that are included in the weekly USDA APHIS COVID-19 Internal Situation Updates.
Disease Control	
Title of activity	Scope
Temperature mitigations for potential tick species in imported hay bale products	Animal Products Imports and Exports (APIE) staff researched if temperatures used during the drying process of hay bale products will effectively kill all life stages of ticks of veterinary concern that may be imported into the United States. Activities included improving data on vector borne animal diseases to better guide risk assessments, determining if temperatures used during the drying process of hay bale products will effectively kill all life stages of ticks of concern, creating a literature reviewed summary of information including issues related to processing grass hay, cubes, and pellets; and a review of epidemiology, hosts, and vectors of East Coast Fever and Heartwater.
Disease Control	
Title of activity	Scope
African Swine Fever (ASF) article	CEAH staff provided ASF information, insight, and guidance for the publication of a Customs and Border Patrol (CBP) article "No Entry: How CBP is fighting to keep African swine fever out of the United States."
Disease Control	
Title of activity	Scope
Reported U.S. prevalence of scrapie resistant genotypes in goats	Meeting between United States Department of Agriculture (USDA) and Agri-Food Canada (September 21, 2022) to discuss import/export requirements and current knowledge of scrapie genotyping in goats. Included a presentation of the National Animal Health Monitoring Service (NAHMS) Goat 2019 results on U.S. prevalence of goat scrapie resistance associated genotypes and discussion of study design.
Disease Control	
Title of activity	Scope
The importance of livestock demography and infrastructure in driving foot-and-mouth disease (FMD) dynamics	CEAH staff conducted an analysis investigating the impact of changing FMD model assumptions about premises transmission behavior, both by including within-herd dynamics and by accounting for premises type and increasing the accuracy of shipment predictions.
Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
National Bovine	CEAH staff published updates to the National Bovine Brucellosis Surveillance Plan, addressing items identified

<p>Brucellosis Surveillance Plan</p>	<p>in the 2018 surveillance plan evaluation and taking into consideration data evaluated since that evaluation. The surveillance plan will specify brucellosis surveillance targets and goals, information that is included in the updated Program Standards and Rule documents. <a href="https://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/downloads/nat_bruc_surv_plan.pdf">https://www.aphis.usda.gov/animal_health/animal_diseases/brucellosis/downloads/nat_bruc_surv_plan.pdf</a></p>
<p>Epidemiology, Surveillance, Risk Assessment</p>	
<p>Title of activity</p>	<p>Scope</p>
<p>Epidemiologic and Other Analyses of HPAI Affected Poultry Flocks: July 1, 2022 Report</p>	<p>CEAH staff published a report with the description of the outbreak, comparison of 2022 HPAI outbreak to 2014/2015 outbreak, phylogenetic analysis and diagnostics (NVSL), case series epidemiologic study, estimating disease spread with the National HPAI Disease Spread Model, time to introduction model in partnership with University of Minnesota, AIV transmission at the wild bird:domestic bird interface in partnership with United States Geological Survey (USGS)/University of Maryland (UMD), AIV surveillance in wild birds (Wildlife Services), and analysis of correlation of eBird and BirdCast public tools.</p>
<p>Epidemiology, Surveillance, Risk Assessment</p>	
<p>Title of activity</p>	<p>Scope</p>
<p>National FMD disease-spread and control model</p>	<p>CEAH staff updated the baseline FMD national disease-spread and control model.</p>
<p>Epidemiology, Surveillance, Risk Assessment</p>	
<p>Title of activity</p>	<p>Scope</p>
<p>African Horse Sickness: Potential Transboundary Pathways of Entry into the United States</p>	<p>CEAH provided pathogen hazard Identification and description of potential pathways of entry for African Horse Sickness into the United States.</p>
<p>Epidemiology, Surveillance, Risk Assessment</p>	
<p>Title of activity</p>	<p>Scope</p>
<p>National HPAI disease-spread model</p>	<p>CEAH staff provided multiple modelling tasks requested during the outbreak: 1) Forecast geographic locations for future HPAI detections – national level. 2) Forecast geographic locations for future HPAI detections – state/county level. 3) Estimate severity and duration of outbreak to inform budget/funding requests. 4) Estimate detections among specific operation types to inform budget/funding requests.</p>
<p>Epidemiology, Surveillance, Risk Assessment</p>	
<p>Title of activity</p>	<p>Scope</p>
<p>WOAH Risk Assessment Conference</p>	<p>WOAH requested CEAH prepare a Risk Analysis Conference. Conference materials focused on methods and tools used to develop risk assessments/analyses using the WOAH Risk Assessment/Analysis framework and ensuring that appropriate resources and information are available for animal disease response.</p>

Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
Phase 1 Scrapie Incentive Program Summary	CEAH staff supported publication of the first scrapie incentive program phase including tables with the new incentive credits based on ages and clinical signs. This document serves to educate and summarize the scrapie incentive program for producers, States, Veterinary Services (VS) personnel, and other stakeholders. <a href="https://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/downloads/phase1-scrapie-incentive-program.pdf">https://www.aphis.usda.gov/animal_health/animal_diseases/scrapie/downloads/phase1-scrapie-incentive-program.pdf</a>
Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
HPAI parameter document expressing disease-spread parameters	CEAH-developed HPAI parameter document is available for sharing with internal/external collaborators. Includes development of a hybrid indirect contact parameter set combining higher and lower risk indirect contact parameters into a single indirect contact parameter for each avian operation type.
Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
Piloting an Antimicrobial Use (AMU) and Antimicrobial Resistance (AMR) monitoring program for pig production in the United States	CEAH staff collaborated on the development of a public-private partnership with the Pipestone Veterinary Services to study antimicrobial use and resistance related to animal health and production-related indicators in large-scale swine production. A manuscript describing year one findings from a subset of this work has been tentatively accepted to WOA's Scientific and Technical Review for publication in 2023. This collaboration could serve as a model for future studies to monitor antimicrobial use and resistance using detailed on farm data, while supporting improved situational awareness of producers to optimize antimicrobial stewardship.
Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
Improvement of antimicrobial resistance bacteria detection in swine	CEAH partnered with the Agriculture Research Service (ARS) U.S. Meat and Animal Research Center to complete analysis for a project that examines improvement of antimicrobial resistance bacteria detection along the farm to fork continuum in swine production.
Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
Evaluation of sampling methods for detecting	CEAH completed data collection and sample processing for this interagency workplan in FY22. Analysis and manuscripts are in progress and publications are anticipated in FY23. This work was conducted in response to

Salmonella and characterizing antimicrobial susceptibility of Salmonella and E. coli in swine	the U.S. National Action Plan for Combating Antibiotic-Resistant Bacteria results to help inform the design of swine production site antimicrobial resistance monitoring programs with the goals of reducing the burden associated with sampling while increasing understanding of antimicrobial resistance of Salmonella and E. coli.
Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
National Animal Health Monitoring System (NAHMS) Bison 2022 study	CEAH collaborated with the National Agricultural Statistics Service (NASS) to contact bison operations in 50 states and requested their participation in a national study of U.S. bison health and management. This is the second national study of U.S. bison operations, but the first in which fecal and forage samples are being collected. The fecal samples will provide data on the prevalence of gastrointestinal parasites and fecal microbes. Winter pasture nutritional content will be examined from the forage samples. Data collection continues into 2023.
Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
Large Enterprise Swine 2021 study	CEAH completed data collection in 13 states in March 2022 as part of the Large Enterprise Swine 2021 study. Producers were provided with results from enteric microbial testing conducted at North Carolina State University (NCSU). Oral fluids were collected to test for Seneca Valley Virus.
Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
2022 U.S. National Animal Health Reporting System (NAHRS) Reportable Diseases, Infections, and Infestations List	CEAH published the updated United States list of reportable animal diseases for 2022 to inform stakeholders of current reportable diseases.
Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
Descriptive analysis of multiple swine movement networks and the development of a network model to	CEAH has collaborated with NCSU to develop a model of ASF spread based on U.S. producer data. This model was used to evaluate the efficacy and estimate the resource demands of an outbreak response. This work is in

<p>estimate the impacts of movement restrictions under the USDA APHIS ASF Response Plan: The Red Book (April 2020)</p>	<p>pre-print publication in bioRxiv: <a href="https://www.biorxiv.org/content/10.1101/2022.09.04.506538v1">https://www.biorxiv.org/content/10.1101/2022.09.04.506538v1</a></p>
<p>Epidemiology, Surveillance, Risk Assessment</p>	
<p>Title of activity</p>	<p>Scope</p>
<p>Outbreak surveillance optimization using within-herd spread models</p>	<p>CEAH has collaborated with the University of Minnesota to develop a within-herd ASF spread model, which is used to evaluate surveillance scenarios to optimize outbreak response planning. Two manuscripts have been published describing this model, and numerous conference presentations and workshops have been held using the model to communicate with stakeholders about surveillance concepts, optimizing surveillance strategies, and the value of targeted surveillance.</p>
<p>Epidemiology, Surveillance, Risk Assessment</p>	
<p>Title of activity</p>	<p>Scope</p>
<p>Enhanced African Swine Fever Surveillance: The Establishment of a United States Protection Zone</p>	<p>USDA established the first ever WOAHA recognized foreign animal disease (FAD) protection zone (PZ) in Puerto Rico (PR) and the United States Virgin Islands (USVI). To meet WOAHA guidance within the PZ, the USDA implemented a comprehensive outreach and education campaign, biosecurity and sanitary measures, movement restrictions on swine and swine products, and an enhanced active surveillance plan.</p>
<p>Epidemiology, Surveillance, Risk Assessment</p>	
<p>Title of activity</p>	<p>Scope</p>
<p>2021 Equine Infectious Anemia Cases in the United States report</p>	<p>CEAH published an annual report of 2021 equine infectious anemia cases and testing that occurred in the United States. <a href="https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/2021-eia-report.pdf">https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/2021-eia-report.pdf</a></p>
<p>Epidemiology, Surveillance, Risk Assessment</p>	
<p>Title of activity</p>	<p>Scope</p>
<p>National Swine, Cattle, and Poultry Condemnation weekly reports</p>	<p>CEAH staff produced and shared within VS and Food Safety and Inspection Service (FSIS) the National Swine, Cattle, and Poultry Condemnation weekly reports. The main purpose of these reports is to describe, visualize, and summarize FSIS slaughter condemnation data on a weekly basis by swine, cattle, and poultry subclass, reason for condemnation, and geographic catchment basin to compare patterns over time.</p>

Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
Influenza A Virus in Swine Surveillance Fiscal Year 2022 quarterly reports	CEAH produces these reports to provide a brief update on the status of the national surveillance for Influenza A Virus (IAV) in swine for producers, swine practitioners, diagnosticians, and the public. <a href="https://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/downloads/fy2022quarter3swinereport.pdf">https://www.aphis.usda.gov/animal_health/animal_dis_spec/swine/downloads/fy2022quarter3swinereport.pdf</a>
Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
Comprehensive and Integrated Surveillance Systems Information Technology Advisory Board	CEAH cochaired the Comprehensive and Integrated Surveillance Systems Information Technology Advisory Board, prioritizing IT enhancement requests and considering project proposals throughout the year.
Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
2021 Summary of West Nile Virus Equine Cases in the United States report	CEAH published an annual report of 2021 West Nile Virus equine cases that occurred in the United States. <a href="https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/2021-wnv-report-summary.pdf">https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/2021-wnv-report-summary.pdf</a>
Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
2021 Summary of Eastern Equine Encephalitis Cases in the United States report	CEAH produced an annual report of 2021 Eastern Equine Encephalitis cases that occurred in the United States. <a href="https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/2021-eee-report-summary.pdf">https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/2021-eee-report-summary.pdf</a>
Training, Capacity Building	
Title of activity	Scope
Training on proper use of Avian Influenza Reporting Tool	CEAH provided training to State co-operators on how to use a new data reporting tool for reporting avian influenza testing and interactive reports. This helps improve standardization of data reported.
Training, Capacity Building	

Title of activity	Scope
National FMD Exercise outcome analyses	CEAH staff prepared outcome analyses to identify premises for non-scripted spread and potential tracing in support of the FADSAFE National FMD Exercise.
Training, Capacity Building	
Title of activity	Scope
Training and Exercise Plan outbreak surveillance training workgroup	CEAH developed and delivered training on the development of a disease surveillance sampling plan using the VS Outbreak Surveillance Toolbox.
Training, Capacity Building	
Title of activity	Scope
WOAH Risk Analysis Course materials	CEAH developed WOAHA course materials for virtual Risk Analysis Course presentation.
Wildlife	
Title of activity	Scope
Adaptive Risk-based Targeted Surveillance for Foreign Animal Diseases at the Wildlife-livestock Interface article	CEAH staff provided support for article that describes how the adaptive risk-based surveillance framework is applied to surveillance in feral swine in the U.S. with the objective of early detection of classical swine fever, ASF, and FMD. Personnel assisted in ensuring that appropriate resources and information are available for animal disease response and provided Domestic Animal Health Analytics staff input to issues related to animal disease prevention and control. <a href="https://pubmed.ncbi.nlm.nih.gov/35490290/">https://pubmed.ncbi.nlm.nih.gov/35490290/</a>
Avian Diseases	
Title of activity	Scope
H5N1 Risk Interface Model: Wild Birds to Domestic Poultry	CEAH collaborated with USGS/UMD for public facing risk interface retrospective spatial temporal model from wild waterfowl to domestic poultry across the continental United States for the full annual cycle.
Avian Diseases	
Title of activity	Scope



HPAI case definition updated	CEAH updated the HPAI case definition to inform stakeholders and regulatory partners about what is considered a confirmed positive case of HPAI.
Aquatic Animal Diseases	
Title of activity	Scope
Infectious Hypodermal and Hematopoietic Necrosis Virus in the United States: Rapid Risk Assessment report	CEAH produced the infectious hypodermal and hematopoietic necrosis virus (IHHNV) hazard identification and summary of potential pathways of entry and exposure. <a href="https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/ihhnv-pathways-assessment.pdf">https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/ihhnv-pathways-assessment.pdf</a>
Aquatic Animal Diseases	
Title of activity	Scope
Decapod Iridescent Virus (DIV1) Rapid Risk Assessment report	CEAH produced an assessment of pathways of entry and exposure of farmed shrimp to DIV1. <a href="https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/div1-rra.pdf">https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/div1-rra.pdf</a>
Epidemiology, Surveillance, Risk Assessment	
Title of activity	Scope
CEAH collaboration with California Department of Food and Agriculture (CDFA)	CEAH collaborated with CDFA throughout the NAHMS Goat 2019 study to ensure data collected would meet California's legal obligations to collect antimicrobial use data on goat operations. Custom data tables on dairy goat health and management, goat diseases, and antimicrobial stewardship were created and provided to CDFA for use in their annual reporting in 2022.

## TOR3: HARMONISATION OF STANDARDS

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the main focus area for which you were designated

Proposal title	Scope/Content	Applicable area
Establishment of WOAHProtection Zone for ASF: Puerto Rico and U.S. Virgin Islands	The USDA, with the support of CEAH subject matter experts, developed and submitted a dossier to WOAHP establishing an ASF protection zone for Puerto Rico and the U.S. Virgin Islands.	health management Wildlife health and biodiversity

Targeted ASF Surveillance Program	CEAH analyzed destination of pork products in air passenger, mail, and cargo for use in a domestic feral swine surveillance program and the targeted ASF surveillance program.	health management Wildlife health and biodiversity
National List of Reportable Animal Diseases presentation to State/Federal/ industry partners	CEAH presented updates on the National List of Reportable Animal Diseases at the annual meeting of the United States Animal Health Association (USAHA) as part of the USAHA/American Association of Veterinary Laboratory Diagnosticians Committee on Animal Health Surveillance and Information System.	health management
Good Aquaculture Practices (GAQP) training	CEAH collaborated with U.S. Food and Drug Administration (FDA)/Joint Institute for Food Safety and Applied Nutrition to develop training materials on biosecurity, surveillance, and food safety for the international shrimp industry. The course was delivered in Ecuador, India, and Indonesia in 2022. VS participated remotely.	health management
Routing Web-based Map Application	CEAH staff developed a Routing Web-based Map Application that enables industry to develop safe routes around restricted zones in place due to the HPAI outbreak in the United States. This tool provides authoritative data on HPAI zones and allows industry to meet this requirement to bypass 10km zones around infected premises when moving poultry products from the United States into Canada. The Routing application requires a secure login to the Geographic Information System (GIS) portal where industry users can develop and share planned routes with health certificate staff. The application was also enhanced with live weather data to better inform route planning.	health management

4. Did your Collaborating Centre maintain a network with other WOAHA Collaborating Centres (CC), Reference Laboratories (RL), or organisations designated for the same specialty, to coordinate scientific and technical studies?

Yes

Name of OIE CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
QUADS Epi-Team Meetings	Virtual	Americas Asia and Pasific Europe	The QUADS Epi Team meets bimonthly to share information on disease control approaches, modeling, and surveillance.

<p>FMD virus serotype C analysis to determine confidence in the potential global extinction of this serotype</p>	<p>France</p>	<p>Europe</p>	<p>CEAH completed this analysis in response to a request through collaborators at the FAO and Pirbright Institute. The analysis focused on available global surveillance data from 6 of the 7 FMDV regional virus pools and provided measures of detection to inform a status update on FMDV serotype C. The completed analysis was presented at the Open Session EuFMD conference in October 2022.</p>
<p>Collaboration with University of Minnesota Center for Animal Health and Food Safety</p>	<p>United States</p>	<p>Americas</p>	<p>CEAH collaborated to develop swine surveillance approaches for ASF in the United States and in Caribbean countries affected with ASF, including a publication titled "Enhancing passive surveillance for African swine fever detection on U.S. swine farms."</p>
<p>Collaboration with US Geological Service and University of Maryland</p>	<p>United States</p>	<p>Americas</p>	<p>CEAH staff provided avian influenza outbreak data and subject matter expertise for an analysis of avian influenza virus (AIV) prevalence in the United States. The analysis was conducted with our collaborators at USGS and UMD resulting in the publication "Spatiotemporal changes in influenza A virus prevalence among wild waterfowl inhabiting the continental United States throughout the annual cycle." <a href="https://www.nature.com/articles/s41598-022-17396-5">https://www.nature.com/articles/s41598-022-17396-5</a></p>
<p>Collaborative GeoZone Pilot Project with IZSve (Istituto Zooprofilattico Sperimentale delle Venezie)</p>	<p>Virtual</p>	<p>Americas Asia and Pasific Europe</p>	<p>CEAH staff participated in the collaborative GeoZone pilot project. Geozone was developed by IZSve (Istituto Zooprofilattico Sperimentale delle Venezie) and sets out the rules for collecting and sharing zone geospatial data. The geospatial data of a zone collected according to the GeoZone standard can be used in GIS applications for inventory, visual exploration, and spatial analysis purposes. VS CEAH staff collated information and provided use cases, data examples, details on current zone practices in the U.S. outbreaks, and other material as requested by IZSve. CEAH is one of six OIE Collaborating Centres involved in this pilot project to define geospatial data standards for zones and evaluate the potential for data system to upload and share animal disease zone data.</p>
			<p>CEAH collaborators from US Geological Service created a website, "Visualizing Avian Influenza"</p>

US Geological Service	Virtual	Americas	( <a href="https://www.pwrc.usgs.gov/ai/indexus.html">https://www.pwrc.usgs.gov/ai/indexus.html</a> ), featuring several avian influenza collaborative projects, including preliminary Risk Interface Models that model risk of avian influenza spillover from wild to domestic bird populations. These models depend on data regarding wild waterfowl distribution, influenza prevalence by waterfowl species, farm locations, and the relative risk of each farm based upon size, production method, and poultry species. The modelling output is particularly useful for poultry producers who might increase biosecurity or other preparedness activities to minimize risk of HPAI introductions.
Collaboration with Canadian Food Inspection Agency on development of a Canadian HPAI disease-spread model	Virtual	Americas	CEAH shared parameterization of U.S. National Disease Spread Model with Canada to facilitate creation of a Canadian HPAI disease-spread model. Consultation on how we modelled the current HPAI 2022 outbreak.

## TOR4 AND 5: NETWORKING AND COLLABORATION

5. Did your Collaborating Centre maintain a network with other WOAHO Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

No

## TOR6: EXPERT CONSULTANTS

6. Did your Collaborating Centre place expert consultants at the disposal of WOAHO?

Yes

NAME OF EXPERT	KIND OF CONSULTANCY	SUBJECT
Kevin Spiegel	Subject matter expert to the WOAHO Observatory	Kevin Spiegel participated in the WOAHO Observatory group tasked with analyzing the uptake of WOAHO's International Standards for Animal Health and Welfare based by WOAHO members. The Observatory is a data-driven program and a key component of WOAHO's digital transformation by increasing transparency on the WOAHO standard's uptake and therefore the progressive harmonization of rules. Meetings are held on a quarterly basis.
Jane Rooney	Subject matter expert consultation with WOAHO World Animal Health Information System	Participated in several sessions with WOAHO WAHIS staff, and their contractors, to discuss the new WAHIS reporting system and its implementation. Provided subject matter expertise on functionality of the system and proposed enhancements to improve the system.

	(WAHIS) staff	Reach out to WOAHAHIS support on a case-by-case basis when help is needed to ensure accurate reports are submitted through WAHIS.
Laura Miles	Subject matter expert consultation with WOAHAHIS World Animal Health Information System (WAHIS) staff	Participated in several sessions with WOAHAHIS staff, and their contractors, to discuss the new WAHIS reporting system and its implementation. Provided subject matter expertise on functionality of the system and proposed enhancements to improve the system. Reach out to WOAHAHIS support on a case-by-case basis when help is needed to ensure accurate reports are submitted through WAHIS.
Jim Lee	Subject matter expert consultation with WOAHAHIS World Animal Health Information System (WAHIS) staff	Participated in several sessions with WOAHAHIS staff, and their contractors, to discuss the new WAHIS reporting system and its implementation. Provided subject matter expertise on functionality of the system and proposed enhancements to improve the system. Reach out to WOAHAHIS support on a case-by-case basis when help is needed to ensure accurate reports are submitted through WAHIS.
Lori Gustafson	Subject matter expert consultation with aquaculture ad hoc meetings	Participated in species susceptibility working groups for finfish and mollusks.
Sherrilynn Wainwright	Subject matter expert liaison between WOAHAHIS, FAO	Collaboration with APHIS International Services, Inter-American Institute for Cooperation on Agriculture, Organismo Internacional Regional de Sanidad Agropecuaria (OIRSA), Centro Panamericano de Fiebre Aftosa (PANAFTOSA), WOAHAHIS, United Nations Food and Agriculture Organization (FAO), World Health Organization (WHO) and others to identify and describe emerging animal diseases.
Amy Delgado	Subject matter expert to GFTADS for the Americas and IICA	Supported bilateral, trilateral, and regional discussions around African Swine Fever control and eradication in the Americas

## TOR7: SCIENTIFIC AND TECHNICAL TRAINING

7. Did your Collaborating Centre provide advice/services to requests from Members in your main focus area?

Yes

*CEAH personnel participated in weekly meetings with Canadian Food Inspection Agency to discuss challenges, policy, surveillance, and modelling related to the ongoing highly pathogenic avian influenza outbreak.*

*DAHA (Ryan Miller) received a request from the Monitoring and Surveillance Center for Zoonotic Diseases in Wildlife and Exotic Animals and Thailand National Wildlife Health Center, Mahidol University, Thailand to participate as a subject matter expert on discussions related to methodology and tools for identifying wild boar distribution.*

*Erin Gorsich at the University of Warwick, England asked for subject matter expert input on a project looking at the movement of avian*

*influenza from Europe to North America.*

*CEAH provided review and recommendations of biosecurity practices at a slaughter facility in the Dominican Republic that slaughters both cattle and swine for potential import of beef into the United States.*

*CEAH staff liaised with the National Biosurveillance Integration Center daily to provide advice, recommendations, and consensus between the two agencies.*

*CEAH participated in cross-agency Horizon Scanning Working Group.*

8. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by WOA, to personnel from WOA Members?

Yes

a) Technical visit : 3

b) Seminars : 6

c) Hands-on training courses: 0

d) Internships (>1 month) : 5

TYPE OF TECHNICAL TRAINING PROVIDED (A, B, C OR D)	CONTENT	COUNTRY OF ORIGIN OF THE EXPERT(S) PROVIDED WITH TRAINING	NO. PARTICIPANTS FROM THE CORRESPONDING COUNTRY
a	Dr. Amy Delgado traveled multiple times to the Dominican Republic to provide epidemiologic support for the control of African Swine Fever.	Dominican Republic	15
a	Dr. Amy Delgado traveled multiple times to Haiti to provide epidemiologic support for the control of African Swine Fever.	Haiti	15
b	Dr. Oriana Beemer attended the International Symposium of Veterinary Epidemiology and Economic (ISVEE) and presented a poster summarizing the United States ASF protection zone and associated surveillance elements for Puerto Rico and the U.S. Virgin Islands. Additional information: <a href="https://venuewest.eventsair.com/isvee2022/symposium-program">https://venuewest.eventsair.com/isvee2022/symposium-program</a>	Canada, mixed international	800
b	Dr. Kathleen O'Hara and Dr. Amy Delgado attended the Global African swine fever Research Alliance (GARA) conference and presented a poster summarizing the United States' ASF protection zone and associated surveillance elements for Puerto Rico and the U.S. Virgin Islands.	Dominican Republic, mixed international	200
b	Sarah Mielke presented at the Open Session of the European Commission for the Control of Foot-and-Mouth Disease (EuFMD) Conference in October 2022 on the topic "Foot-and-Mouth Disease Virus Serotype C: What can the data tell us?". Additional information: <a href="https://www.fao.org/eufmd/meetings-and-events/os22/en/">https://www.fao.org/eufmd/meetings-and-events/os22/en/</a>	France, mixed international	1000

b	Dr. Amy Delgado presented at the Open Session of the European Commission for the Control of Foot-and-Mouth Disease (EuFMD) Conference in October 2022 on the topic "Successes and Pitfalls in Applying Model Results to Policy". Additional information: <a href="https://www.fao.org/eufmd/meetings-and-events/os22/en/">https://www.fao.org/eufmd/meetings-and-events/os22/en/</a>	France, mixed international	1000
b	Dr. Cole Vanicek presented an overview of surveillance strategies for swine hemorrhagic fevers at veterinary diagnostic labs and slaughter facilities at pre-conference session of Allen D. Lemman Swine Conference 2022. Additional information: <a href="https://lemanconference.umn.edu/program">https://lemanconference.umn.edu/program</a>	Mixed international	90
b	Drs. Christine Ellis and Katie Portacci provided training at the WOAHA Risk Assessment Training Conference including multiple lectures, roundtable materials and provided homework.	Mixed international	20
a	Dr. Amy Delgado supported the design and implementation of an indemnity program in the Dominican Republic to support the control and eradication of African Swine Fever	Dominican Republic	20
d	CEAH hosted multiple short-term and longer-term interns in 2022 while partnering with a number of programs aimed at increasing opportunities for students from historically underrepresented groups, providing hands on scientific training and professional development, and providing pathways to careers with USDA. Students were provided an opportunity to work on projects, engage with emergency response support, and learn critical skills related to surveillance design, survey design and administration, modeling, and statistical analysis.	United States	5

## TOR8: SCIENTIFIC MEETINGS

9. Did your Collaborating Centre organise or participate in the organisation of scientific meetings related to your main focus area on behalf of WOAHA?

Yes

NATIONAL/INTERNATIONAL	TITLE OF EVENT	CO-ORGANISER	DATE (MM/YY)	LOCATION	NO. PARTICIPANTS
International	WOAHA ad hoc group on species susceptibility (molluscs)	WOAHA	2022-06-01	Virtual	8

International	WOAH ad hoc group on species susceptibility (molluscs)	WOAH	2022-11-01	Virtual	9
International	WOAH ad hoc group on species susceptibility (finfish)	WOAH	2022-04-01	Virtual	9
International	WOAH ad hoc group on species susceptibility (finfish)	WOAH	2022-11-01	Virtual	9

## TOR9: DATA AND INFORMATION DISSEMINATION

10. Publication and dissemination of any information within the remit of the mandate given by WOAHA that may be useful to Members of WOAHA

a) Articles published in peer-reviewed journals:

22

Ayres, Bryan N., et al. "Rickettsial Agents Detected in Ixodid Ticks (Acari: Ixodidae) Collected from *Sus scrofa* (Artiodactyla: Suidae) in Florida and South Carolina." *Journal of Entomological Science* 57.3 (2022): 351-362.

Cook, Gericke, et al. "Surveillance Design After Initial Detection." *Tactical Sciences for Biosecurity in Animal and Plant Systems. IGI Global, 2022. 178-221.*

Ebling, Rafael, et al. "Virus viability in spiked swine bone marrow tissue during above-ground burial method and under in vitro conditions." *Transboundary and Emerging Diseases* 69.5 (2022): 2987-2995.

Hamond, Camila, et al. "Assessing rodents as carriers of pathogenic *Leptospira* species in the US Virgin Islands and their risk to animal and public health." *Scientific Reports* 12.1 (2022): 1132.

Hublin, Josephine SY, et al. "Enhanced detection of *Giardia duodenalis* mixed assemblage infections in pre-weaned dairy calves using next generation sequencing." *Veterinary Parasitology* 304 (2022): 109702.

Kramer, Corey J., et al. "Summer habitat use and movements of invasive wild pigs (*Sus scrofa*) in Canadian agro-ecosystems." *Canadian Journal of Zoology* 100.8 (2022): 494-506.

Lee, Shinyoung, et al. "Transmission of antibiotic resistance at the wildlife-livestock interface." *Communications Biology* 5.1 (2022): 585.

Malladi, Sasidhar, et al. "Predicting the time to detect moderately virulent African swine fever virus in finisher swine herds using a stochastic disease transmission model." *BMC Veterinary Research* 18.1 (2022): 1-9.

Meissner, Heike E., et al. "Risk Analysis for Human-Mediated Movement of Pests and Pathogens." *Tactical Sciences for Biosecurity in Animal and Plant Systems. IGI Global, 2022. 54-75.*

Miller, Ryan S., et al. "Adaptive risk-based targeted surveillance for foreign animal diseases at the wildlife-livestock interface." *Transboundary and Emerging Diseases* 69.5 (2022): e2329-e2340.

Moreno-Torres, Karla I., et al. "Parameterization of the durations of phases of foot-and-mouth disease in pigs." *Preventive Veterinary Medicine* 202 (2022): 105615.

Schlichting, Peter E., et al. "Seasonal variation in space use and territoriality in a large mammal (*Sus scrofa*)." *Scientific reports* 12.1 (2022): 4023.

Tabak, Michael A., et al. "CameraTrapDetector: Automatically detect, classify, and count animals in camera trap images using artificial intelligence." *bioRxiv* (2022): 2022-02.

Wilber, Mark Q., et al. "A model for leveraging animal movement to understand spatio-temporal disease dynamics." *Ecology Letters* 25.5 (2022): 1290-1304.

Ssematimba, Amos, et al. "African swine fever detection and transmission estimates using homogeneous versus heterogeneous model formulation in stochastic simulations within pig premises." (2022).

Schambow, Rachel, et al. "A qualitative assessment of alternative eradication strategies for African swine fever in the Dominican Republic." *Frontiers in Veterinary Science* 9 (2022).



Sykes, Abagael L., et al. "Estimating the effectiveness of control and eradication actions on African swine fever transmission in commercial swine populations in the United States." *bioRxiv* (2022): 2022-09.

Schambow, Rachel, et al. "Enhancing passive surveillance for African swine fever detection on US swine farms." *Frontiers in Veterinary Science* 9 (2022).

do Nascimento Schettino, Daniella. *Epidemiological Models to Inform the Design and Evaluation of Official Plans for Risk-Based Surveillance of Foreign Hemorrhagic Fevers of Swine*. Diss. University of Minnesota, 2022.

Hempstead, Stephanie C., et al. "Detection and molecular characterization of *Salmonella* species on US goat operations." *Preventive Veterinary Medicine* 208 (2022): 105766.

Spronk, T., et al. "Antimicrobial use and antimicrobial resistance monitoring for pig production in the United States of America." *Rev Sci Tech*, 41(2) preprint

Estberg, L., et al. "Business-centric data solutions for safeguarding American animal agriculture." *Rev Sci Tech*, 41(2) preprint

b) International conferences:

c) National conferences:

d) Other (Provide website address or link to appropriate information):

4

USDA. 2022. "Determining U.S. Milk Quality Using Bulk-Tank Somatic Cell Counts." USDA-APHIS-VS-CEAH-NAHMS. Fort Collins, CO. #796.0322 USDA APHIS | Determining U.S. Milk Quality Using Bulk-Tank Somatic Cell Counts

USDA. 2022. "Identification Practices on U.S. Goat Operations NAHMS Goat 2019 study" USDA-APHIS-VS-CEAH-NAHMS. Fort Collins, CO. Identification Practices of US Goat Operations Goat 2019 (usda.gov)

USDA. 2022. "Disbudding on U.S. Goat Operations." USDA-APHIS-VS-CEAH-NAHMS. Fort Collins, CO. goat2019-infobrief-disbudding.pdf (usda.gov) also available in Spanish at Resumen de Información del descornado de Cabras (usda.gov)

USDA. 2022. "Agritourism on U.S. Goat Operations" USDA-APHIS-VS-CEAH-NAHMS. Fort Collins, CO. Goat 2019 Agrotourism Brief (usda.gov)

11. What have you done in the past year to advance your area of focus, e.g. updated technology?

*Generating electronic data collection and management systems.*

*Integrating automated quality assurance and quality control into electronic data collection systems.*

*Developed publicly available dashboards supporting response efforts HPAI and ASF/Classical swine fever.*

*INFORMS National Disease Spread and control epidemiological model developed in collaboration with Texas A&M University.*

*Rapid parameterization of the National HPAI Disease Spread model of the 2022 HPAI outbreak used for preparedness, response planning, budgeting as well as serving as predictive model to help decision makers with policy decisions.*

*Framework for multi-player decision-making on the allocation of limited resources on simulated FMD outbreaks with Kansas State University.*

12. Additional comments regarding your report: