

OIE Collaborating Centres Reports Activities

Activities in 2018

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Title of collaborating centre:	Diagnosis and Vaccine Evaluation in the Americas
Address of Collaborating Centre:	National Veterinary Services Laboratories USDA, APHIS, VS, DB P.O. Box 844, 1920 Dayton Avenue Ames, Iowa 50010 UNITED STATES OF AMERICA
Tel.:	+1-515 337 73 01
Fax:	+1-515 337 73 97
E-mail address:	Randall.L.Levings@aphis.usda.gov
Website:	www.aphis.usda.gov/nvsl
Name of Director of Institute (Responsible Official):	Dr. Randall Levings, Acting Director, National Veterinary Services Laboratories, DB, VS, APHIS, USDA
Name (including Title and Position) of Head of the Collaborating Centre (formally OIE Contact Point):	Dr. Randall Levings, Acting Director, National Veterinary Services Laboratories, DB, VS, APHIS, USDA
Name of writer:	Ms. Lori Anderson, Chief of Staff, National Veterinary Services Laboratories, DB, VS APHIS, USDA

ToR: To provide services to the OIE, in particular within the region, in the designated specialty, in support of the implementation of OIE policies and, where required, seek for collaboration with OIE Reference Laboratories

ToR: To identify and maintain existing expertise, in particular within its region

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

Disease control	
Title of activity	Scope
Aujesky's Disease [Pseudorabies (PRV)] Reference Materials produced and/or provided	Diagnostic materials produced and/or provided to OIE member countries included: antiserum for multiple diagnostic tests, virus and positive control serum for VN, FA conjugate for VI, as well as proficiency tests for automated latex agglutination, gB ELISA, gI ELISA, and virus neutralization.
Anthrax and Leptospirosis Reference Materials produced and provided	<p style="text-align: center;">Anthrax:</p> <p>Diagnostic materials produced and provided to OIE member countries included: gamma phage reagent for anthrax for use in the gamma phage lysis diagnostic test.</p> <p style="text-align: center;">Leptospirosis:</p> <p>Diagnostic materials provided to OIE member countries included: reference cultures and positive and negative control sera for the MAT, multivalent fluorescent antibody conjugate, leptospira medium for MAT and FA testing, and Flazo Orange counterstain for FA testing.</p>
Bluetongue virus (BTV) Reference Materials produced and provided	Diagnostic materials produced and provided supplied to OIE member countries included: BT antisera used for ELISA/AGID diagnostic test; BT viruses 2, 10, 11, 13, and 17 and BT antibodies 2, 10, 11, 13, and 17 used for VN diagnostic tests; BT strong and weak positive antisera used in both ELISA and AGID diagnostic tests; BT fluorescent antibody conjugate; and BT proficiency panels for ELISA/AGID tests.
Contagious Equine Metritis (CEM) Reference Materials produced	Diagnostic materials produced for OIE member countries included: Modified Timoney-Shin agar, Eugon agar with 10% chocolate horse blood and culture control isolates for use in identification protocols; and CEM high positive control sera for use in CF testing.

Eastern equine encephalomyelitis (EEE), Venezuelan equine encephalomyelitis (VEE), and Western equine encephalomyelitis (WEE) Reference Materials produced and provided	No Diagnostic materials produced and/or provided to OIE member countries.
Equine Infectious Anemia (EIA) Reference Materials produced and provided	Diagnostic materials produced and/or supplied to OIE member countries included: weak positive and negative antiserum for AGID, ELISA and cELISA tests as well as serology proficiency test panels for AGID, ELISA and cELISA.
Foot and Mouth Disease (FMD) Reference Materials produced and provided	Diagnostic materials produced and/or supplied to OIE member countries included: proficiency test panels of FMD for real time rRTPCR and amplification control RNA.
Swine Influenza virus (SIV) Reference Materials provided	Diagnostic materials provided to OIE member countries included: antigen for HI tests, PCR positive control, SIV antiserum and isolates from SIV surveillance; and proficiency panels for PCR tests.
Vesicular Stomatitis (VSV) Reference Materials produced and provided	Diagnostic materials produced and/or provided to OIE member countries included: CF complement, antigen for CF test, antiserum for multiple diagnostic tests, VS viruses for VN testing, recombinant antigen for cELISA test, polyclonal ascites for cELISA tests, and proficiency panels for the VSV CF, PCR, cELISA, and VN tests.
West Nile Virus (WNV) Reference Materials produced and provided	Diagnostic materials produced and/or supplied to OIE member countries included: West Nile viral ribonucleic acid (RNA) for PCR, West Nile negative antiserum for IgM capture ELISA (horse), and West Nile equine IgM capture low positive antiserum for ELISA.
Training, capacity building	
Title of activity	Scope
Training for Methods of Proficiency Test Panel Production and Evaluation for Diagnosis of HPAI.	Provided hands-on training for methods of proficiency test panel production and evaluation in August 2018.
Training for Microscopic Agglutination Testing (MAT) and reference culture selection for leptospirosis.	Provided hands-on training for MAT and reference culture selection for Canada.
Avian diseases	
Title of activity	Scope
Highly Pathogenic Avian Influenza and Low Pathogenic Avian Influenza (Poultry) Reference Materials produced and provided	Diagnostic materials for avian influenza produced and/or supplied to OIE member countries included: Reference antigen and antisera for HI (H1-H16 tests), AGID reagents, real-time PCR positive amplification controls for matrix, H5, H7, real time PCR positive extraction control, real-time PCR negative extraction control, and real time PCR and AGID proficiency test panels.
Newcastle Disease Reference Materials produced and provided	Diagnostic materials for Newcastle Disease produced and/or supplied to OIE member countries included: real-time PCR positive amplification and extraction controls as well as positive antigen and antisera for HI tests.
Diagnosis, biotechnology and laboratory	
Title of activity	Scope

<p>Diagnostic activities for Aujeszky's Disease [Pseudorabies (PRV)]</p>	<p>Indirect diagnostic test methods: gB ELISA, gI ELISA, Autolex, VN.</p> <p>Indirect diagnostic tests performed: 1,079 Nationally, 204 Internationally.</p> <p>Direct diagnostic test methods: VI.</p> <p>Direct diagnostic tests performed: 5 Nationally, 1 Internationally.</p>
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<p>Diagnostic activities for Anthrax and Leptospirosis</p>	<p>Anthrax:</p> <p>Indirect diagnostic test methods: None.</p> <p>Direct diagnostic test method: Bacteriological culture.</p> <p>Direct diagnostic tests performed: 26 Nationally, 0 Internationally.</p> <p>Leptospirosis:</p> <p>Indirect diagnostic test methods: None.</p> <p>Direct diagnostic test method: microscopic agglutination test.</p> <p>Direct diagnostic tests performed: 2,094 Nationally, 71 Internationally.</p>
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<p>Diagnostic activities for Avian Influenza</p>	<p>Indirect diagnostic test methods: AGID, HI antibody subtype identification (H1-16), and Neuraminidase-inhibition antibody subtype identification (N1-9)</p> <p>Indirect diagnostic tests performed: 17,817 Nationally, 279 Internationally.</p> <p>Direct diagnostic test methods: Real-time PCR tests (IAV, subtyping), virus isolation, molecular pathotype (Sanger), in vivo pathotype, and whole genome sequencing</p> <p>Direct diagnostic tests performed: 8,688 Nationally, 221 Internationally.</p>
<p>Diagnostic activities for Bluetongue virus (BTV)</p>	<p>Indirect diagnostic test methods: ELISA/cELISA, AGID, and VN</p> <p>Indirect diagnostic tests performed: 404 Nationally, 75 Internationally.</p> <p>Direct diagnostic test methods: rRT-PCR, PCR, virus isolation, and sheep inoculation.</p> <p>Direct diagnostic tests performed: 434 Nationally, 310 Internationally.</p>

<p>Diagnostic activities for Contagious Equine Metritis (CEM)</p>	<p>Indirect diagnostic test method: CF.</p> <p>Indirect diagnostic tests performed: 1,096 Nationally, 346 Internationally.</p> <p>Direct diagnostic tests performed: identification of the agent, Real-time PCR.</p> <p>Direct diagnostic tests performed: 444 Nationally, 29 Internationally.</p>
<p>Diagnostic activities for Eastern equine encephalomyelitis (EEE), Venezuelan equine encephalomyelitis (VEE), and Western equine encephalomyelitis (WEE)</p>	<p>Indirect diagnostic test methods: CF, HI, IgM ELISA, plaque reduction neutralization.</p> <p>Indirect diagnostic tests performed: 3,212 Nationally, 320 Internationally.</p> <p>Direct diagnostic test methods: PCR.</p> <p>Direct diagnostic tests performed: 13 Nationally, 0 Internationally.</p>

<p>Diagnostic activities for Equine Infectious Anemia (EIA)</p>	<p>Indirect diagnostic test methods: AGID, ELISA/cELISA, and Immunoblot.</p> <p>Indirect diagnostic tests performed: 5,506 Nationally, 15,530 Internationally.</p> <p>Direct diagnostic test methods: None.</p>
<p>Diagnostic activities for Foot and Mouth Disease (FMD)</p>	<p>Indirect diagnostic test methods: ELISA (NSP, 3ABC), Virus Infection Association Antigen (VIAA) AGID Test, and Virus Neutralization.</p> <p>Indirect diagnostic tests performed: 1,378 Nationally, 0 Internationally.</p> <p>Direct diagnostic test methods: Cell Culture (IBRS-2 cells), Cell Culture (Lamb Kidney Primary Cells), Real-time RT- PCR and whole genome sequencing.</p> <p>Direct diagnostic tests performed: 8,952 Nationally, 24 Internationally.</p>

<p>Diagnostic activities for Newcastle Disease</p>	<p>Indirect diagnostic test methods: HI antibody identification (APMV-1).</p> <p>Indirect diagnostic tests performed: 1,354 Nationally, 0 Internationally.</p> <p>Direct diagnostic test methods: Real-time PCR tests (APMV-1, vNDV), APMV-1 (positive/total samples), molecular pathotype (Sanger), in vivo pathotype (ICP), and whole genome sequencing (count by isolate)</p> <p>Direct diagnostic tests performed: 6,418 Nationally, 186 Internationally.</p>
<p>Diagnostic activities for Swine Influenza virus (SIV)</p>	<p>Indirect diagnostic test methods: HI.</p> <p>Indirect diagnostic tests performed: 0</p> <p>Direct diagnostic test methods: PCR, Virus Isolation, Sequencing, and Repository Propagation.</p> <p>Direct diagnostic tests performed: 618 Nationally, 0 Internationally.</p>

<p>Diagnostic activities for Vesicular Stomatitis (VSV)</p>	<p>Indirect diagnostic test methods: cELISA (IND-1 & NJ), CF (IND-1 & NJ), and VN (IND-1 & NJ).</p> <p>Indirect diagnostic tests performed: 4,768 Nationally, 556 Internationally.</p> <p>Direct diagnostic test methods: Virus Isolation and PCR.</p> <p>Direct diagnostic tests performed: 200 Nationally, 0 Internationally.</p>
<p>Diagnostic activities for West Nile Virus (WNV)</p>	<p>Indirect diagnostic test methods: IgM ELISA, plaque reduction neutralization, and virus neutralization.</p> <p>Indirect diagnostic tests performed: 1,468 Nationally, 106 Internationally.</p> <p>Direct diagnostic test methods: RT-PCR.</p> <p>Direct diagnostic tests performed: 11 Nationally, 0 Internationally.</p>

ToR : To propose or develop methods and procedures that facilitate harmonisation of international standards and guidelines applicable to the designated specialty

2. Proposal or development of any procedure that will facilitate harmonisation of international regulations applicable to the surveillance and control of animal diseases, food safety or animal

welfare

Proposal title	Scope/Content	Applicable area
None	None	<input type="checkbox"/> Surveillance and control of animal diseases <input type="checkbox"/> Food safety <input type="checkbox"/> Animal welfare

ToR: To establish and maintain a network with other OIE Collaborating Centres designated for the same specialty, and should the need arise, with Collaborating Centres in other disciplines

ToR: To carry out and/or coordinate scientific and technical studies in collaboration with other centres, laboratories or organisations

3. Did your Collaborating Centre maintain a network with other OIE 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
Animal Health Agency, Bury, St Edmunds, Rougham Hill; Wageningen Bioveterinary Research Department of Bacteriology and Epidemiology	UK; The Netherlands	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input checked="" type="checkbox"/> Europe <input type="checkbox"/> Middle East	Currently it is difficult for any one country or laboratory to evaluate direct PCR for contagious equine metritis due to the small number of positive samples and lack of diversity of isolates when positive samples are available. By validating assays as a collaborative effort, the diversity and number of positive swabs can be expanded.

<p>National Centre for Foreign Animal Disease- Winnipeg, Manitoba, Canada</p> <p>Shanghai Veterinary Research Institute, Chinese Academy of Agricultural Sciences- Shanghai, China</p> <p>College of Veterinary Medicine, Northwest A & F University- Yangling, China</p> <p>College of Veterinary Medicine, Kansas State University-Kansas, USA</p>	<p>Canada; People's Republic of China; USA</p>	<p><input type="checkbox"/>Africa <input checked="" type="checkbox"/>Americas <input checked="" type="checkbox"/>Asia and Pacific <input type="checkbox"/>Europe <input type="checkbox"/>Middle East</p>	<p>Development of a triplex RT-PCR assay for differential detection of highly virulent Chinese strains of pseudorabies virus.</p>
<p>USDA ARS National Poultry Center Southeast Poultry Research Laboratory</p>	<p>USA</p>	<p><input type="checkbox"/>Africa <input checked="" type="checkbox"/>Americas <input type="checkbox"/>Asia and Pacific <input type="checkbox"/>Europe <input type="checkbox"/>Middle East</p>	<p>Interagency agreement for studies in poultry transmission, airborne spread, and mitigation tools for avian influenza and Newcastle disease in the USA.</p>
<p>APHIS-ARS-Uganda governments and DTRA</p>	<p>USA</p>	<p><input checked="" type="checkbox"/>Africa <input type="checkbox"/>Americas <input type="checkbox"/>Asia and Pacific <input type="checkbox"/>Europe <input type="checkbox"/>Middle East</p>	<p>Create a bank of FMD field samples to be used in validation of diagnostic tests.</p>
<p>Pirbright Institute</p>	<p>UK</p>	<p><input type="checkbox"/>Africa <input type="checkbox"/>Americas <input type="checkbox"/>Asia and Pacific <input checked="" type="checkbox"/>Europe <input type="checkbox"/>Middle East</p>	<p>Study of Senecavirus A field variance for characterization and diagnostic reagent development.</p>
<p>Izsler</p>	<p>Italy</p>	<p><input type="checkbox"/>Africa <input type="checkbox"/>Americas <input type="checkbox"/>Asia and Pacific <input checked="" type="checkbox"/>Europe <input type="checkbox"/>Middle East</p>	<p>Study of FMDV and Senecavirus A differential diagnostics for the development of monoclonal antibodies against Senecavirus A.</p>

PAHO, PANOFTOSA, OIRSA, ICA	Colombia; Panama	<input type="checkbox"/> Africa <input checked="" type="checkbox"/> Americas <input type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East	Validation of alpha virus chimeras for equine encephalitis diagnostic testing and for use without needing select agent approval.
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4. Did your Collaborating Centre maintain a network with other OIE Collaborating Centres, Reference laboratories, or organisations in other disciplines, to coordinate scientific and technical studies?

No

ToR: To place expert consultants at the disposal of the OIE.

5. Did your Collaborating Centre place expert consultants at the disposal of the OIE?

Yes

Name of expert	Kind of consultancy	Subject
Ms. Ginger Harvey	Provided consultation to the Republic of Macedonia on the requirements for validation and verification of the test methods in the OIE Chapter 2.1.1	Anthrax
Dr. Mia Torchetti	Provided consultation on HA, HI, AGID, and VI diagnostic testing for avian influenza virus to the Dominican Republic.	Highly and Low Pathogenic Avian Influenza
Dr. Mia Torchetti	Provided consultation on real time-Polymerase chain reaction diagnostic testing for avian influenza virus and Newcastle disease virus as well as reagent procurement to the Belize and El Salvador.	Highly and Low Pathogenic Avian Influenza
Dr. Consuelo Carrillo	Conducted a site visit to evaluate Patagonia North A Region for recognition as FMD-free without vaccination.	Foot and Mouth Disease
Dr. Consuelo Carrillo	Sharing of Standard Operating Procedures and forms for Panama, Dominican Republic, and Canada	Foot and Mouth Disease
Dr. Consuelo Carrillo	Sequencing of Clinical Samples for Colombia	Foot and Mouth Disease
Dr. Matt Erdman	Provided training on microscopic agglutination testing and reference culture selection for Canada	Leptospirosis
Dr. John Schiltz	Collaborated with Canada on whole genome sequencing, data analysis, and work-flow.	Swine Influenza
Dr. John Schiltz	Provided information to South Africa on options for testing animals.	Vesicular Stomatitis

Dr. John Schiltz	Provided information to Egypt on availability of proficiency tests.	Vesicular Stomatitis
Dr. John Schiltz	Provided guidance and troubleshooting to Canada related to a proficiency test problem.	Vesicular Stomatitis
Dr. John Schiltz	Provided information to Lithuania on the use of PRV controls.	Aujeszky's Disease

ToR: To provide, within the designated specialty, scientific and technical training to personnel from OIE Member Countries

6. Did your Collaborating Centre provide scientific and technical training, within the remit of the mandate given by the OIE, to personnel from OIE Member Countries?

Yes

- a) Technical visits: 2
- b) Seminars: 0
- c) Hands-on training courses: 6
- d) Internships (>1 month): 0

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	Provided consultation on whole genome sequencing methods, data analysis, and workflow for swine influenza.	Canada	1
a	Provided consultation on PCR diagnostics for (FMD)	Uganda	30
c	Provided hands-on training for methods of proficiency test panel production and evaluation for avian influenza in August 2018.	Brazil	1
c	Provided hands-on training for microscopic agglutination testing and reference culture selection for leptospirosis.	Canada	1
c	Provided Foreign Animal Disease training	USA	26
c	Provided Foreign Animal Disease training	USA	18
c	Provided Foreign Animal Disease training	USA	24
c	Provided Foreign Animal Disease training	USA	21

ToR: To organise and participate in scientific meetings and other activities on behalf of the OIE

7. Did your Collaborating Centre organise or participate in the organisation of scientific meetings on behalf of the OIE?

No

ToR: To collect, process, analyse, publish and disseminate data and information relevant to the designated specialty

8. Publication and dissemination of any information within the remit of the mandate given by the OIE that may be useful to Member Countries of the OIE

a) Articles published in peer-reviewed journals: 1

Li L, DeLiberto TJ, Killian ML, et al. Evolutionary pathway for the 2017 emergence of a novel highly pathogenic avian influenza A (H7N9) virus among domestic poultry in Tennessee, United States. *Virology*. 2018.

Lee DH, Torchetti MK, Hicks J, et al. Transmission Dynamics of Highly Pathogenic Avian Influenza Virus A (H5Nx) Clade 2.3.4.4, North America, 2014-2015. *Emerg Infect Dis*. 2018.

Li L, Bowman AS, DeLiberto TJ, et al. Genetic Evidence Supports Sporadic and Independent Introductions of Subtype H5 Low-Pathogenic Avian Influenza A Viruses from Wild Birds to Domestic Poultry in North America. *J Virol*. 2018.

Gladue, DP, Largo E, de la Arada I, Aguilera VM, Alcaraz A, Arrondo JLR, Holinka LG, Brocchi E, Ramirez-Medina E, Vuono EA, Berggren EA, Carrillo C, Nieva JL, and Borca MV. Molecular Characterization of the Viroprotein Function of Foot-and-Mouth Disease Virus on-structural Protein 2B. (2018) *J of Virology*. Nov 12;92(23).

Armson B, Mioulet V, Doel C, Madi M, Parida S, Lemire KA, Holder DJ, Das A, McIntosh MT, King DP. Detection of Foot-and-Mouth Disease Virus in Milk Samples by Real-time Reverse Transcription Polymerase Chain Reaction: Optimization and Evaluation of a High-Throughput Screening Method with Potential for Disease Surveillance. *Vet. Microbiol*. 223:189-194.

b) International conferences: 4

2018 February, Geneva, Switzerland, WHO Consultation & Information Meeting on Composition of Influenza Virus Vaccines.

2018 February, Campinas, Brazil, RESUDIA Laboratory Network Meeting.

2018 April, Brighton, United Kingdom, 10th International Symposium on Avian Influenza and OFFLU Meeting.

2018 September, Atlanta, GA, WHO Consultation & Information Meeting on Composition of Influenza Virus Vaccines.

2018 October, Borgo Egnazia, Puglia, Italy, EuFMD OS18 Increasing Global Security in the Supply of Effective FMD Vaccines.

2018 April, Santa Cruz de la Sierra, Bolivia, Comision Sudamericana para la Lucha Contra la Fiebre Aftosa (COSALFA).

2018 April, Santa Cruz de la Sierra, Bolivia, International Pre-Cosalfa Seminar 2020 on the Horizon: Challenges for the PHEFA.

c) National conferences: 2

2018 February, New York, NY, Live Bird Market Meeting.

2018 March, Minneapolis, MN, North Central Avian Diseases Conference.

2018 March, Raleigh, NC, Emergency Management Response System for Documentation and Record Management Training.

2018 March, Atlanta, GA, Low Pathogenic Avian Influenza Meeting.

2018 May, Atlanta, GA, NPIP Avian Influenza Diagnostic Workshop.

2018 June, Franklin, TN, NPIP Biennial Meeting.

2018 July, Denver, CO, American Association of Avian Pathologists Meeting.

2018 July, New York, NY, Centers for Excellence for Influenza Research and Surveillance.

2018 August, Minneapolis, MN, Live Bird Market Workshop.

2018 October, Kansas City, MO, American Association of Veterinary Laboratory Diagnosticians/United States Animal Health Association Meeting.

d) Other

(Provide website address or link to appropriate information): 3

USDA swine surveillance program acknowledgements:

- Regional patterns of genetic diversity in swine influenza A viruses in the United States from 2010 to 2016. Walia RR, Anderson TK, Vincent AL. Influenza Other Respir Viruses. 2018 Apr 6. doi: 10.1111/irv.12559. [Epub ahead of print] PMID: 29624873

- Antigenic and genetic evolution of contemporary swine H1 influenza viruses in the United States. Rajao DS, Anderson TK, Kitikoon P, Stratton J, Lewis NS, Vincent AL. Virology. 2018 May;518:45-54. doi: 10.1016/j.virol.2018.02.006. Epub 2018 Feb 16. PMID: 29453058

- Influenza A(H3N2) Variant Virus Outbreak at Three Fairs — Maryland, 2017. Duwell MM, Blythe D, Radebaugh MW, et al. MMWR Morb Mortal Wkly Rep 2018;67:1169-1173. DOI: <http://dx.doi.org/10.15585/mmwr.mm6742a1>

GenBank deposits: approximately 1750 sequences deposited in GenBank in 2018.

Website: <https://www.aphis.usda.gov/nvsl>

USDA APHIS Avian Influenza Website:

<https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/avian/avian-influenza/>

May 25, 2018 USDA Report Epidemiologic and Other Analyses of Avian Influenza Affected Poultry Flocks (H7N1 LPAI) (upload pending)

August 18, 2018, USDA Epidemiologic Analyses of Virulent Newcastle Disease in Backyard Birds in California

https://www.aphis.usda.gov/animal_health/downloads/animal_diseases/ai/vnd-epi-report-no-wild-bird-appendix.pdf

<https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/fmd/index>.

Global FMD Research Association (GFRA), Gap Analysis Workshop - INTA Buenos Aires Argentina 12 to 14 June 2018

OIE/FAO FMD Reference Laboratory Network Meeting. Pirbright, Surrey, England, 4-9 November. 2018.

USDA Website:

https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/sa_animal_disease_information/sa_equine_health/sa_west_nile_virus/ct_wnv_index/

USDA Website:

https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/horse-disease-information/equine-infectious-anemia/!ut/p/z1/04_iUIDg4tKPAFJABpSA0fpReYllmemJJZn5eYk5-

hH6kVFm8X6Gzu4GFiaGPv5BAS4GjgE-Jo7O_s7GBgHG-l76UfgVFGQHKgAlu3sfQ!!/

USDA Website:

https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/horse-disease-information/sa_encephalitis/ct_ee_index

USDA Influenza A Virus in Swine (IAV-S) Surveillance website:

https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/swine-disease-information/!ut/p/z1/IVLLboMwEPyWHnpEawMh5AgpCrRpqqZ54YvIGCdxZQwBQtp8fQmqj6UR_dizXpmV54xEFgA0ayWa1bJTDPV4Jg4dIT7A-TaeDgl7jDywl70EHYd5EYY5i1h-GT3sf-CmjPwkReMu49BEJkIW0D-p5-FTqOfTCcjF_tRz7xOj06Uh67TnyGQ8-NnEPsQj4Nn6-DB_aVtjZ3ydsIHHCe6Uq8VbBg-UaWtIW6okouC1a836KS0WxX0FXGd2WLMjYpU3QjmKo23zuJLAUrBZV6IRVpm1x7Xe6FI98Xv1o0DTTsoKqde03BW1kEoxzUVjCDn3CjQwPwmnMh9flhw_xS_C39Qv-R43uXVPWu2ZMK-l2MNUHy1R8HKcmHOZQMxdm2H0mOEsccewWQcZbmjyw3LxEpkjsmyXQ4ggT6dN6Y6q82AcHvyR4d18AARjpYs!/dz/d5/L2dBISEvZ0FBIS9nQSEh/?urile=wcm%3Apath%3A%2Faphis_content_library%2Fsa_our_focus%2Fsa_animal_health%2Fsa_animal_disease_information%2Fsa_swine_health%2Fct_swine_health_monitoring_surveillance

<https://www.aphis.usda.gov/aphis/ourfocus/animalhealth/animal-disease-information/horse-disease-information/ce m/contagious-equine-metritis>