

United States Animal Health Association (USAHA)

2020-2021 Committee Reports

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Committee on Animal Emergency Management

Swine Industry during the beginning of COVID-19

Dr. Mike Eisenmenger gave a report on the swine industry during COVID-19. He said he did not make the connection of the swine industry, panic here, lack of supplies, etc. when he saw that China's streets were empty after COVID had struck there. The swine industry is a "just in time production business" as well as a capital intense business. There is an average drop of \$400-500/day to leave a swine facility empty. In most cases, people tend to wait for the crisis to occur, then react versus plan for something like COVID-19. It is difficult to get producers and consumers to indicate what they need from each other ahead of an incident. So there was no way to predict that consumers would stop going to restaurants during COVID. The problem arose that packing plants were running at full capacity when states started to shut businesses down. What do you do if you have to de-populate so many animals? How do you stop the flow of pigs to the packing plant? To continue to back up pigs in the system, wasn't the right thing to do, so how do you dispose of the excess pigs??

Systems were built for a specific number of pigs to be processed daily, so what is the best way of handling the extra pigs? Is it right to tax the system because of the excess pigs? It then became a question as to how to humanely euthanize pigs. Welfare standards of movement, handling, euthanasia, etc. needed to be ensured and were done. COVID-19 raised these questions and may be useful if a Foreign Animal Disease (FAD) should ever enter the US. Cost was not a question when trying to dispose of the excess pigs. It was more of how to euthanize them to maintain the welfare of the animals. There was a lack of knowledge within the business about itself. Trust of government individuals, experts, and industry folks had to be done to best meet the welfare of the pigs. Lots of scientific knowledge and sharing helped deal with the large de-population of animals. The next question was how does the industry know when they have de-populated enough pigs? No one really had an idea what the number should be. You are essentially looking at what is happening today, then try to figure out what pigs couldn't be processed for an unspecified time.

Food Safety

Dr. Katie Rose McCullough gave a report of the mitigation steps taken at processing facilities that occurred after COVID interfered with the pig market. They needed to keep workers safe as well as process meat for the food supply. There was a change in production during the beginning of COVID from food service to relying on retail and panic buying (stocking up). There became an oversupply of livestock. In addition, availability of Personal Protective Equipment (PPE) also became a problem. There were extremely high levels of absenteeism seen in the slaughter plants. Non-food producing areas (break rooms, locker rooms) were of concern, as workers tended to congregate in these areas. Therefore, they needed to be regularly cleaned and disinfected. The actual food prep areas (work areas) were not the problem, as guidelines were already in place to keep them clean. Barriers and protection of employees on the production line needed to be addressed, along with ventilation of the areas. Systems were set up to keep employees six feet apart. When COVID initially entered in the United

States, the CDC stated masks were not needed. The CDC then did an about-face by mandating that masks were required. This meant the industry had to scramble to get masks for thousands of workers plus the additional PPE that was required.

Lessons learned in New York

Dr. Dave Smith reported that New York became the global epi-center for COVID-19. New York had plans in place for pandemic influenza and natural disasters. The first thing they realized was that an adequate PPE stockpile was depleted almost immediately. N95 respirators were used for poultry markets for influenza inspections and these suddenly became difficult to obtain.

They had a plan in place to adapt to working at home. What was not taken into account were the clerical workers. Not all of them had computers they could take home or computers that they could connect to their work. Many of the clerical workers had personal computers, so they were able to get IT to help them connect. It took some time to get everyone the ability to remotely work.

New York was trying to keep essential businesses open. One area they did not anticipate were pets being tested for COVID at private labs. These labs are not obligated to report positive COVID to the state. So NY worked to try to get these labs to notify the state of the positive COVIDs.

There was also a concern about animals being dropped off at shelters. Instead there was an increase in shelter adoptions.

Resolutions

There is a resolution into mass depopulation of large animals, as a result of what happened with pigs this year. The resolution passed to update and review the national veterinary stockpile resources for mass depopulation, plus have the ability to depopulate large groups of livestock.

Committee on Cattle and Bison

Bovine malignant catarrhal fever (MCF)

Sheep, bison, cattle, and rabbits are the laboratory models for MCF. Wildebeest carry the infection without any ill effects. It is when wildebeest come in contact with cattle that MCF becomes a problem. MCF is fatal in cattle. Cattle are most susceptible when wildebeest are calving. Wildebeest associated disease has been used for cell culture to create a vaccine, without much success. Attempts have been made to pass virus over and over in cell culture, but this has not been effective. Antibody did not cross react between attenuated vaccine and the disease. It has since been learned that virus neutralizing antibodies are needed to obtain immunity.

Sheep-associated MCF vaccine is being used in rabbits to see if they get the disease when exposed to the virus. Antibodies were able to block the virus; whereas, untreated animals had a high death rate. How to deliver the antibody blocking protein is the question. The development of a recombinant virus is being looked at as a possible MCF vaccine. A recombinant vaccine is where the virus is attached to a non-infectious agent.

What is the safety of this altered virus? It has been successfully used in rabbits to infect with the virus. No clinical signs were seen in the lab. This viral-vectored vaccine was infectious to rabbits, but did not cause disease. Three immunizations were given two weeks apart before challenging with a lethal dose of MCF. With the first vaccine challenge was about 71% effective in protecting against the virus. On the second challenge, effectiveness of the vaccine was 100%. In the same study, all non-vaccinated animals died.

Next year, the plan is to start some safety trials on cattle, sheep, and bison to see how effective the vaccine is. They will also be looking at new and improved diagnostic assays for MCF, as well as developing a vaccine.

White tailed deer are susceptible to MCF. They are probably an end host, so not responsible for transmission to other animals. Sheep and goats are responsible for transmission of the disease.

A question was asked if the survival after the second challenge of virus was due to vaccine or immunity. Most animals don't develop an immune response to MCF, therefore, the response is due to vaccine more than from the challenge of the virus.

Subcommittee on TB

Texas

There are two organic dairies as well as one feed yard of approximately 12,000 head that are affected with TB. All the facilities are owned by the same individuals. There is a dairy in northern Texas of about 8700 head. A huge contamination event likely caused roughly 1200 head to test positive with same strain of TB having been introduced.

TB in two different beef herds were found through slaughter trace backs. One herd was identified last summer and had a unique strain of TB from Mexico (MX). The second herd was identified this summer with approximately 585 head. This herd had a twelve year old cow that was a natural addition to the herd. It possible that she may have been a silent carrier back in 2012. There has been some commingling of exotic hoof stock as well. There is only 1 SNP (variance in strain) between these two beef herds and the 2012 positive herd.

A roping steer was identified as positive through slaughter trace back. Two animals were traced back to same herd. Three positive animals found so far. These are unique strains to the US and MX.

Lessons learned: we are unable to truly identify whether human TB plays a role in animal TB

Bovine TB Program Update

Michigan (MI) is the only state with split state status, otherwise all 50 states are considered TB free. Since 1998 the US has had 163 affected herds. Without MI, the number is 87 affected herds with 40 unique TB strains in 21 years. Nearly two new genome cases per year are somehow popping up. What is not known is: human to cattle transmission?? Are there unknown cattle movements?? Are there

established, yet undetected cases in the US?? The incidence of TB is low but has remained consistent in the US.

We are finding affected herds by area testing, if MI is removed from this method of testing. Most affected herds are found through slaughter and surveillance. One granuloma found/2000 killed (slaughter cases). Fifty to seventy cases found during 2001-2002 and these were mostly MX origin TB.

Animal ID and lesion matching through traceability of fed cattle not necessarily useful as n. Not all of these cattle are tagged, so it is sometimes difficult to identify the source of infection. Live animal testing using the CFT (caudal fold test) is widely used in TX, CA, and KS.

Interferon Gamma Testing Update

This method of testing was removed from market due to consistent problems associated with this test. The test was re-released in June 2019. We are not finding as many false positives as before being pulled from market. The specificity = $2/437 = 99.54\%$ which seen as a better percentage. We are still gathering data on this test to see how it holds up over time.

USDA still has regular meetings with SENASICA (MX), which is the equivalent to the USDA.

Bovine (zoonotic) TB initiative

Looking at what can be done to improve the TB program in the US as well as worldwide. They are taking a multi-tiered approach to improve the TB program, which includes slaughter surveillance, modernizing ante-mortem testing, building up genome banks of human and animal genomes, and cattle vaccination. There is a five year study with MX in Baja, CA working with four dairy herds.

There will be a standards based approach in the new rule. States will be classified as Consistent or Not Consistent. There will be no automatic reclassification used.

Human to Cattle Transmission

Humans become infected through raw dairy products and direct contamination with TB. It was always assumed that humans couldn't infect cattle until recently. There is highly suggestive data that this may not be so.

The TB eradication program was started in 1917 in the US. Most cases of TB are latent, so individuals may not be aware that they have the disease. Prevalence of TB is higher in foreign born, Hispanics, children (between the ages of 5-14), and women. During the 1990s the presence of TB was thought to be from MX source cattle, but this no longer appears to be the case. Currently looking at what is the source of infection of *M bovis* in infected herds in the US. It was documented in 1942 that an owner contracted *M bovis* from his herd. In 1968, another owner contracted *M bovis* from his herd, as well. During 2002-2013, due to the TB positive herds in CA, it became highly suspicious of the human to cattle infection.

Why are we now looking at human to cattle transmission?? North Dakota (ND) in 2013 had a Hispanic dairy worker that was clinically ill with the disease and sought medical attention. The Health Department in turn notified the owner of the dairy where male worked due to TB being highly

contagious from human to human. This particular dairy worker made frequent visits to MX. Due to the employee being clinically ill, he most likely spread TB to dairy herd.

Texas in 2018, a calf was transported from NM at 1 day of age and later found positive for TB. A dairy worker had symptoms and signs of TB, but no longer worked at the dairy.

Wisconsin had an infected dairy worker, with clinical signs, who was employed from January to March of 2015. He was a Hispanic worker. In 2018 a TB positive lesion was found in the herd. The SNP of the employee was very close to strain found in the cows. There was the same SNP change in all the cows. This alludes to the human to cattle spread of TB when clinical disease is noted in humans.

Worldwide, other countries have reported human to cattle transmission. Africa and India have higher human TB infections than other places globally. There is the full circle of transmission: that of human to cattle and from cattle to human. It is more likely that humans are exposed through improperly cooked meat and then expose cattle to the disease. Respiratory and sputum are the likely cause of spread to cattle. In addition, discharging chewed tobacco directly into the mouth of a cow is a practice in some countries. Another source of TB infection from humans to cattle is the practice of urinating on the hay that will be consumed by cattle. Humans are most likely to get TB, followed by dogs, elephants, parrots, non-human primates, and cattle.

US cattle herds continue to become infected with TB and the source is unknown in more than 50% of the cases found. A one health approach is needed to address the issue of human to cattle spread.

A question was raised during the meeting as to whether anyone is doing employee screening programs. The answer came back as not specifically. There is one dairy in WI which is focused on employee health. ND encourages routine testing of employees. Unfortunately, not all health departments seem to be as forward thinking as WI and ND for testing. Someone stated that one CA dairy has instituted a screening program with their employees. So as of yet, there are no statewide programs to encourage testing of employees at dairies.

Another question raised: Has this information been shared with veterinary public health? The USDA hasn't received approval to engage these individuals with TB human to cattle transmission. It is recommended that there be screening of high risk foreign borne individuals.

Michigan said that when TB has been identified in a herd, public health is notified so that employees can be screened for exposure.

ND doesn't routinely test cattle because they are unable to ship due to the distance and possible exposure to individuals along the route. TB testing is done either on farm or has been done at the state lab. They euthanize via bullet to limit exposure versus hauling to a distant slaughter plant.

Subcommittee on Cattle Identification

Texas Traceability Pilot

The study was conducted from October 2018 – October 2020. The focus was on disease traceability. Technology neutral involved the use of dangle tags and EID (electronic ID) tags. A total of 100,000 head were enrolled and involved seven different states. Tag number, date, physical location, point of contact,

group/lot number was the minimum data collected. A total of 425 head were followed from beginning to end. Ranchers were allowed to notify when cattle moved and would be tagged. Some cattle were already processed before information was received to follow them through. It was easier to follow cattle from the feedyard to the packer. Most of the sightings were from the feedyard. Auction markets had 1500 plus sightings, while ranches had 28,000 plus sightings. It was determined that the one-size-fits-all approach will not work for traceability. Each setup needs to have their own system to track animals. Feedyards involved in this study were voluntary. It is an automated system, it keeps confidentiality, and a voluntary national system is indicated for traceability. This study only used EID tags - no requirement on the tag, just had to be an EID.

US CattleTrace

The Phase Two Stand Up phase from October? 2020-October 2022. Data collection and management - is the reader working at that particular facility?? Globally accepted voluntary animal disease traceability system for cattle is the goal.

What is the role of US CattleTrace? To fill the gap on the feeder cattle segment. Serves as a national system for identification for disease traceability. What is the estimate of funding and sustaining the program? Funding should come from all production segments, not just the producer, since it benefits everyone.

Florida Traceability Taskforce

Florida realized that cattle ID is needed. It has to be electronic, it needs to be all cattle as they enter commerce, and we need to pursue voluntary and may ultimately make it mandatory. Disease may force us to have a mandatory system in place.

In 2018, a taskforce in Florida focused on livestock markets and low frequency ID tags. The early phase of the taskforce found that traceability does work in FL. Ninety-nine percent on 1600 animals were read through the market. Cattle should be tagged prior to arrival at the market. They will be looking at UHF (ultra high frequency) back tags and also looking at LF (low frequency) tags on the same animal for testing both retention and readability.

Kansas, Texas, and Florida are three states looking heavily into traceability. Florida doesn't have the volume of cattle as the Midwest, but they are considered a cow-calf state. Where does the data go? It is recorded on tablet or phone then manually transferred.

Reduce animal disease

More than two million tags distributed since January 2020. Most are LF tags due to market setups and done in replacement heifers only. Transition to RFID by January 1, 2023??

VS Information Systems Update

Looked at the capabilities and limitations of LF versus UHF tags. Both 840 (US symbol) and non-840 versions available. Both ISO (international) and USDA Standards read rates similar in the field 95-99%.

The current cost of tags is similar. They operate at different read range LF=12-18", UHF=10-20'. They also respond differently to environmental influences. Cost of the reader equipment is different (UHF is cheaper).

Low frequency tag size is small and round. It is widely accepted and effective where animals are being handled single file (packing plants, chutes, etc.) The cons: short read range of 12-18", requires animals to be funneled through narrow openings, panel reader installations very sensitive to metal, electric motors, and certain lights in or around the read field.

Ultra high frequency tags have a long read range of 25-30', ISO standard and USDA interim tag standard, and can be tuned down to accommodate reading individual animal without picking up the entire herd. The cons: panel type tag to accommodate a larger antennae, not a mature technology in the livestock space (but increasing acceptance), lacks finalized standard, and ICAR (the global standard for livestock data) recognition, and the line of sight read - report of mud/manure reducing ability to read.

Each technology works better for different sectors of the production cycle. The ultimate solution is a dual frequency tag? Dual frequency reader technology is not really the solution. You give up the advantages of UHF for those that need it.

Texas UHF Back Tag Project

To document capability of UHF back tags with official identification devices. The objective is to collect animal movement and disease program data without interfering with daily operations. Collecting information at livestock markets, order buyer/dealers, feedyards, and non-federal packing plants. UHF back tags have been delivered to 359,000 head. UHF back tag read rates of 98-99% or better on entering the sale ring. Tags should be put near the shoulder, but end up anywhere on the animal. Texas markets are becoming more interested in using UHF and they are willing to install the equipment and software if APHIS provides the tags at no cost.

Florida UHF Back Tag Project

Direct farm/ranch to slaughter transactions were to be performed with 40,000 tags for the project. It has been delayed due to COVID -19 outbreak this year.

Wisconsin UHF Back Tag Project

Delays due to COVID and technology occurred. They are working with a large slaughter plant which has a dual reader but hasn't been installed yet.

Why use UHF back tag versus LF tag?? Only one company is making them presently. The advantages with UHF tags are you don't have to catch each individual animal. UHF tags last on the animal about the same as regular back tags, they are about \$0.20 each and require less personnel to put them on. Another advantage is that packers don't like the bruising associated with running them through a chute. Back tags are for animals going to slaughter within 72 hours, but that doesn't always happen.

Resolution

Should an official identification be lost, what second identification should be used? Resolution passed to find what second official ID should be used.

Brucellosis Subcommittee

Montana

There were two positive Brucellosis tests out of 100 elk tested in the Ruby Mountains. A boundary change was made and now includes 441 herds. Approximately, 116,000 cattle and domestic bison are included in this area. A herd in Madison County performed a voluntary Brucellosis check and was found to be positive in December 2019. Producer compliance has been greater than 97%. Testing, movement, and change of ownership compliance was better than 99%. Overall, compliance for Brucellosis testing in fiscal year 2019 was good.

Wyoming

Wyoming has had no brucellosis infected dairies since 1998 and no infected herds outside the GYA (Greater Yellowstone Area) since 2011. All 50 states are considered Brucellosis free at this time.

In 2020, five new herds in the DSA (designated surveillance area) were found, three beef and two bison. Three cattle herds were identified last fall. Genomic studies indicate the exposure of these herds is through elk. Only one animal found positive in each cattle herd. The positives were found through routine testing. The beef herds had their quarantines lifted earlier this summer. One bison herd will undergo annual testing and the second bison herd will begin whole herd testing in October 2020. The two affected bison herds are not epidemiologically linked.

The first bison herd was east of Yellowstone and south of Montana. The heifer was seropositive and it was noted that she never had a calf. The second herd had a sick bull for a number of months and was isolated for well over a year before brucellosis was isolated from this animal. This animal was found in September 2020. There was one other bull found positive in the herd.

Idaho

One new captive elk herd positive for brucellosis in Idaho. First whole herd test found three reactor cows, one suspect cow, and five reactor bulls. This herd was likely exposed from a wild elk cow.

Swine brucellosis will be included in new proposed rule

FPA plate test

FPA (fluorescence polarization assay) is the new screening test. It is a much more sensitive test, but has a lot more false positives, which required more quarantine and investigation. FPA had been used to confirm positive screening tests. BAPA brought in as a 2nd screening test for the new GYA protocol.

There are still higher FPA values, which create some concern. The revised protocol uses FPA plate as primary screening, secondary is BAPA + CF (Sensitivity = 93.02%, Specificity = 99.97%). This means three false positives for every 10,000 animals tested, which made testing more accurate.

There are a high number of tests being run in a short period of time, so cost, time involved, number of tests, and seasonality of testing must be considered. FPA plate versus tube test can have different results, so looking into these two tests. Possibly has to do with the difference in dilution of the solutions.

Bison movement/quarantine

To move bison, they are taking sero-negative young wild bison from Yellowstone National Park (YNP). There is a minimum of one year of testing in a quarantine facility, just north of YNP. Once the bison graduates from this quarantine, they are moved to Fort Peck, MT. Assurance testing is required, which involves an additional year of testing. To date there have been 104 bison approved to move to Fort Peck for the assurance testing. Some animals have passed the assurance testing and have been distributed to other states. Zoos, parks, and other Tribes (involving 19 states) have received these animals. Each state has different requirements: wildlife vs livestock vs bison.

Select Agent Update

USAHA is trying to remove brucellosis from the Select Agent List. A biannual review process is performed. HHS Division of Select Agents and Toxins is also involved. We are asking for the de-listing of *B abortus*, *B suis*, and *B melitensis* so that further research can be done on these diseases. To have large enough samples of large animals, we are looking at open pen studies which has been the main concern for taking the disease off of the Select Agent List.

Mexico Brucellosis Program

Brucellosis is endemic in cattle in Mexico. Strain 19 has been available since 1942 and was voluntary in Mexico, so it was not an effective program. In 1971, the National Brucellosis Campaign was started, with state government's role as the enforcer. The state testing requirements can't over rule the federal program. The Rose Bengal plate test is the main test used.

The SAGARPA website lists 8113 brucellosis free herds which is about 0.025% of the population. USDA doesn't recognize any part of Mexico as free, even though Mexico has some areas marked as free. A classification system must be based on minimum program standards and prevalence for USDA to recognize an area. Senora, Mexico will likely be classified as level one after further review.

Brucellosis removal from Select Agent List

USDA and Human and Health Services (HHS) are the federal government leads in favor of de-listing of brucellosis as a select agent. The Department of Homeland Security (DHS) is still considering the de-listing. The committee's recommendation is that this is sufficient for the current time, but we need to follow-up.

