

USAHA Committee on Cattle and Bison

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The Committee met virtually on October 19, 2020, from 12:00-2:00 p.m. EST with over 260 virtual participants. Drs. Thompson and Hairgrove welcomed the members, reviewed the Committee purpose statement, and described the meeting process including how the Committee members could participate in the virtual meeting. They determined there was a quorum of members present, for purposes of conducting committee business, including any work relevant to resolutions.

The first group of presenters for the committee meeting included the reports from the Subcommittees. The Chair requested that all subcommittee reports be held for the Consent Agenda and voted on during the Business portion of the meeting.

Reports of the following subcommittees were presented:

- Brucellosis – Janemarie Hennebelle, Georgia Department of Agriculture
- Cattle Identification – Rod Hall, Oklahoma Department of Agriculture
- Bovine Viral Diarrhea Virus (BVDV) – Shollie Falkenberg, USDA Agricultural Research Service (ARS) National Animal Disease Center (NADC)
- Trichomoniasis (Trich) – Carl Heckendorf, Colorado Department of Agriculture
- Tuberculosis – Beth Carlson, North Dakota Board of Animal Health

The Subcommittee on Tuberculosis (TB) report was given by Beth Carlson. The Subcommittee is chaired by Dr. Michael VanderKlock, and met on October 14, 2020, virtually, from 10:00 a.m. to 12:00 p.m. EST. Presentations included the TB Scientific Advisory Working Group report, an update on TB in Texas, a TB Program Update from USDA-APHIS-VS, and information presented on Human-to-Cattle M. TB complex Transmission in the United States. There were no resolutions discussed in the Subcommittee. The final report of the Subcommittee is appended to this report.

The Subcommittee on Cattle Identification report was presented by Rod Hall. Committee Chair Hall called the meeting to order at 2:30 p.m. EST. He recognized Vice Chairs Drs. Charlie Broaddus and Alicia Gorczyca-Southerland. Rules for voting and resolution submission were discussed and the subcommittee mission statement was read.

The subcommittee heard presentations from:

- Savanna Barksdale with Texas Cattle Feeders Association. She gave a summary of their two-year pilot project to study electronic identification (ID) in feeder cattle.
- Brandon Depenbush with U.S. CattleTrace. He summarized the two-year pilot phase of this project and discussed what the program looks like moving forward.
- Ken Griner with Florida Cattlemen's Association. He discussed their two-year pilot project that focused on electronic ID and collection of data in Florida livestock markets.
- Dr. Aaron Scott, USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS). He discussed APHIS' efforts in Animal Disease Traceability and their efforts to transition to electronic ID to enhance traceability.
- Rich Baca, USDA-APHIS-VS. He discussed changes to software and databases to make it more efficient and easier to collect, submit, and retrieve data for animal health officials (AHOs) and private practitioners.
- Jim Akers, Bluegrass Livestock Marketing. He compared and discussed low frequency radio frequency identification (RFID) and ultra high Frequency RFID technologies and their applications in cattle traceability.
- Dr. Andy Schwartz, Texas State Veterinarian. He summarized Texas' Ultra High Frequency RFID back tag project and how it has worked in their livestock markets.
- Dr. Mike Short, Florida State Veterinarian. He summarized Florida's Ultra High Frequency RFID back tag project and how it has worked in their livestock markets.
- Dr. Darlene Konkle, Wisconsin State Veterinarian. She gave a brief summary of their planned Ultra High Frequency RFID back tag project and the challenges they have had getting it started.

One resolution was proposed, entitled "Backup Identification of Livestock in Commerce." The resolution was discussed briefly, and minor changes were suggested. The subcommittee membership approved those changes and then voted to approve the resolution.

The meeting adjourned at 5:15 PM EST. The final report of the Subcommittee is appended to this report.

The Subcommittee on BVDV met virtually on October 13, 2020, at 10:00 a.m. EST. There were over 100 people present at the session and the topic for this year's meeting was focused on Pestivirus control as it relates to non-bovine species. Two presentations were given; 1) Dr. Chris Chase from South Dakota State University on a bovine viral disease virus (BVDV) outbreak in bison and 2) Dr. Peter Kirkland from

Elizabeth Macarthur Agriculture Institute, Australia on a Border disease virus (BDV) outbreak in a large sheep flock.

The current herd was investigated due to a decrease in calving rate and due to several bison cows observed to be thin and unthrifty. Only history of viral vaccination was in 2008. Initial testing for viral antigen was negative, so serology was conducted. All 26 animals evaluated were positive for BVDV1 with BVDV2 titers less than the BVDV1, suggesting potential BVDV1 exposure. Samples from suspect animals were collected for sequencing determine that there were PI animals in the herd. It appeared the virus was a BVDV1a based on genetic assessment. This appears to be the first bison BVDV PI and of interest is the unusual serology suggestive of a disassociation of genetic and antigen similarity.

A case study from a border disease virus (BDV) outbreak in a large flock of sheep in Australia was presented and an overview of the clinical presentation of Border disease and the prevalence was discussed. The flock was reported to have early embryonic death and abortions. Initial testing of aborted fetuses suggested no Pestivirus infection, so affected and non-affected ewes were tested and Pestivirus antibody tests were suggestive of a recent exposure of a Pestivirus. VNT test was used to initially discriminate what Pestivirus was associated with the outbreak and BDV was implicated. Visually, 15% of the lambs had hairy coats, 5% had extra hair around face and legs, and the rest appeared normal. Of the lambs with abnormal coat were tested, 68% were PI suggestive that abnormal hair coat strongly correlates with PI status. This case study highlights the value of the use of multiple diagnostic assays to better understand the causative agent involved. The final report of the Subcommittee is appended to this report.

The Subcommittee on Trichomoniasis report was presented by Carl Heckendorf. The subcommittee meeting was called to order by Chairman, Dr. Heckendorf and introductions were made.

The Subcommittee had three presenters:

- Dr. Dustin Loy, Nebraska Veterinary Diagnostic Center Bacteriology and Molecular Diagnostics, presented "Direct Detection of Trichomoniasis foetus at the Nebraska Veterinary Diagnostic Center."
- Dr. Berit Bangoura, Wyoming State Veterinary Laboratory, Department of Veterinary Sciences, University of Wyoming, presented "Trichomoniasis foetus testing in Wyoming."
- Suzanna Leckman, Quality Coordinator at Colorado Animal Health Laboratory, presented "Trich Transport in LRS and PBS".

Following the presentations, we held a panel discussion with our presenters as panelists. A panel discussion was held with the three presenters fielding questions. Initial discussion focused on the criteria for laboratories performing Trich testing. Importing states can be assured that tests performed by laboratories outside of their state are getting accurate results if testing laboratories are accredited and testing procedures are validated.

Various state Trich requirements were discussed including import requirements for female cattle and management of herds for in-state control of the disease. It was determined that having a review of state requirements and further discussing best management practices to develop information/education/outreach materials would be a good agenda theme for next year's meeting.

There were no resolutions or recommendations presented for consideration by the subcommittee. The subcommittee discussed potential topics for the next meeting agenda and adjourned at 4:20 p.m. EDT. The final report of the Subcommittee is appended to this report.

The Subcommittee on Brucellosis report was presented by Janemarie Hennebelle. The Subcommittee on Brucellosis met virtually on Tuesday, October 13, from 12:00– 2:00 p.m. EST. There were over 200 members and guests in attendance.

The three Greater Yellowstone Area (GYA) states provided updates on their surveillance area activities. There were seven new affected herds identified during FY2020: five in Wyoming (beef, bison), one in Montana (livestock), and one in Idaho (domestic elk). During the 2020 legislative session, Idaho lowered the test eligible age for DSA cattle from 18 months to 12 months and is now allowing adult brucellosis vaccination of non-Idaho origin female cattle not previously officially calf hood vaccinated. Montana continues a high rate of testing in the designated surveillance area (DSA) and expanded the boundary of the DSA in the Ruby Mountains due to the finding of two positive elk outside the DSA boundary. Based on advice from the State Veterinarian and the Game and Fish Department, the Wyoming Livestock Board repealed the Brucellosis Area of Concern in the Big Horn Mountains in the

spring of 2020. Wyoming's USDA Brucellosis Program review was postponed due to COVID-19. In-person reviews are tentatively scheduled for both Wyoming and Idaho in 2021.

Dr. Aimee Hunt provided a National Brucellosis Program Update and noted that slaughter surveillance samples are now coming from just four slaughter plants. There were 465,785 samples from those four plants between October 2019–August 2020; this is above the 350,000 samples needed to meet our detection level goal. At the time the presentation was recorded, it was still anticipated that the Proposed Domestic Brucellosis Rule (9 CFR 78) would be published this calendar year with state statuses based on disease management rather than prevalence. Subsequently, that timeline has been updated with expected publication in spring 2021.

Dr. Ryan Clarke gave three short presentations. The first presentation discussed the revised GYA testing protocol utilizing fluorescence polarization assay (FPA) plate as the primary screening test, buffered acidified plate antigen (BAPA) as the secondary screening test, and Caudal Fold (CF) as the primary supplemental test. His second presentation provided an overview of the protocol for seronegative young wild bison from Yellowstone National Park (YNP) to qualify as brucellosis-free prior to relocation among other tribes and states around the nation. Dr. Clarke's final presentation, in collaboration with Dr. Randy Capsel, was an update on the biennial review of the Select Agent List. Currently, recommendations from both USDA and CDC are for delisting *Brucella abortus*, *Brucella suis*, and *Brucella melitensis*. The advanced notice for proposed rulemaking and final rulemaking process is ongoing with expected completion in late 2021 or early 2022. In the interim, the Federal Select Agent Program (FSAP) has drafted a policy statement to address the needs for large animal brucellosis studies in outdoor containment settings. The draft policy statement was subsequently posted on October 14 (<https://www.selectagents.gov/regulations/policy/animalstudy.htm>) and will be published in the Federal Register soon for public comments.

Dr. Kelly Rhodes closed out the presentation portion of the meeting with an overview of bovine brucellosis in Mexico. Brucellosis is endemic in cattle and other ruminants in most parts of Mexico. The National Campaign against Brucellosis in Animals was established in 1996 and is highly decentralized, with a single lead agency at the national level (Development, Fisheries and Food, Mexico [SENASICA]) and implementation delegated to State-Federal-industry partnerships at the State level. SENASICA considers 15 States or zones to be in the Eradication Phase and two States to be Free (Sonora and Baja California Sur). APHIS does not currently recognize the brucellosis status of any State in Mexico, although a recent evaluation of Sonora concluded that that State has a very strong program and close to zero prevalence. This supports classifying Sonora as Level I for brucellosis in accordance with new APHIS import regulations that go into effect October 19, 2020.

The Subcommittee moved into the business meeting and held a discussion of feedback provided by subcommittee members regarding responses to Resolution #32 from 2019. No new business items were introduced for 2020. The final report of the Subcommittee is appended to this report.

Presentations and Reports

USDA-APHIS Cattle Health Program Update

Sara Ahola, USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS)

Dr. Ahola presented details of the current status of FMD vaccine funding and a National Animal Health Preparedness, Response and Emergency Planning update. There is currently up to \$15 million in the next cycle of funding; during the current funding cycle, 39 NADPRP and 26 NAHLN projects funded. Dr. Ahola shared a status update on the rule process for Brucellosis and Tuberculosis and spoke about the changes within the Strategy and Policy Unit of the Ruminant Health Center.

Malignant Catarrhal Fever Vaccine Updates

Cristina W. Cunha, USDA, Agricultural Research Service (ARS) Animal Disease Research Unit

Sheep-associated malignant catarrhal fever (SA-MCF) is a lymphoproliferative disease caused by ovine herpesvirus-2 (OvHV-2). The virus is carried asymptotically by sheep but can cause an often-fatal disease when transmitted to other animals, including cattle and bison. There is no treatment or vaccine to SA-MCF, and producers rely solely on separating susceptible and carrier animals to control OvHV-2 transmission and avoid disease outbreaks. Although separating animal species is a common practice, in certain circumstances it is difficult or even impossible to achieve. Therefore, MCF continues to be a serious problem with significant economic impact for the cattle, bison and sheep industries. It has

been clear for a long time that a vaccine is necessary to efficiently control MCF. Vaccine development is a top priority for researchers at the Animal Disease Research Unit, ARS-USDA, where we have a well-established program on SA-MCF research. In collaboration with Washington State University and University of Wyoming, our research has led to better understanding of the disease by elucidating OvHV-2 transmission, host response to infection, establishing animal models, and developing improved diagnostic methods. Together, this knowledge serves as a base for vaccine development, which has been our focus in the last few years. Substantial progress has been obtained on the identification of vaccine candidates and evaluation of delivery methods, including DNA-based and viral-vectored systems. Most importantly, vaccine trials performed in a laboratory animal model showed significant levels of protection upon exposure to OvHV-2. These promising results allow us to expand vaccine trails to more relevant animal species. Thus, our next step is to test the safety and efficacy of preeminent SA-MCF vaccine formulations in bison. The availability of a SA-MCF vaccine will greatly benefit the cattle, bison and sheep industries. Besides reducing animal losses due to MCF, having susceptible animals protected through vaccination will allow them to be in close contact with sheep without the risk of developing SA-MCF, resulting in better land use and creating opportunities for sustainable management operations.

Committee Business:

It was determined a quorum was present. Dr. Thompson asked for a motion to accept all Subcommittee reports on the Consent Agenda. A motion was made and seconded, virtually. All voice votes supported the motion, and the subcommittee reports were accepted.

Drs. Thompson and Hairgrove led a discussion of the 2019 Committee on Cattle and Bison Resolutions, and responses.

Regarding the resolution entitled "Backup Identification of Livestock in Commerce," a motion was made and seconded virtually, and passed. Dr. Thompson called for discussion. There being no discussion, a virtual voice vote was called for; the motion passed unanimously.

With no other committee business, the meeting was adjourned at 2:00 p.m. EST.

REPORT OF THE SUBCOMMITTEE ON BRUCELLOSIS

Chair: Eric Liska, MT

Vice Chair: Janemarie Hennebelle, GA

The Subcommittee met virtually on Tuesday, October 13, from 12:00-2:00 p.m. There were over 200 members and guests present. Drs. Janemarie Hennebelle and Tahnee Szymanski co-chaired the meeting.

Presentations and Reports

GYA State updates

Idaho

Bill Barton, Idaho State Department of Agriculture

Summary unavailable for these proceedings.

Montana

Martin Zaluski, Montana Department of Livestock

Montana continues a high rate of testing in the designated surveillance area (DSA) for brucellosis with nearly 80,000 tests completed in fiscal year 2020. While mandatory compliance testing remained high, voluntary testing dipped because of producers' concerns over the transition to a new testing methodology which lost specificity compared to the prior method. The new method relies on fluorescence polarization assay (FPA) initial screening and replaces the rapid automated presumptive (RAP) which had to be abandoned because the antigen needed for the RAP is no longer available.

Montana expanded the boundary of the designated surveillance area (DSA) in the Ruby Mountains due to the finding of two positive elk outside the DSA boundary in early calendar year 2020. The new addition includes approximately 10,000 additional cattle and approximately 60 producers.

An annual compliance assessment that cross references movement documentation to test records indicated a compliance of 99.6% on a per movement and change of ownership basis.

Wyoming Brucellosis update

Jim Logan, Wyoming Livestock Board

Summary unavailable for these proceedings.

USDA National Brucellosis Update

Aimee Hunt, USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), Ruminant Health Center

There were seven new affected herds between Wyoming, Montana and Idaho. All were within the current DSAs.

- National surveillance samples from the four slaughter plants that process a majority of cattle from the GYA states and supplemental surveillance within those states exceeded our threshold to meet a detection level goal of a disease prevalence of 1 in 100,000 with 95% confidence. There were 465,785 samples from the four plants enrolled in the national surveillance plan between October 2019 – August 2020, which is above the 350,000 samples needed to meet our detection level goal.
- VS conducted an abbreviated virtual review of Wyoming's brucellosis management due to COVID. No significant changes since their last review and plan to conduct a full in person review in April.
- Still anticipate the Proposed Domestic Brucellosis Rule (9 CFR 78) to be published this calendar year with state statuses based on disease management rather than prevalence.

GYA Testing Protocol

Ryan Clarke, USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), Ruminant Health Center

Loss of Rapid Automated Presumptive (RAP) test:

- Resulted in some Greater Yellowstone Area (GYA) states looking for another screening test to replace the RAP
- The FPA plate test was chosen as the new initial screening test
- Old GYA protocol = RAP > FPA + CF supplemental in series
- Initial proposed GYA protocol = FPA plate + CF supplemental in series
- Initial use of new GYA protocol quickly revealed two problems:
 - New protocol did NOT provide enough combined specificity to match the old protocol...resulting in increased false positives that needed quarantines and investigations (totally unacceptable!)
 - Local regulatory officials were unprepared to use the FPA as a screening test after years of using it as the confirmatory test (i.e. FPA screening test values were treated as if they were confirmatory test values regardless of secondary test results.)

USDA then adjusted the initial protocol by adding the BAPA in series as the confirmatory test in order to provide specificity

- Revised GYA protocol = FPA plate > BAPA + CF supplemental in series
- This change matched the combined specificity of the old protocol before the loss of the RAP test and problem was solved
- However, using the FPA as screening test still caused concern with local epidemiologists who were not used to calling samples negative after having positive FPAs!
- But protocol has now been implemented for several months and feedback from GYA states is very positive and it seems to be working well and as expected.

Initial proposed GYA protocol = FPA plate + CF supplemental

- Combined protocol Se = 97.5% and Sp = 99% (or 100 FPs per 10,000 tested)
- Revised GYA protocol = FPA plate > BAPA + CF supplemental in series
 - Combined protocol Se = 93.02% and Sp = 99.97% (or 3 FPs per 10,000 tested)
- New revised GYA protocol matches the combined Se and Sp of the National Brucellosis testing protocol and the old GYA testing protocol that included the RAP test
- Assuming a .2% DSA herd prevalence and above combined Se & Sp:
Estimated Positive and Negative Predictive Values (PPV & NPV)
 - NPV with FPA pos and BAPA neg = 99.8% (truly disease free)
 - PPV of combined FPA + and BAPA + = 89% (truly diseased)

The presentation also included a table describing test interpretation.

Bison Relocation

Ryan Clarke, USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), Ruminant Health Center

Bison Quarantine Process:

- Take seronegative young wild bison from Yellowstone National Park (YNP)
- Put them through Uniform Methods and Rules (UM & R) [2003] protocol
- Minimum of a year of testing (calving for females) in residence to qualify as brucellosis-free
- APHIS and YNP have separate but cooperating facilities in the Montana (MT) endemic area
- Graduates are transported to Fort Peck for assurance testing
- Assurance testing: Quarantine Bison are obligated to be held and tested for another year after graduation (assurance testing)
- Ft. Peck Indian Reservation has acreage and bison working facility near Poplar, MT
- Facility has been approved as an Approved Bison Assurance Testing Facility (ABATF) by APHIS and Montana Department of Livestock (MTDOL)
- As of today, APHIS and YNP have supplied 104 bison to Ft. Peck for assurance testing
- Ft. Peck is committed to distributing bison that have completed assurance testing to other Tribes (zoos, parks)
- Intertribal Buffalo Council (ITBC) is native organization of 69 Tribes in 19 states with a collective herd of over 20,000 buffalo
- ITBC is acting as a broker/advisor to Ft. Peck to facilitate the dispersal of assurance tested bison throughout the U.S.

- Recent distribution of 40 bulls to 16 tribes in 9 states
- Certified as brucellosis free by MT State Animal Health Officials (SAHO) upon graduation from Quarantine facility
- State requirements for import vary
- Importing State's level of discomfort varies
- What to label these bison is part of issue - Wildlife versus livestock versus bison

AgSAS Delisting Update

Ryan Clarke, USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), Ruminant Health Center

Randy Capsel, USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), Agriculture Select Agent Services

Biennial review process overview:

- Critical note: *Brucella* spp. are overlap select agents, and biennial review of the agents is conducted by both APHIS and CDC for recommendations
- Review of *Brucella* spp. as select agents was conducted by subject matter expert technical committees for the USDA Agriculture Select Agent Services (AgSAS) and Health and Human Services (HHS) Division of Select Agents and Toxins (DSAT)
- Recommendations from each technical committee review is supplied to the respective Director offices and is published for public comment in the Federal Register
- The DSAT and AgSAS Directors provide a set of recommendations to their respective department Secretary on what to add/remove from the list (internal process) for Final Rulemaking
- Currently, recommendations from both agencies are for delisting of *Brucella abortus*, *Brucella suis*, and *Brucella melitensis*
- The Advanced Notice for Proposed Rulemaking (ANPR) process is ongoing in preparation for publishing Final Rulemaking language
 - This Final Rulemaking process can be a long-term process and currently are projecting a 12-18-month period for finalizing the Final Rulemaking process
 - Recommendations from the ANPR process to the Final Rulemaking publication can be modified
- Pursuing conclusion of the ANPR process
 - Interagency discussions involving ANPR comments received from the Federal Register notice to pursue delisting of the three *Brucella* spp.
 - Finalizing workplan and language to be published in the Federal Register for Final Rulemaking proposal
- Reviewing a policy statement avenue to address the needs for large animal (bovine, cervid, swine) brucellosis studies in outdoor containment settings
 - All select agent regulatory requirements would remain
 - Reviewing and assessing biosafety criteria related to conducting such studies

Bovine Brucellosis in Mexico

Kelly Rhodes, USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), Regionalization Evaluation Services

Brucellosis is endemic in cattle and other ruminants in most parts of Mexico. The Federal government established the current National Campaign against Brucellosis in Animals in 1996. It is highly decentralized, with a single lead agency at the national level Development, Fisheries and Food (SENASICA) and implementation delegated to State-Federal-industry partnerships at the State level. The Campaign has three phases, or status levels: Control (prevalence > 3%), Eradication (prevalence < 3%), and Free (no cases for 3 years). Vaccination with Strain 19 or RB51 is mandatory in the Control Phase. Mexico relies primarily on serological testing for surveillance, using the Rose Bengal card test for screening. Confirmatory tests are rivanol and complement fixation, in series. Culture and isolation of *Brucella abortus* is also required to confirm infection in the Free Phase. SENASICA has authorized 269 slaughter plants nationwide to take blood samples for brucellosis testing; other surveillance streams include area testing, annual reaccreditation of free herds, annual dairy herd testing, and testing for movement between States or export. Prevalence at the national level was 0.047% in December 2019,

ranging from 0.0-7.53% between States. SENASICA considers fifteen States or zones within States to be in the Eradication Phase and 2 States to be Free (Sonora and Baja California Sur). APHIS does not currently recognize the brucellosis status of any State in Mexico, although a recent evaluation of Sonora concluded that that State has a very strong program and close to zero prevalence. This evaluation supports classifying Sonora as Level I for brucellosis in accordance with new APHIS import regulations.

Subcommittee Business:

The business meeting was called to order. A review of attendees indicated that a quorum was present for voting purposes. The first item of business was a discussion of feedback provided by subcommittee members regarding responses to 2019 Resolution #32. The responses to Resolution #32 were deemed sufficient for the current time. Additional follow-up will be needed at the Spring Government Relations Meeting for a progress report. No new business items were introduced for 2020. A motion was made to adjourn the meeting.

REPORT OF THE SUBCOMMITTEE ON BOVINE VIRAL DIARRHEA VIRUS (BVDV)

Chair: Shollie Falkenberg, IA
Vice Chair: Jamie Henningson, KS

The Subcommittee met virtually on October 13, 2020 at 10:00 a.m. EST. There were over 100 people present at the session. The topic for this year's meeting was focused on Pestivirus control as it relates to non-bovine species.

Presentations and Reports

Bovine Viral Disease Virus (BVDV) Outbreak in Bison

Chris Chase, South Dakota State University

Dr. Chase provided an overview of bovine viral diarrhea virus outbreak in a bison herd. Pestiviruses have been shown to infect various wildlife species such as white-tail deer, mule deer, antelope, and bison. The current herd was investigated due to a decrease in calving rate and due to several bison cows observed to be thin and unthrifty. Only history of viral vaccination was in 2008. Initial testing for viral antigen was negative, so serology was conducted. All 26 animals evaluated were positive for BVDV1 with titers ranging from 1:256 to 1:8192, with BVDV2 titers less than the BVDV1, suggesting potential BVDV1 exposure. Two animals were introduced to the herd and there was concern about persistently infected (PI) status of the two animals, so testing was conducted and determined that they were PI with a BVDV1a strain as determined by 5' UTR phylogenetic alignment. While genetically the isolate was most related to a BVDV type 1a, results from antigenic assessment of the bison isolate suggestive a lack of antigenic similarity to other BVDV 1a isolates. Another interesting observation was the detection of a bosavirus in these animals when conducting next generation sequencing. Histological evaluation of the animals was unremarkable for the thymus, but ileocecal valve there was underdevelopment of follicles in the PI animals. Furthermore, in the ovary, the cellular density was less and less follicles of the PI animals and in the testis, there is lack of mature spermatozoa. In summary, this appears to be the first bison BVDV PI and of interest is the unusual serology suggestive of a disassociation of genetic and antigen similarity.

Border Disease Virus (BDV) Outbreak in a Large Sheep Flock

Peter Kirkland, Elizabeth Macarthur Agriculture Institute, Australia

An overview of the clinical presentation of Border disease and the prevalence was discussed. Part of the interesting observation with this case outbreak is the lack of prevalence that is typically observed and the survivability of these lambs, as BDV is predominantly thought to be short, but in some cases, lambs have longer survivability. Viral detection methods were discussed, and while Pan-pesti methods may be reactive, the sensitivity is less, and usually a BDV specific test is necessary for confidence to ensure you are picking up all positive samples. Serology was also discussed and the cross-reactivity among pestiviruses was discussed, but in general, virus neutralization titers can be a way when run in parallel to compare serological responses and demonstrate a higher virus neutralization titer (VNT) to BDV rather than Bovine Viral Diarrhea Virus (BVDV). This is useful to indicate what pestivirus might be implicated in the outbreak rather than just looking at antigen tests. In the current case study being investigated, the flock was reported to have early embryonic death and abortions, so a variety of reproductive pathogens were explored. Initial testing of aborted fetuses suggested no pestivirus infection, so affected and non-affected ewes were tested and pestivirus antibody tests were suggestive of a recent exposure of a pestivirus. VNT test was used to initially discriminate what pestivirus was associated with the outbreak and BDV was implicated and specific polymerase chain reaction (PCR) tests for BDV were employed and intensive sampling was undertaken to better understand the role and extent of the BDV infection in this flock. Visually, 15% of the lambs had hairy coats, 5% had extra hair around face and legs, and the rest appeared normal. Of the lambs with abnormal coat were tested, 68% were PI suggestive that abnormal hair coat strongly correlates with PI status. This case study highlights the value of the use of multiple diagnostic assays to better understand the causative agent involved.

Committee Business:

Dr. Falkenberg asked if there was other business to be discussed, and without hearing any, the meeting was adjourned at approximately 11:45 a.m. EST.

REPORT OF THE SUBCOMMITTEE ON CATTLE IDENTIFICATION

Chair: Rod Hall, OK

Vice Chair: Charles Broaddus, VA

The Subcommittee met on October 13, 2020 virtually from 2:30-4:30 p.m. There were 248 members and guests present. The Purpose and Goal of the Committee were read by the Chair. Membership requirements were stated and processes for voting and resolutions were briefly discussed. The five resolutions passed in 2019 were discussed. Dr. Alicia Gorczyca-Southerland assisted with the meeting.

Presentations and Reports

Emerging Infectious Diseases (EID) Pilot Project Reports

Savanna Barksdale, Texas Cattle Feeders Association; Brandon Depenbusch, U.S. CattleTrace; Ken Griner, Florida Cattlemen's Association

Ms. Barksdale gave an update on the Texas Traceability Project that spanned from October 2018 to its conclusion in October 2020. Final summary of the project is in progress. She reported that over 100,000 head of cattle were enrolled into the project but only a total of 425 head were traced through the complete chain from ranch to packer. Preliminary findings suggest that automation of readers would have improved the number of sightings of tags and that the technology needs to be customizable for each sector of the cattle industry. They are currently retiring animals in the system and redirecting data and participants to U.S. CattleTrace.

Mr. Depenbusch provided program updates for CattleTrace which transitioned into U.S. CattleTrace (USCT) in January 2020. USCT is currently in Phase 2 and they have hired an Executive Director and Program Director. This phase over the next two years will continue to focus on developing leadership, relationships, and establishing long term funding to adhere to their mission of being an industry led voluntary animal disease traceability system.

Mr. Griner provided an update on the ongoing traceability projects in Florida that originally focused on the use of low frequency (LF) technology on cattle moving through livestock markets and has expanded to include a collaboration with a Texas producer to conduct a parallel study of LF and ultra high frequency (UHF) ear tags and the inclusion of UHF back tags at livestock markets.

Update of Proposed Emerging Infectious Diseases (EID) Transition Timeline and Update on USDA Data Management Tools

Aaron Scott, Rich Baca; USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS)

Dr. Scott discussed reduction in animal disease through a robust traceability system is an overarching USDA goal and not just a goal for APHIS. To support this goal, they have been able to provide funding to purchase RFID tag and readers, to support traceability pilot projects with partners, and to states to continue their traceability missions. Since the first of the year, over two million low frequency (LF) radio frequency identification (RFID) tags have been distributed. This includes both orange object character recognition (OCV) and white RFID tags purchased through contracts with Y-Tex, Allflex, and Datamars. They are working on contracts to be able to provide UHF RFID tags but a timeline for distribution has yet to be determined. New guidelines and standards are in place to approve new tags to ensure a variety of RFID tags are available. In July, a Federal Register Notice was posted to allow for public comments on the decision to only approve RFID tags for official identification (ID) and if so, the timeline to do so. The comment period closed on October 5th. Dr. Scott advised this process is not a vote and APHIS will address the comments in a later update. Comments received included both support and opposition for the change as well as several radical misconceptions. The comments can be viewed at www.Regulations.gov through the following Docket: APHIS-2020-0022.

Mr. Baca provided an update on the modernization of VS Information Systems. The Enterprise Message Service (EMS) is the overarching system that allows for data sharing between VS, States, and laboratories through subscription services. This data includes information from the Animal Health Events Repository, the Animal Health Services, and finally data from interstate Certificates of Veterinary Inspection. The Animal Health Services (AHS), formerly known as Mobile Information Messaging System (MIMS), will have similar activities like tuberculosis (TB) and brucellosis testing as the old platform but will be much more robust as it will now allow for the generation of interstate certificates of veterinary

inspection (iCVIs) through Veterinary Services Process Streamlining (VSPS). VSPS has been updated to adhere to the xml data schema developed by the joint USAHA/AAVLD Committee on Animal Health Surveillance and Information Systems. Goals for FY21 include adding activities for scrapie programs, swine surveillance, NVAP 1-36A generation, Coggins, and much more. Animal health surveillance (AHS) will be available as an application for iOS, Android, and Windows devices and can be used offline. Limited release to production was started on September 30 and several states are participating in pilot testing of the program. The Animal Health Events Repository (AHER) is a dashboard that incorporates VS Data Integration Services. This service is available to SAHOs and allows for users to search for animals involved in traces and query large numbers of identification numbers. The data contained in AHER is a summary of data available from source systems. Training for SAHOs was conducted this past year on how to effectively use the program.

Comparison of Capabilities, Limitations, and Strengths of LF vs UHF Technology in Cattle ID

Jim Akers, COO Bluegrass Livestock Marketing

Mr. Akers provided a summary of the pros and cons associated with low frequency (LF) and ultra high frequency (UHF) technology for cattle identification. He advised that each technology is beneficial and effective depending on the sector it is being used in. He ended his presentation with a discussion point that the industry should be focusing on dual frequency tags and not dual frequency readers to help facilitate electronic identification (ID) in the cattle industry.

UHF Back Tag Project Updates

Andy Schwartz, Texas Animal Health Commission; Mike Short, Florida Department of Agriculture and Consumer Services; Darlene Konkle, Wisconsin Department of Agriculture

Dr. Schwartz provided an update on the Texas' ultra high frequency (UHF) radio frequency identification (RFID) back tag project, which is a collaboration between Texas Animal Health Commission and the Texas Cattle Feeders Association, utilizing UHF back tags in livestock markets. They are in their final year of the pilot project and have received overwhelming positive response from the participating livestock markets as it has help improved their operation efficiency. This project is demonstrating that the utilization of UHF back tags at livestock markets and subsequent association of permanent identification device numbers with these back tags is effectively bridging the current gap in traceability to farm of origin.

Dr. Short provided a summary of Florida's UHF RFID back tag project. This project is evaluating the retention and readability of UHF back tags as well as their use at the "speed of commerce" in participating livestock markets, slaughter establishments, and at private farms and ranches.

Dr. Konkle provided an overview of Wisconsin's planned UHF RFID back tag project. A unique feature to this project will be the utilization of a dual frequency reader at a slaughter establishment. Unfortunately, COVID-19 restrictions have resulted in delays in beginning this project.

Subcommittee Business:

Resolutions were discussed as follows:

Backup Identification of Cattle in Commerce

The United States Animal Health Association (USAHA) urges the United States Department of Agriculture (USDA) and State Animal Health Officials (SAHOs) to work with livestock exporters to identify a secondary official identification option for animals being exported to account for loss of the primary official identification. The USAHA requests that the USDA initiate this collaboration between USDA, SAHOs, and livestock exporters within the first quarter of calendar year 2021 to guarantee a secondary official identification solution is available prior to and in the event of NUES tags being phased out for all purposes.

The resolution passed.

USAHA SUBCOMMITTEE ON TRICHOMONIASIS

Chair: Carl Heckendorf, CO

Vice Chair: Jim Logan, WY

The Subcommittee met on October 14, 2020 virtually, from 12:00-2:00 p.m. EST. There were 102 participants present. Dr Heckendorf welcomed participants and reminded the committee of its mission statement. He reminded meeting participants to thank our meeting sponsors and then introduced our guest speakers. Each speaker presented on *Tritrichomonas foetus* sample transport and submission protocols (summaries of each below) and then participated on a panel discussion.

Presentations and Reports

Direct Detection of *Tritrichomonas Foetus* at the Nebraska Veterinary Diagnostic Center

J. Dustin Loy, Veterinary Diagnostic Center

A new method for detection of *T. foetus* was published which utilizes parasite ribosomal ribonucleic acid/deoxyribonucleic acid (RNA/DNA) as a target using a reverse transcription real time polymerase chain reaction (PCR) approach (Summarell JVDI 2018). The authors validated this assay using a comparison with Inpouch and a commercial PCR assay, which is currently approved for use at the Nebraska Veterinary Diagnostic Center (NVDC). NVDC made minor adjustments to the published methods to integrate with our current workflows. Results indicated that this new assay (Direct RT-qPCR) with minor modifications was equivalent or superior to existing methods and demonstrated enhanced sensitivity and increased dynamic range. NVDC also evaluated direct RT-qPCR on a variety of field samples including those collected in PBS, indicating the potential for use of this assay with simplified and direct collection techniques without *T. foetus* (TF) pouches or media. The direct RT-qPCR method was initially verified using laboratory cultured *T. foetus* spiked samples of bovine smegma in phosphate-buffered saline (PBS) and included limit of detection and assay dynamic range evaluation using enumerated parasites. Additional archived samples and known positives were then tested. A field comparison in which samples were collected in parallel in both PBS and TF media, tested using our current assay and the direct RT-qPCR was also conducted in samples submitted by collaborating veterinarians. In summary, data supports the use of the Direct RT-qPCR as performance was superior to the current PCR assay in sensitivity and limit of detection and had 100% agreement in a parallel comparison on field samples.

An additional experiment was conducted to validate the recommendation made by NVDC that submitting veterinarians could collect preputial scrapings/smegma from bulls in PBS transport media, and submit to the laboratory within 72 hours while maintaining the samples under refrigeration temperature (4° C). Results following experimental parasite enumeration, inoculation and incubation in PBS/Smegma or TF/Smegma indicate that there is no significant differences in these collection media for *T. foetus* RNA stability. Lower Ct values were observed in specimens being held at 4° C vs 20° C, respectively, supporting recommendation of refrigeration. These experiments also support establishment of a Ct cutoff value for samples that have been maintained at 4° C and submitted in either TF transport media or PBS.

***Tritrichomonas Foetus* (TF) Testing in Wyoming**

Berit Bangoura, Wyoming State Veterinary Laboratory, Department of Veterinary Sciences, University of Wyoming

Currently, trichomoniasis testing is routinely performed by quantitative polymerase chain reaction (PCR) based on samples submitted in TF Transit Tubes (Biomed Diagnostics, Inc.) in the state of Wyoming. These commercially available tubes are expensive and feature a limited shelf-life. In addition, up to date there is limited data available on the relationship between *T. foetus* PCR test sensitivity and the use of TF Transit Tubes versus other media such as Modified Diamonds Medium for transport of field samples under realistic conditions. Several previous studies indicate that multiple factors such as transport temperature, bacterial sample contamination, and transport duration may influence test sensitivity for any commonly used media.

We are planning to perform a comparative study on experimentally *T. foetus* spiked preputial samples mailed from operation to diagnostic laboratory. We will evaluate the comparative sensitivity of different combinations of transport media and PCR protocols that are currently in use in different locations. The

goal is to identify which test method is most suitable to provide reliable detection of *T. foetus* under Wyoming field conditions.

Trich Transport in LRS and PBS

Suzanna Leckman, Colorado Department of Agriculture

Lactated ringers solution (LRS) and phosphate buffered saline (PBS) were tested as alternatives to BioMed TF Transit Tubes™ as transport media for *Tritrichomonas foetus* testing. Samples of various cell counts were tested in each media at 24, 48, and 72 hours after inoculation into the media. In this study, both LRS and PBS showed similar results to Biomed TF Transit Tubes™. Samples were tested with and without added smegma and the addition of smegma made *Tritrichomonas foetus* detection more difficult in all media types. At 72 hours, in all media types, low cell numbers were difficult to detect suggesting that longer transit times are not advisable. Further investigation is needed before either of these alternatives is accepted as a viable *Tritrichomonas foetus* transport media.

A panel discussion was held with the three presenters fielding questions.

Initial discussion focused on the criteria for laboratories performing *Trichomoniasis* (Trich) testing. It was concluded that most state laboratories are AAVLD Accredited and therefore must have validated procedures and are audited for proficiencies. There are differences between AAVLD Accreditation and International Organization for Standardization (ISO) Accreditation but it was suggested that ISO Accreditation should be recognized as long as testing criteria and proficiencies are validated. Importing states can be assured that tests performed by laboratories outside of their state are getting accurate results if testing laboratories are accredited.

Various state Trich requirements were discussed including import requirements for female cattle and management of herds for in-state control of the disease. It was determined that having a review of state requirements and further discussing best management practices to develop information/education/outreach materials would be a good agenda theme for next year's meeting.

Committee Business:

There were no resolutions or recommendations presented for consideration by the subcommittee. The subcommittee discussed potential topics for the next meeting agenda and adjourned at 4:20 p.m. EST.

USAHA SUBCOMMITTEE ON TUBERCULOSIS

Chair: Michael VanderKlok, MI

Vice Chair: Beth Carlson, ND

The Subcommittee met on October 14, 2020 virtually, from 10:00 a.m. to 12:00 p.m. EST. There were 174 members and guests present. Dr. Michael VanderKlok welcomed committee members and guests, introduced Dr. Beth Carlson as Vice Chair, and determined there was quorum for the committee to meet and vote on all business, including resolutions.

Presentations and Reports

USAHA TB Scientific Advisory Working Group report

Kathy Orloski provided a summary of the activities of the Scientific Advisory Working Group. The full paper is included at the end of this report.

Update on TB in Texas

Susan Rollo, Texas Animal Health Commission

Status of the TB affected herds in Parmer and Lamb Counties: Two organic dairies and a feed yard (~12,000 head) completed an assessment test in April 2015, and 15 subsequent removal tests. To date, there are 68 histocompatible samples disclosed. Currently, the dairy is pending the verification and quarantine releasing test in November. If negative, then annual assurance testing will be scheduled for five years.

Status of the TB affected dairy in Bailey County (feed yard and associated dairy in Parmer/Bailey): The dairy is released from quarantine.

Status of the TB affected dairy in Sherman County and two associated grower operations in Dallam County that are epidemiologically linked to the positive dairy:

- The ~8,700 head dairy was previously tested annually 2015- 2017 with negative test results after they received exposed heifers from a bovine TB affected dairy. The fourth test in December 2018, resulted in a high response rate. Further testing led to the identification of 68 animals with confirmed TB by culture after one assessment and three removal tests. Of the original 68, WGS revealed that 67 had a strain of last known linkage with cattle in central Mexico and one had an unusual strain which was 49 SNPs from the most recent ancestor. The fourth removal test is scheduled for October.
- One associated grower facility is a ~70,000 head calf ranch. To date, one positive heifer was disclosed on March 1, 2019. Approximately 12,000 head at the facility are considered 'exposed'. The exposed group completed a testing plan and the quarantine was released in October 2020.

The positive dairy and a second Colorado dairy under the same management utilized a heifer raising premises with ~4,500 head in Dallam County. The first whole herd test on April 8, 2019 disclosed one positive heifer. The remaining heifers at the facility returned to the affected Texas dairy and with the completion of cleaning and disinfection, this facility is closed.

Status of TB affected beef herd in Austin County: In June 2019, a positive beef herd was disclosed from a slaughter trace back. After one assessment test, an additional positive cow was identified. Whole genome sequencing (WGS) describes a unique strain to the U.S. with Mexican origin. The verification test yielded negative results and the quarantine was released this month.

- Two trace investigations are being conducted. The trace in investigation was conducted to determine the origin on TB introduction to the herd. The index cow arrived to Crystal City, Texas from North Carolina in 2013. A trace of the index cow's South Texas pen cohort (2 years duration) has been completed. This trace involved 34 animals including the pen bull. Out of state traces involved New Mexico, California, South Dakota, Mississippi and Kansas and 13 animals.
- The trace out investigation aims to disclose whether TB was transferred into additional herds. This work is ongoing, with some cases closed involving USDA indemnity. To date, TB has not been detected in those cows under enhanced slaughter surveillance. Over 90 different buyers involving > 300 animals have been identified over the 5-year trace time frame. Pass through herds where the trace animal no longer resides or cannot be positively identified result in a whole herd test of all test age eligible animals by CFT as per USDA recommendations.

Status of slaughter traced to a dairy in northeastern Panhandle: A whole herd assessment test was completed in April 2020 with no additional positive cattle disclosed. A second whole herd test is underway. To date, this dairy is not considered a TB affected dairy unless any positives are disclosed. Genetically the strain indicates a new strain to the US with historic ties to Mexico.

Status of new Sutton County beef herd investigation: In July, a slaughter trace back was identified that originated in a beef herd in Sutton County. The 12-year-old animal was a natural born addition in the herd. Further testing identified three additional positive cattle and one additional slaughter traceback. A herd plan is pending the results of the USDA CEAH model. In addition, an epidemiological investigation which includes identifying and tracing cattle sold within the previous five years is underway. The whole genome sequence describes a one SNP difference to a common ancestor of TB positives disclosed on a 2012 TB affected beef herd in Coke County.

Status of new roping steer investigation: On June 30, a slaughter trace back from a California plant was traced to a Panhandle feed yard that received roping steers from a premises in Archer County. Unfortunately, the lesion DNA did not match the official ID. A second slaughter trace back from a Wisconsin slaughter plant traced back to the same feed yard. The Mexican origin steer had DNA on the official ID that matched the lesion. The investigation revealed that a Limestone County producer imported the animal in February 2019. Whole genome sequencing on both steers revealed two different unique strains to the U.S. from Mexico. TB testing was conducted on all exposed or potentially exposed steers presently residing at the two premises. One gamma positive retired steer at the Limestone County premises did have lesions and was subsequently histocompatible and PCR positive. The WGS is pending. Both the Wisconsin slaughter trace back and the newly identified positive had 'CHS' tags (crossing papers are pending on the newest one).

Additional TB slaughter trace cases in the FY2020: One slaughter trace which was Mexican origin led to a feed yard in the Panhandle. The animal did not have an official tag and was closed as MXU (unknown) no official id.

- A second trace led to a different feed yard. This animal did have an official ID which was Mexican origin originating in Tamaulipas.
- The third trace was an animal that originated in Nebraska.

USDA APHIS VS TB Program Update

Mark Cammacho, USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) **Development of a New Proposed Brucellosis/TB Rule:** At the request of USAHA, APHIS is developing new regulations and supporting standards for the TB programs. Working groups have been set up and discussions have already been completed to craft a new version of a proposed rule. USDA is in the final stages of readying the TB rule for administrative and then public review. The goal is to include the TB rule in the Spring Regulatory Agenda. The publication of TB Proposed Rule for public comment is estimated to be late in Calendar Year 2021.

Bovine State Status: As of September 30, 2020, 49 States, two Territories (Puerto Rico and the U.S. Virgin Islands), and one zone (Michigan) were TB accredited-free. Michigan still maintains an modified accredited (MA) zone and USDA is actively negotiating a new tuberculosis (TB) memorandum of understanding (MOU) with them in 2020.

Captive Cervid State Status: All States and territories have MA status.

TB Program Reviews: The Michigan TB program was reviewed in FY 2020. A report has been written and in the process of being submitted back to the state for comment and response.

TB-Affected Herds Identified in FY 2020: There were 4 TB-affected cattle herds identified during FY 2020. Three herds were found in Michigan. Two of the Michigan affected herds were found in the modified accredited zone (MAZ) as a result of annual surveillance testing while the third herd was found in the accredited free zone by epidemiologic tracing from one of the affected herds in the MAZ. The only Texas affected herd found in FY2020 was found on a 6-35 slaughter trace from Lone Star Packing plant in Texas in July 2020. This infected slaughter animal was traced to a 600 cow ranch in Sutton County which was divided into four separate units over two counties. The index animal in this herds was a 12 year old beef cow and a natural addition (home raised, not purchased). NVSL whole genome sequencing revealed that the 2020 infection is related to a 2012 Texas affected beef herd... by only one single nucleotide polymorphism (SNP) difference from the 2012 case!

National TB Surveillance

- **Granuloma Submissions:** For FY 2020, an estimated 4,745 granulomas from 163 federally inspected establishments were submitted. Overall, 1.8 granulomas were submitted per 2,000 adult cattle (culled dairy and beef cows and bulls) slaughtered, an increase from 2019 when the granuloma submission rate was 1.55 per 2000 carcasses slaughtered.
- **Slaughter Cases:** During FY 2020, a total of 10 granuloma submissions had histology compatible with mycobacteriosis, out of 4,745 granuloma submissions (0.2 percent). Of these, TB was confirmed in nine (90 percent) cases. TB is confirmed by polymerase chain reaction (PCR) testing of formalin-fixed and direct PCR and culture of fresh tissue.
 - Of the nine confirmed TB slaughter cases, six occurred in adult cows over two years of age while three cases occurred in feeder cattle. Of the three fed cattle cases, two occurred in Mexican-origin cattle and one was in a domestic origin heifer traced to OK. Of the six adult cases, one was traced to a NE herd which was depopulated, one was traced to a large TX/OK Dairy complex which tested negative, two were traced to TX herds that tested negative, one was traced to a TX beef herd where infection was found and one traced to a TX feedlot.
- **Mexican-Origin Slaughter Cases:** A total of two TB-infected animals identified through slaughter surveillance were determined to be of Mexican-origin. The official Mexican ear tags collected at slaughter indicated origin from the State of Tamaulipas (two cases) and one case could not be traced to a MX state of origin.
- **Animal Identification Tissue Matching for Slaughter Cases:** Of the nine histocompatible cases found at slaughter, four cases had ID DNA that matched the lesion, four cases had no tissue submitted with their identification (ID) device and one ID did not match the lesioned tissue.
- **Live Animal Testing, Cattle:** Tuberculin skin testing in live animals is another component of national TB surveillance in cattle and bison. During October 1, 2019 through August 31, 2020, a total of 731,141 caudal fold tuberculin skin tests (CFT) of cattle and bison were reported, with 13,028 responders (1.8 percent, 46 states and one Territory reporting, data not available for four states).

The gamma interferon test was reinstated in June 2019 incorporating the IDVet PPD and a Prionics plate.

The following summary facts describe its performance since then:

- ~3643 total tests since June 2019 reinstatement
- 3324 tests in 2020 as of (Sept 2020)
- 118 Invalids (3.5%)
- 2612 Texas samples (78.5%)
- 2887 affected/trace herd tests (87%)
- 437 movement tests (13%)
- 18 total positives (0.5%)
- Specificity = $2/437 = 99.54\%$
- Positive Predictive Value – $10/18 = 56\%$
- PPV in Affected/Trace herds – $10/16 = 63\%$
- Found truly infected animals in five different herds in three different states
- Continue gathering data
- Compare to CCT performance
- **Live Animal Testing, Cervids:** Data available from Cervid Commodity Center.

Human-to-Cattle M. TB complex Transmission in the United States

Jason Lombard, USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS)

The *Mycobacterium tuberculosis* complex (MTBC) species includes *M. tuberculosis*, the primary cause of human tuberculosis (TB) and *M. bovis*, the primary etiologic agent of bovine tuberculosis (bTB), and other closely related *Mycobacterium*. The transmission of *M. bovis* from cattle to humans was recognized more than a century ago. Mitigations, such as pasteurization of milk and the detection and removal of lesions from cattle infected with bTB from the food chain, were put in place in the U.S. to limit human infection. These mitigations have been successful, as the prevalence of human and cattle infection with *M. bovis* has decreased significantly since the U.S. Bovine TB Eradication Program was started in 1917.

The potential of human to cattle transmission of bTB was recognized as early as 1942 when Tice reported on a herd owner with bTB in New York state that appeared to transmit *M. bovis* to four separate

herds over a 2.5-year period. Another NY dairy herd owner with bTB apparently infected his herd in the 1960's. Both owners were confirmed with bTB and had spent time in hospitals prior to their herds becoming detected as infected. These two case reports lack the laboratory data to confirm that the strains in the dairymen and the cattle were the same.

Since 2013, there have been three possible cases of human-to-cattle MTBC transmission in the U.S. The first case was a dairy herd in North Dakota where an employee with active TB disease (*M. bovis*) led to the detection of three bTB infected cattle. One of these animals was an exact match to the dairy employee. Based on the extent of infection in the human and the small lesions in the affected heifer, it was concluded that the employee likely infected the heifer. The second case involved a 4-month-old heifer calf that was born in New Mexico and transported to Texas. The calf was tested per entry requirements and found to have *M. tuberculosis*. Humans as the suspected source of *M. tuberculosis* in cattle and there are no reports of cattle-to-cattle transmission of *M. tuberculosis*. Although an infected human associated with the cattle operation wasn't found, there were matching human strains in the local area. Public health was unable to find any potential links between infected humans and the cattle. The third case also involved a Wisconsin dairy herd where an employee was detected with TB disease in 2015. The herd was tested twice with no disease detected. In 2018, a slaughter detection of bTB was traced back to the Wisconsin herd and the strains matched the past employee. Twelve infected cows have been detected to date.

These three cases provide additional evidence that human-to-cattle transmission of MTBC organisms is possible. There are multiple published reports from around the world where human-to-cattle transmission of MTBC organisms is highly suspected. Based on these findings and the fact that the source of infection for most bTB cattle herds is never determined, the potential for human introduction of bTB into cattle herds needs to be considered. A One Health approach is needed to address this issue, where industry, public health and animal health work together to evaluate and address the impact of TB-affected cattle herds on human health and the impact of human TB disease on cattle herds.

Discussion and Q&A was held on presentations.

Subcommittee Business:

Dr. VanderKlok opened the floor for receipt of recommendations or resolutions regarding tuberculosis to be considered for discussion, approval, and forwarding to the USAHA Committee on Cattle and Bison. There were no resolutions or recommendations brought from committee members.

There was no additional new business.

A motion to adjourn was made and seconded. The meeting concluded at 12:00 p.m. Eastern Time.

USAHA Bovine Tuberculosis Scientific Advisory Working Group Report

Chair: Kathy Orloski

The Working Group met virtually on Wednesday, October 7, 2020, 2:30-4:30 p.m. EST. In addition to presentations, participants discussed potential sources of bovine tuberculosis (TB) introduction into the U.S. These include Mexican imported cattle exposure to U.S. domestic cattle, TB testing stray cattle that cross into the U.S. at the U.S./Mexico border, legal and illegally imported raw milk and cheese products from Mexico, and reverse zoonosis (*M. bovis* human transmission to cattle). Dr. Rick Linscott, IDEXX, volunteered to summarize the USAHA history of resolutions and actions related to cattle imported from Mexico into the U.S., for the working group. It was also noted that this working group will look for opportunities to contribute to the TB Initiative.

In follow-up to the discussion regarding cattle imported from Mexico, USDA published the final rule, "Brucellosis and Bovine Tuberculosis: Importation of Cattle and Bison" on September 17, 2020 (<https://www.federalregister.gov/documents/2020/09/17/2020-20552/brucellosis-and-bovine-tuberculosis-importation-of-cattle-and-bison>).

Bovine TB Vaccination Project in Michigan Deer, Overview of Upcoming Study

Kurt VerCauteren, USDA, Animal and Plant Health Inspection Service (APHIS), Wildlife Services (WS), National Wildlife Research Center

Dr. VerCauteren provided an overview of upcoming research on vaccine bait delivery and bovine tuberculosis vaccine in white-tailed deer in Michigan.

World *Mycobacterium bovis* Characterization Project

Claudia Perea, USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), National Veterinary Services Laboratories (NVSL)

Strain characterization is indispensable for understanding disease epidemiology. At present, whole genome sequencing (WGS) of *Mycobacterium bovis* is giving significant insight into the evolution and spread of bovine tuberculosis (bTB) throughout the world. The resolution of WGS can provide great benefit to disease investigations and research, but the method is only as good as the database of isolates used for comparison. WGS analysis in the United States has contributed significantly to the USA official bTB eradication program by identifying sources of infection and thus increasing the success and efficiency of disease investigation when bTB is confirmed in cattle and farmed cervids. This update on the World *M. bovis* Characterization Project includes the analysis of sequences from the Dominican Republic, Costa Rica, Chile, Jalisco (Mexico) and Poland. In all, these additions provided five more major genetic groups to the NVSL database. The isolates from the Dominican Republic, Costa Rica and Jalisco closely matched isolates from humans in the United States. The acquisition of isolates from Costa Rica is part of a wider effort to obtain isolates from Central American countries (Guatemala, Honduras, El Salvador and Costa Rica) through bilateral agreements between APHIS and the animal health authorities in each country. Two agreements (Honduras and Costa Rica) have been successfully finalized, and the other two are the process of completion. Also, collaborations have been established to obtain isolates from Bulgaria, the Republic of Georgia, Brazil, Ecuador and Venezuela. Since there is no predicting where the workforce will be coming from in the future, the continued addition of sequences from other countries and resultant strain characterization is very important so that we can achieve successful source attribution and understand the introductions into the U.S.

Bovine Tuberculosis (TB) Initiative

Suelee Robbe-Austerman, USDA, Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS), National Veterinary Services Laboratories (NVSL)

Despite a highly successful TB eradication program, new introductions into our national herd are seriously straining the resources of affected states and indemnity funding. A long-term multipronged approach that focuses on surveillance, modernizing diagnostics, source attribution and biosecurity, and animal vaccination is needed. The TB initiative is a 5-year effort to identify solutions that will reduce introductions into the country, improve surveillance and better coordinate with public health to improve and protect the health of people working in the cattle industry. A major cornerstone is a Bacille Calmette-Guérin (BCG) vaccination trial that APHIS-VS

will conduct in collaboration with Secretariat of Agriculture and Rural Development (SAGARPA) in Mexico. APHIS will be initiating this project in fiscal year 2021 and plans to regularly update stakeholders on the progress of the initiative over the coming months and years.