World Organisation for Animal Health

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WOAH Collaborative Centre Reports Activities 2025

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CENTRE INFORMATION

***Title of WOAH Collaborating Centre**	Collaborating Centre for Research on Emerging Avian Diseases
***Address of WOAH Collaborating Centre**	Southeast Poultry Research Laboratory, U.S. National Poultry Research Center, 934 College Station Rd. Athens, GA 30605 USA
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***Name Director of Institute (Responsible Official):**	Dr. Deana Jones, Center Director United States National Poultry Research Center
***Name (including Title and Position) of Head of the Collaborating Centre (WOAH Contact Point):**	Dr. David L Suarez, Veterinary Medical Officer
***Name of the writer:**	David Suarez

TOR 1 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 WOAH

Category	Title of activity	Scope
Disease control (true)	Characterization of highly pathogenic avian influenza from outbreaks in the United States	Highly pathogenic H5N1 avian influenza is currently endemic in wild birds and sporadic outbreaks have occurred in poultry and in dairy cattle. Because the HPAI outbreak in dairy cattle was a novel, our laboratory rapidly did work in this species to characterize the virus and recognize the importance of infection in this new species. Studies were focused on impact of the virus in milk and other dairy products and the potential for zoonotic spread. Pathogenesis experiments were also conducted on avian viruses.
Training, capacity building (true)	Technology transfer of diagnostic tests and procedures	Our laboratory has expertise in diagnostic tests and Next Generation Sequencing. We provide advanced training to transfer new technology and tests to scientific collaborators. This has included training and coordinating multi-institutional monthly meetings to develop best practices for Next Generation Sequencing. Preparation of methds for hemagglutination inhibition for bovine samples for avian influenza and enzyme-linked lectin assays (ELLA) for neuraminidase antibody testing were also developed and transferred to collaborators.
Wildlife (true)	Survellance and Characterization of avian influenza and avian paramyxovirus samples from wild birds and Vaccination of endangered wildlife	Working with partners to collect wild bird samples, we will selectively evaluate and characterize isolates of interest, particularly as it relates to poultry production. This analysis can include evaluating the sequence, replication, pathogenesis, and antigenic features of viruses. We also participated in a program to vaccinate California condors, an endangered species, for H5 highly pathogenic avian influenza. We provided consultation and diagnostic support for the programs implementation.
		Two major disease outbreaks continued into 2024, including H5N1 HPAI 2.3.4.4b in poultry and avian metapneumovirus (aMPV) subtype A and B in chickens and turkeys. The A and B subtype aMPV had not been detected in the U.S. previous to the

Avian diseases (true)	Charaterize avian influenza, Newcastle disease virus and other emerging avian viral disease pathogens in poultry	outbreak in 2024, although retrospective testing showed circulation of the virus in late 2023. Efforts to characterize the outbreak viruses, isolate different strains, conduct sequence analysis, and modify real-time RT-PCR tests for diagnosis were conducted in 2024 to respond to the outbreak. Ongoing research on HPAI virus continued to provide data to better control th outbreak. Some work continued on Newcastle disease virus, but was not a priority.
Diagnosis, biotechnology and laboratory (true)	Improved diagnostic tests for emerging poultry pathogens	Efforts to develop and improve diagnostics for improved diagnosis of outbreaks were conducted. This included updating and optimizing real-time RT-PCR diagnostics for avian metapneumovirus and compare them to commercially available diagnostics. Tests for for both aMPV were evaluated and shown to be as good or better than commercially available tests. Other real-time RT-PCR tests were tested or evaluated for highly pathogenic avian influenza to improve efficiency and speed of testing. In collaboration with University partners,, studies were performed to improve real-time RT-PCR tests to dpositivtvely detect virulent Newcastle disease virus.
Vaccines (true)	Development and efficacy of vaccines for Highly Pathogenic Avian Influenza and Newcastle Disease virus	The laboratory continues to provide testing and evaluation of both developmental vaccines and USDA licensed vaccines for safety and efficacy in poultry. Although several different types of vaccines are licensed by the USDA, they currently are not allowed for use in poultry for highly pathogenic avian influenza. Ongoing testing is needed to assure that existing vaccines are still protective and recommendations for how they might be most effectively used are provided to regulatory authorities.
Food security (true)	Safety of milk and dairy products from highly pathogenic avian influenza	With the the recogntion that highly pathogenic avian influenza can infect dairy cattle ,and that high levels of live virus can be found in milk. concerns about food safety have been raised. Studies were conducted to develop improved diagnostics tests for the detection of the virus in milk and dairy products. Testing that clearly showed that standard pasteruization methods are efffective at inactivating the virus and testing of retail dairy product samples to confirm that virus was inactivated was conducted. Additional studies on the risk of raw milk dairy products are ongoing.

TOR 3: HARMONISATION OF STANDARDS

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

Proposal title	Scope/Content	Applicable Area
OFFLU antigenic matching project	Evaluate H5 avian influenza viruses dor antigenic cartography using hemagglutination inhibition data to provide data on the better matching of virus strains.	Laboratory Expertise

3. In exercising your activities, have you identified any regulatory research needs* relevant for WOAH?

No

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

Yes

Name of WOAH CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
National Veterinary Services Laboratories, Animal and Health Plant Inspection Service, USDA	Ames, IA USA	América	Coordination or reponse to HPAI and aMPV outbreaks
Center for Epidemiology and Animal Health, Animal and Health Plant Inspection Service, USDA	Fort Collins, CO USA	América	Collaborate on HPAIV disease modeling by providing data from challenge study to better model disease

			outbreaks.
Istituto Zooprofilattico Sperimentale delle Venezie (IZSVe)	Padua, Italy	Europa	Antigenic characterization of avian influenza viruses using hemagglutination inhibition and antigenic cartgraphy. Does as part of OFFLU project.
Animal and Plant Health Agency	New Haw, Addlestone, Surrey United Kingdom	Europa	Antigenic characterization of avian influenza viruses using hemagglutination inhibition and antigenic cartgraphy. Does as part of OFFLU project.

TOR 4 AND 5: NETWORKING AND COLLABORATION

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

Yes

Name of WOAH CC/RL/other organisation(s)	Location	Region of networking Centre	Purpose
National Veterinary Services Laboratories, Animal and Plant Health Inspection Services, USDA, USA	Ames, IA	Americas	Coordination on the development or effacy of diagnostic tests for the sensitive and specific detection of emerging poultry pathogens including HPAI and aMPV subtypes A and B.

TOR 6: EXPERT CONSULTANTS

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

Yes

Name of expert	Kind of consultancy	Subject
Erica Spackman	Antigenic characterization of avian influenza virus	OFFLU collaboration project
Erica Spackman	WHO-Tool for Influenza Pandemic Risk Assessment	Participated as subject matter expert
David Suarez	On scientific committee that organized the WOAH sponsored conference "Vaccination and Surveillance for HPAI in Poultry : Current Situation and Perspectives". Paris, October 2024. The meeting was also sponsored by the International Alliance for Biological Standadization	Participated in the organization and implementation of this scientific conference on vaccination for avian influenza.

TOR 7: SCIENTIFIC AND TECHNICAL TRAINING

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

No

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

No

TOR 8: 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 WOAH?

Yes

National/International	Title of event	Co-organiser	Date	Location	No. Participants

Internationally	Vaccination and Surveillance for HPAI in Poultry : Current Situation and Perspectives	WOAH, International Alliance for Biological Standardization	2024-10-22	Paris, France	150

TOR 9: DATA AND INFORMATION DISSEMINATION

10. Publication and dissemination of any information within the remit of the mandate given by WOAH that may be useful to Members of WOAH
a) Articles published in peer-reviewed journals:
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Fasina, Y.O., Suarez, D.L., Ritter, G.D., Gerken, E.C., Farnell, Y.Z., Wolfenden, R., Hargis, B. 2024. Unraveling frontiers in poultry health (part 1) – Mitigating economically important viral and bacterial diseases in commercial chicken and turkey production. Poultry Science. 103(4). Article 103500. https://doi.org/10.1016/j.psj.2024.103500.

Gonnerman, M., Leyson, C., Sullivan, J., Pantin Jackwood, M.J., Spackman, E., Mullinax, J., Prosser, D. 2024. A systematic review of laboratory investigations into the pathogenesis of avian influenza viruses in wild avifauna of North America. Proceedings of the Royal Society. B. Biological Sciences. 291(2033):2024. https://doi.org/10.1098/rspb.2024.1845.

Suarez, D.L., Goraichuk, I.V., Killmaster, L.F., Spackman, E., Clausen, N.J., Colonius, T.J., Leonard, C.L., Metz, M.L. 2024. Testing of retail cheese, butter, ice cream and other dairy products for highly pathogenic avian influenza in the United States. Journal of Food Protection. 88(2025:e100431. https://doi.org/10.1016/j.jfp.2024.100431.

Goraichuk, I.V., Risalvato, J., Pantin Jackwood, M.J., Suarez, D.L. 2024. Improved Nanopore Influenza A whole genome sequencing protocol. Frontiers in Cellular and Infection Microbiology. Front. Cell. Infect. Microbiol. 14:1497278.. https://doi.org/10.3389/fcimb.2024.1497278.

Tewari, D., Sekhwal, M.K., Killian, M.L., Zellers, C., Nicholson, C., Schroder, B., Spackman, E., Hamberg, A. 2024. The attribution of human seasonal influenza H3N2 virus detection to the collector, not avian sources, during the 2022 highly pathogenic avian influenza outbreak in Pennsylvania, USA-implications for biosafety and biosecurity. Vector-Borne and Zoonotic Diseases. 2024(4):315-319. https://doi.org/10.3390/zoonoticdis4040027.

Chrzastek, K., Kapczynski, D.R. 2024. In silico genomic analysis of avian influenza viruses isolated from marine seal colonies. Pathogens. 13(11):1009. https://doi.org/10.3390/pathogens13111009.

Faccin, F., Caceres, J., Gay, C., Seibert, B., Bentem, N., Rodriguez, L., Fraiha, A., Cardenas, M., Geiger, G., Ortiz, L., Carnaccini, S., Kapczynski, D.R., Rajao, D., Perez, D. 2024. Mass vaccination against H9N2 avian influenza A virus with a nontransmissible, reassortment-impaired modified live attenuated influenza virus vaccine. Nature. npj Vaccines 9, 136. https://doi.org/10.1038/s41541-024-00923-y.

Mo, J., Segovia, K., Chrzastek, K., Briggs, K., Kapczynski, D.R. 2024. Morphologic characterization and cytokine response of chicken bone-marrow derived dendritic cells to infection with high and low pathogenic avian influenza virus. Frontiers in Immunology. 15:1374838. https://doi.org/10.3389/fimmu.2024.1374838.

Lee, J., Lee, C.W., Suarez, D.L., Lee, S.A., Kim, T.N., Spackman, E. 2024. Efficacy of commercial recombinant HVT vaccines against a North American clade 2.3.4.4b H5N1 Highly Pathogenic Avian Influenza Virus in chickens. PLOS ONE. 19(7):e307100. https://doi.org/10.1371/journal.pone.0307100.

Chaves, M., Hashish, A., Osemeke, O., Sato, Y., Suarez, D.L., El-Gazzar, M. 2024. Evaluation of commercial RNA extraction protocols for Avian Influenza virus using Nanopore metagenomic sequencing. Pathogens. Viruses 2024, 16, 1429. https://doi.org/10.3390/v16091429.

Spackman, E., Goraichuk, I., Jones, D.R., Colonius, T., Mccoig, A., Suarez, D.L. 2024. Characterization of highly pathogenic avian influenza virus in retail dairy products in the United States. Journal of Virology. 98(7). https://doi.org/10.1128/jvi.00881-24. Caserta, L.C., Frye, E.A., Butt, S.L., Laverack, M., Nooruzzaman, M., Covaleda, L.M., Suarez, D.L., Kapczynski, D.R., Dimitrov, K.M., Diel, D.G., Thompson, A.C., Koscielny, M.P., Cronk, B., Johnson, A., Kleinhenz, K., Edwards, E.E., Gomez, G., Hitchener, G., Martins, M., Morris, E.A., Hensley, T., Beeby, J.S., Lejeune, M., Swinford, A.K., Elvinger, F. 2024. Spillover of highly pathogenic avian influenza H5N1 virus to dairy cattle. Nature. 634:669–676. https://doi.org/10.1038/s41586-024-07849-4.

Luchansky, J.B., Porto Fett, A.C., Suarez, D.L., Spackman, E. 2024. Inactivation of avian influenza virus inoculated into ground beef patties cooked on a commercial open flame gas grill. Journal of Food Protection. 87:100325. https://doi.org/10.1016/j.jfp.2024.100325.

Spackman, E., Anderson, N., Walker, S., Suarez, D.L., Jones, D.R., Mccoig, A., Colonius, T., Roddy, T., Chaplinski, N.J. 2024. Inactivation of highly pathogenic avian influenza virus with high temperature short time continuous flow pasteurization and virus detection in bulk milk tanks. Journal of Food Protection. 87(10):2024. https://doi.org/10.1016/j.jfp.2024.100349.

Goraichuk, I., Davis, J.F., Afonso, C., Suarez, D.L. 2024. Sequencing of historic samples provide complete coding sequences of chicken calicivirus from the United States. Microbiology Resource Announcements. 0:e00777-24. https://doi.org/10.1128/mra.00777-24.

Goraichuk, I.V., Torchetti, M., Killian, M., Kapczynski, D.R., Kulkarni, A., Sary, K., Suarez, D.L. 2024. Introduction of avian metapneumovirus subtype A to the United States: molecular insights and implications. Frontiers in Microbiology. 15. https://doi.org/10.3389/fmicb.2024.1428248.

Campler, M.R., Cheng, T., Lee, C.W., Hofacre, C.L., Lossie, G., Silva, G.S., El-Gazzar, M.M., Arruda, A.G. 2024. Investigating the uses of machine learning algorithms to inform risk factor analyses: the example of avian infectious bronchitis virus (IBV) in boiler chickens. Research in Veterinary Science. 171(2024):105201. https://doi.org/10.1016/j.rvsc.2024.105201.

Lopes TSB, Nankemann J, Breedlove C, Pietruska A, Espejo R, Cuadrado C, Hauck R. Vaccines (Basel). Changes in the Transcriptome Profile in Young Chickens after Infection with LaSota Newcastle Disease Virus. 2024 May 30;12(6):592. doi: 10.3390/vaccines12060592. Log No. 414383

Mears MC, Bakre A. Characterizing Host microRNA: Virus Interactions of Orthoavulavirus javaense. Viruses. 2024 Nov 7;16(11):1748. doi: 10.3390/v16111748. Log No. 398489

Mears MC, Olivier TL, Williams-Coplin D, Espinoza E, Bakre A. Detection and differentiation of low virulence and virulent Orthoavulavirus javaense using a molecular beacon with RT-LAMP. Sci Rep. 2024 Aug 5;14(1):18047. doi: 10.1038/s41598-024-68816-7. Log No. 410385

Goraichuk, I. V., M. Harden, E. Spackman and D. L. Suarez. 2024. The 28S rRNA RT-qPCR Assay for Host Depletion Evaluation to Enhance Avian Virus Detection in Illumina and Nanopore Sequencing. Frontiers in Microbiology. Jan 31:15:1328987 DOI:10.3389/fmicb.2024.1328987. Log Number. 409956

Goraichuk IV, Torchetti M, Killian M, Kapczynski DR, Kulkarni A, Sary K, Suarez, DL. 2024. Introduction of avian metapneumovirus subtype A to the United States: molecular insights and implications. Frontiers in Microbiology. 15. 1428248. Log No. 414859

b) International conferences:
4
23rd Federation of Asian Veterinary Associations Congress. Daejeon South Korea, Oct 24-27, 2024
Vaccination and Surveillance for HPAI in Poultry : Current Situation and Perspectives. Paris France October 22-23. 2024
PROCINORTE: :North American Workshop on Priority Animal Diseases in 2024 June 11-13, 2024 Online workshop.
Annual Meeting of the International Association of Food Protection, Long Beach California, USA July 14-17, 2024.

c) National conferences:
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National Meeting on Poultry Health, Processing, and Live Production. Ocean City, MD Oct 1-2, 2024.
United States Animal Health Association Annual Meeting, Nashville, TN Oct 10-16, 2024

National Turkey Federation Annual meeting, Austin, TX, Feb 21-24, 2025

Research Alliance for Veterinary Science and Biodefense BSL-3 Network Annual meeting in Ohio, Aug 13-15 2024

American Association for Avian Pathologists Annual Meeting, St. Louis, MO July 9th-11, 2024

National Institute for Health, Centers of Excellence for Influenza Research and Response Annual meeting, New York City July 21-24, 2024

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

11. What have you done in the past year to advance your area of focus, e.g. updated technology?
Deveveloped new techniques for extracting viral RNA from milk and dairy samples for diagnostics and sequencing. Continued to make incremental improvements to next generation sequencing to improve workflow and increase sensitivity to viral pathogens. Modififed existing real-time RT-PCR tests to be compatible with routine diagnostic workflows for avian metapneumovirus, avian influenza virus, and Newcaslte disease virus. Continued to document the efficacy of licensed vaccines for highly pathogenic avian influenza virus.

12. Additional comments regarding your report:
The laboratory was tasked with responding to three major animal disease outbreaks. The ongoing highly pathogenic avian influenza outbreak in poultry continues to cause huge losses for the poultry industry. The introduction and rapid spread of avian metapneumovirus subtype A and B was an emerging outbreak that also required an emergency response to understand disease pathogenesis, improve diagnostics, and reduce losses from the outbreak. However, the outbreak of HPAI in dairy cattle resulted in the the redirection of considerable resources in the laboratory because our facility and trained staff were one of the few labs that could respond immediately to the outbreak. Food safety studies with milk and dairy products became a high priority that severely taxed the resources of the laboratory. Fewer international collaborations and cosultations could be accomadated. However, we did not turn down any requests for diagnostic support related to HPAI.