

## REPORT OF THE COMMITTEE ON BRUCELLOSIS

Chair: Glenn E. Plumb, Yellowstone Park, WY

Vice Chair: Claude E. Barton, Nashville, TN

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The Committee met on October 27, 2008 at the Sheraton Greensboro Hotel, Greensboro, North Carolina, from 1:00 to 6:15 p.m. There were 48 members and 59 guests present. Thirty-two of the guests requested to become members of the Committee. The meeting was chaired by Dr. Glenn Plumb, National Park Service. There were ten scientific presentations and reports. Two resolutions were presented to the Committee for consideration. Dr. Claude Barton, gave a brief review of the 2007 Annual Meeting reported on six resolutions from that meeting. The response from United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) to all was positive.

The Committee received report from the Scientific Advisory Subcommittee on Brucellosis from Dr. Philip Elzer, Chair. The report was accepted and is included in this Committee Report.

The Committee received a report from the Feral Swine Subcommittee on Brucellosis and Psuedorabies chaired Dr. Carter Black. The report was accepted and is included in this Committee Report.

Dr. Marty Zaluski, Montana, provided a report on the Subcommittee on Brucellosis in the Greater Yellowstone Area. The report was accepted and is included in this Committee Report.

Dr. Brian McCluskey, VS-APHIS-USDA, presented a time-specific paper titled National Brucellosis Elimination Zone Proposal. The paper is included in these proceedings following the Committee Report.

Drs. Debbi Donch and Arnold Gertonson, VS-APHIS-USDA, presented the Status Report – Fiscal Year 2008, Cooperative State-Federal Brucellosis Eradication Program. The full text of this presentation is included at the end of this report.

Dr. Alfredo Gutierrez, Mexico presented a report entitled Status of the Campaign against Brucellosis in Mexico. The full text of this report is included at the end of the Committee Report.

## Report of the Scientific Advisory Subcommittee on Brucellosis

Philip Elzer, Chair

Subcommittee Chair Phillip Elzer, Louisiana Annual State University (LSU), convened the Subcommittee at 12:00 p.m., October 25, 2008 during the 112<sup>th</sup> Meeting of the United States Animal Health Association (USAHA). Subcommittee members are Don Davis, Phillip Elzer, Don Evans, Barb Martin, Steve Olsen, Jack Rhyhan, and Gerhardt Schurig. There was one scientific issues referred to the Subcommittee during the year. Members present were Davis, Elzer, Rhyhan and Olsen. There were 24 visitors also in attendance.

John Korslund, Veterinary Services (VS), gave a presentation entitled Proposed Standardized Serology Protocol for Swine Brucellosis Surveillance and Case Diagnosis. The main discussion points were the testing of serum and tissues for *Brucella suis* in the context of a swine brucellosis surveillance plan. There were numerous questions regarding serology and which test should be used for surveillance knowing the limitations of reagents, standardized tests and testing, validation of tests and test accuracy. The Committee will help facilitate data mining to see if fluorescent polarization assay (FPA) has been tested on a panel of swine samples. It was also suggested that Dr. Klaus Neilson, one of the developers of the FPA, be contacted for some data and new enzyme linked immuno sorbent assay (ELISA) technologies be explored.

John Treanor, Yellowstone National Park, gave a presentation entitled Effectiveness of RB51 Vaccination for Yellowstone Bison. The main discussion points offered responses to six focal questions, recognizing that sufficient data is generally lacking to make specific recommendations.

1. What level of vaccine efficacy can be expected in Yellowstone bison compared to experimental studies? It was discussed that the protective effects of a vaccine under field conditions may be influenced by a number of factors including, but not limited to, nutrition, environmental stress, percentage of the population vaccinated, and co-infection with other pathogenic agents. It was discussed that if all parameters are the same, protection under field conditions is most likely to be similar to protection under experimental conditions. However, it was also discussed that efficacy under field conditions may be greater as all animals are not exposed with an infectious dosage at the most susceptible time. At the present time, experimental data for hand vaccination of bison with RB51 suggests a 50-60 percent reduction in abortions, 45-55 percent reduction in infection of uterine or mammary tissues, and a 10-15 percent reduction in infection when animals are necropsied at parturition in a standard mid-gestational challenge model. Committee members are reluctant to specifically predict field efficacy of current vaccines due to the multiple factors that may influence protection as mentioned above, and suggest that scientific studies be initiated if specific measurements of protection are needed.
2. Can similar vaccine efficacy be expected from remote delivery compared to syringe delivery? In general, Committee members discussed the fact that currently available data suggests that remote delivery induces protection that is less than hand vaccination. The scientific basis for this reduction has not been specifically identified but multiple factors were discussed that may be influencing the current observations. For reasons similar to those discussed above for vaccine efficacy, the Committee cannot place a specific numeric value on the reduction.
3. Is it safe to vaccinate pregnant bison prior to mid-gestation? Although scientific data is limited, the committee felt that when compared to the risk associated with the possibility of infection and abortion caused by field strains of *Brucella abortus*, risks associated with administration of vaccines strains to Yellowstone bison are not significant. The Committee discussed the fact that abortions have been documented in bison with RB51 and Strain 19. It was discussed that unknown factors may influence the incidence of abortions by brucellosis vaccine strains. Two Committee members discussed studies in which they were unable to induce abortions in pregnant bison with RB51 in safety studies involving single or multiple dosages. The Committee is currently unable to provide specific numeric estimates for abortions in pregnant bison induced by brucellosis vaccines.
4. What is the best time of year to maximize vaccine efficacy? The Committee discussed that, with the exception for the influence of nutritional or environmental stress, it was anticipated that responses to calfhood vaccination would be similar. It was also discussed that pregnant bison may

be less responsive to vaccination particularly around the peripartuient period. The Committee recommends that vaccination of bison be timed to provide a minimum of 12-14 weeks prior to anticipated dates of exposure to virulent field strains of *Brucella abortus*.

5. How frequently should bison be vaccinated? The Committee discussed that due to the time for *Brucella* vaccines to be cleared from bison, it was unlikely that frequent vaccination would be beneficial. The Committee discussed that annual vaccination of all female bison would most likely be most beneficial for maintenance of maximal protection.
6. Can bison be vaccinated too much? The Committee discussed that scientific data on multiple vaccination of bison is very limited. Excluding the possibility of syndromes associated with hyper-immunization, it was assumed that multiple vaccinations would be safe in bison. However, as discussed above, the Committee questioned how beneficial administration of multiple vaccinations would be.

The Subcommittee received one charge from the Chair of Committee on Brucellosis through USDA-APHIS-VS to evaluate the use of *Brucella abortus* Strain RB51 in domestic bison between the age of 12 and 18 months. If the committee recommends the use of this vaccine in this age of animal, the Center for Veterinary Biologics (CVB) will evaluate the recommendation. The Committee agreed to wait for some data being generated by VS and Agriculture Research Service (ARS) prior to making a final recommendation in the next few months. It is important that this future recommendation is regarding safety and serology only, and not about efficacy in bison vaccinated at 12 to 18 months of age with RB51.

The Subcommittee also discussed and supported a Resolution developed by the Subcommittee on Brucellosis in the GYA, regarding *Brucella abortus* select agent status.

## Report of the Feral Swine Subcommittee on Brucellosis and Pseudorabies (PRV)

Carter Black, Chair

The Subcommittee met on Monday, October 26, 2008. At least 28 persons were in attendance, including 11 members of the Subcommittee. Reports were provided on a number of disease issues of interest. A summary of the reports is included below.

Dr. Joseph L. Corn, Southeastern Cooperative Wildlife Disease Study (SCWDS), provided an update on the National Feral Swine Mapping System (NFSMS). SCWDS produced nationwide feral swine distribution maps in 1982, 1988 and 2004 by working directly with state and territorial natural resources agency personnel. In 1982, 17 states reported feral swine in a total of 475 counties. In 2004, 28 states reported feral swine in 1014 counties. With support from United States Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), Veterinary Services (VS) SCWDS has now developed the National Feral Swine Mapping System (NFSMS), an interactive data collection system to be used to collect and display real time data on the distribution of feral swine in the United States (U.S.). The real time feral swine distribution maps are produced using data collected from state and territorial natural resources agency personnel and from USDA-APHIS-Wildlife Services (WS). The real time map is available to be viewed by the public on the NFSMS home page. Distribution data submitted by agency personnel are evaluated by SCWDS on a continual basis, and the real time distribution map updated with verified additions on a monthly basis. Feral swine populations and/or sightings are designated on the map either as established and breeding populations, or as sightings. Currently 33 states are reporting feral swine populations but sightings in additional states are under review. The NFSMS is accessed via the internet at <http://www.feralswinemap.org/>.

Dr. John Korslund provided an update on USDA-APHIS-VS Swine Health Program activities as related to feral swine prepared by Dr. Troy Bigelow. Two cooperative agreement initiative funded by VS programs were reviewed, the feral swine PRV phylotyping work completed by Dr. Hahn, and the feral swine mapping work by SCWDS, both reported on at the Committee meeting. Transitional herd infections were reported for FY2008 (herds indemnified with USDA funds): PRV positive transitional herds Arkansas (1), Texas (2), Michigan (4), Florida (1) and this herd was dually infected with swine brucellosis (SB); SB positive transitional herds indemnified Arkansas(1), Hawaii (1), South Carolina (1), Florida (1) and this herd was dually infected with PRV. PRV and SB risk-based regulations to prevent spread of disease are being developed. A regulatory workplan has been approved by APHIS-VS. Dr. Bigelow will report further on the process in the Committee on Transmissible Diseases of Swine. The revised PRV Surveillance Plan is approved and ready for implementation. Highlighted changes to surveillance streams include: sow boar slaughter surveillance, Jan 2009, decrease samples tested by one-half (750,000 to 380,000), samples tested at two laboratories (Kentucky and Kansas), new surveillance streams including serological analysis stream from diagnostic laboratories, early summer 2009, and NAHLN laboratories antigen sampling.

Mr. Seth Swafford, USDA-APHIS-Wildlife Services gave an update on the USDA-APHIS-Wildlife Services Comprehensive Feral Swine Disease Surveillance Program. Feral swine continue to pose a significant disease risk to the commercial swine industry and the nation's disease status. Wildlife Services (WS) has recently become more involved in conducting a comprehensive surveillance and monitoring project to document diseases that are important to the commercial swine industry and public health. Through a partnership with Veterinary Services (VS), *Classical Swine Fever (CSF) Surveillance Risk Factors 2006* was drafted to identify high risk states. WS partnered with VS to also draft *CEAH's Pathway Assessment of Foot-and-Mouth Disease (FMD) Risk to the U.S. 2001 #405*. A review of the current CSF surveillance activities and upcoming FMD surveillance in feral swine was provided and will be based on the risk assessments. WS currently samples 2300 feral swine for CSF early detection and plans to sample 4000 feral swine for FMD surveillance. Under the current sampling efforts, there have been no positive CSF detections in feral swine in the U.S.

Two endemic diseases of feral swine are also of interest and importance in the U.S. WS is currently working in 30 states to provide baseline data to policy and decision-makers by sampling and testing over 2500 feral swine for swine brucellosis (SB) and pseudorabies (PRV). SB and PRV testing is being

conducted to monitor the bacteria and virus, respectively, to prepare for epidemics, and to support regulation. Monitoring efforts for these pathogens have yielded detections at greater than 30 percent.

Recently, WS was approached by VS, industry representatives, and USDA Agricultural Research Service (ARS) to investigate trichinellosis and toxoplasmosis in feral swine. By accessing its national archive, WS will begin providing feral swine serum samples to ARS for testing. Many local efforts are also underway to investigate porcine circovirus, porcine reproductive and respiratory syndrome, *E. coli*, among other pathogens and diseases in feral swine. By collecting and testing over 2300 feral swine annually for foreign animal diseases and endemic diseases, WS has implemented a comprehensive feral swine disease surveillance and monitoring project.

Dr Greg Hawkins, Texas Animal Health Commission provided an update on regulations in Texas. In Texas, more than two million feral swine populate nearly every one of the state's 254 counties. These animals pose a significant threat to domestic swine and to cattle. On the other hand, hog hunting is a popular and profitable sport in the state. The problem, protecting livestock health, while encouraging trapping and hunting, to keep the population numbers from exploding. Feral swine testing in Texas from August 2003 through May 2007 indicated that 20 percent of the animals were infected with pseudorabies and about 10 percent had swine brucellosis. From January 2003 through June 2008, 26 of 41 domestic swine herds infected with swine brucellosis had either definite or possible contact with feral swine. Furthermore, since January 2006, 27 cattle in 20 herds in Texas have tested positive for swine brucellosis. Prior to 2008, the Texas Animal Health Commission (TAHC) had feral swine regulations, but no authority over the animals. The 80<sup>th</sup> Texas Legislature, in 2007, gave the TAHC authority to make regulations for these animals for disease control purposes only. This includes regulations for specifications for holding facilities and hunting preserves, sale and exhibition restrictions and requirements for movements. The law gave the TAHC the teeth it needed to handle noncompliance with regulations. After months of work by an industry-led committee, including representatives from the Texas Parks and Wildlife Department, hunters, processors and ranch owners, TAHC commissioners adopted new regulations, effective October 1, 2008. In a nutshell, the regulations allow for the trapping of feral swine, but only boars and barrows may be moved to TAHC-authorized hunting preserves. To help control the population, feral sows are destined only for slaughter. Record-keeping and identification requirements are mandated, and failure to comply with the regulations is a Class C misdemeanor, punishable by a \$500 fine. Repeat offenses are a Class B misdemeanor, which can include jail time.

Dr. Edwin Hahn, University of Illinois, reported on progress in a cooperative agreement with USDA-APHIS-VS, Markers for Pseudorabies in Feral Swine. He reported that the transitional herd outbreak in Michigan in 2008 was typed as a virus most closely related to virus from feral swine in the Southeastern states. In contrast, the outbreak in Florida resembled virus of domestic pig origin, similar to the last outbreak in Indiana in 1999. In a study of multiple samples from an Oklahoma herd, extreme variation was seen with many genotypes present in the 20 samples sequenced. This is consistent with a situation where feral pigs from several different sources were mixed for later distribution. Some pigs harbored more than one strain of virus, suggesting dual infection and the possibility of recombination. Although different genotypes were found, no differences in viral pathogenesis for sites of oral infection were found that related to the genetic differences observed. Dr. Hahn is in the process of transferring his technology to National Veterinary Services Laboratory (NVSL) so the genotyping can be continued.

Dr. John Korslund, VS-APHIS-USDA provided an update on PRV and swine brucellosis surveillance plans. The revised PRV Surveillance Plan has been approved by VS for implementation. The plan reduces but targets sampling toward high-risk animals to save costs while improving effectiveness. The 3 objectives of the plan include rapidly detect PRV in commercial herds demonstrate freedom from PRV in U.S. commercial herds, and monitor the risk of introduction of PRV into U.S. commercial swine. Current sampling requirements for 5 percent annual sampling of cull breeding animals will be dropped. New surveillance streams for rapid detection include investigation/diagnosis of suspicious PRV cases, antigen testing of sick pig tissues submitted to diagnostic laboratories, serological testing of swine cases submitted to diagnostic laboratories, serological testing of herds classified as high-risk and voluntary reporting of herds with exposure to feral swine. The two streams utilized for documenting freedom from PRV infection are testing of cull sows identified by official swine program identification methods and market swine slaughtered at selected federally inspected slaughter establishments via premises identification. Activities for monitoring

potential sources of infection include monitor and document the feral swine reservoir, routine summary of number and distribution of swine hunting preserves and monitoring and documentation of international PRV status. The plan will be implemented over the next 3-4 years as components come on line to make parts of the plan feasible. Critical points in implementation include all laboratory work proposed to be transferred to the National Animal Health Laboratory Network (NAHLN) system, sample numbers for proving freedom of infection drop precipitously from 790,000 to 6,000 samples, Animal Health Surveillance and Monitoring System (AHSM) database development critical for measuring performance metrics, targeted sow surveillance will require National Animal Identification System (NAIS) premises ear tags for targeting and automation, premises identification (ID) of market swine lots to ID commercial production grower-finisher segment to allow targeted sampling, feral swine sero-surveillance in targeted populations collected by WS and continuation of classical swine fever (CSF) partnership. Current PRV and swine brucellosis program standards (Uniform Methods and Rules (UMR) must be changed as sampling activities are lowered and targeted or no one will meet 5 percent threshold.

Swine brucellosis surveillance planning is being modeled after the PRV plan, with some differences related especially to assay issues. The basic streams are similar, although sample numbers may be altered based on sensitivity and specificity of assays used. In summary both programs rely on targeted surveillance to allow much lower testing levels while providing enhanced effectiveness. Premises ID is necessary to assign risk and target surveillance based on feral and backyard herd proximities, Data collection and management is critical for effective targeted surveillance, and targeted samples align well within PRV, SB, CSF, and foot and mouth disease (FMD) surveillance objectives, yielding potential program efficiencies through comprehensive planning.

A recommendation was approved and forwarded to the Committee on Transmissible Diseases of Swine. The Subcommittee recognizes a need for a comprehensive review of the PRV Program funding. Concerns that operating under the continuing resolutions have locked the budget at the 2006 level and the program is unable to conduct proper disease surveillance. It is recommended that USDA, state and industry stake holders conduct a comprehensive review of the PRV program funding.

## Report of the Subcommittee on Brucellosis in the Greater Yellowstone Area

Martin Zaluski, Chair

The Subcommittee met on Saturday, October 25, 2008. Subcommittee members are Martin Zaluski, Michael Gilsdorf, PJ White, John Belfrage, Sam Holland (not present), Terry Kreeger, Jim Logan, Chuck Massengill, and Bill Barton. There were 24 visitors also in attendance. The purpose of the Subcommittee is to provide support and recommendations to the Committee on for disease transmission risk management and the eventual elimination of the disease in the Greater Yellowstone Area (GYA). Arising from the highly successful national brucellosis eradication program among domestic livestock and captive wildlife, free-ranging wild elk and bison in the GYA are now recognized as the last reservoir of *Brucella abortus* in the United States. The Subcommittee serves as a forum and clearing house for ideas and proposals that have been submitted to it by state and federal members, industry representatives, researchers, wildlife interests and others.

Dr. Bill Barton, Idaho State Veterinarian, Dr. Jim Logan, Wyoming Assistant State Veterinarian, and Dr. Neil Anderson, Montana Fish, Wildlife and Parks Service, each presented on brucellosis in the GYA. The Subcommittee discussed common threads of what has changed in the GYA states where there is an increased number of documented or suspected wild elk to livestock transmission. Common threads of change that were discussed by all three GYA states of Wyoming, Montana, Idaho include human population increase and demographics; a number of rural communities have increased in size and changed in preference of seeing elk, elk distribution in some areas of the GYA states has altered wintering behavior in location and duration. Elk brucellosis prevalence; overall, the brucellosis prevalence in wild elk has increased in the GYA, and that while wolves have an impact on elk distribution and risk, the impact of wolves is unknown.

Dr. Jack Rhyan, VS-APHIS, presented on immunocontraception technology as a potential method of reducing/eliminating brucellosis in bison in the GYA and recommends that this technology holds some promise and the Subcommittee felt that it should be explored further.

Rick Wallen, Yellowstone National Park, provided an update on the Yellowstone bison population.

Dr PJ White, Yellowstone National Park provided a presentation on a brucellosis risk assessment project currently ongoing as a cooperative effort between the National Park Service, UC Davis, and USDA/APHIS. This project will utilize geographic information system (GIS), information on elk movement, and other factors to answer basic questions on brucellosis transmission in the northern GYA, and identify mitigation activities

Dr. Brian McCluskey, Western Region Director, Veterinary Services, VS-APHIS-USDA, provided a presentation on a National Brucellosis Elimination Zone Proposal.

The Subcommittee developed two resolutions 1) recommending a review of select agent status for *Brucella abortus* and 2) updating the Code of Federal Regulations (CFR) and Uniform Methods and Rules (UMR) for brucellosis to address the risk of transmission from wildlife in the GYA with draft language provided below (note for each section, only the sentence that includes proposed changes are shown below).

Code of Federal Regulations, Title 9 Part 78. 78.1

Definitions. Class Free State or area. (page 266) A State or area which meets standards for classification as a Class Free State or area, except for cattle and domestic bison within an APHIS approved wildlife risk management zone (WRMZ), and is certified as such on initial classification or on reclassification by the State animal health official, the Veterinarian in Charge, and the Administrator. Any reclassification will be made in accordance with §78.40 of this part. Except in an APHIS approved WRMZ, all cattle herds in the State or area in which brucellosis has been known to exist must be released from any State or Federal brucellosis quarantine prior to classification.

CFR Title 9, Part 78.1. Official Adult Vaccinate (page 269). (a) Female cattle or female bison older than the specified ages defined for official calfhood vaccinate and vaccinated by an APHIS representative, State representative, or accredited veterinarian with an ~~reduced dose~~ approved brucella vaccine, ~~diluted so as to contain at least 300 million and not more than 1 billion live cells per 2 mL dose of *Brucella abortus* Strain 19 vaccine~~ or at the dosage indicated on the label instructions for other approved Brucella vaccines, as part of a whole herd vaccination plan authorized jointly by the State animal health official and the Veterinarian in Charge; and (b)(1) Permanently identified by a "V" hot brand high on the hip near the tailhead at least 5 by 5 centimeters (2 by 2 inches) in size, or by an official AV (adult vaccination) tattoo in the right ear preceded by the quarter of the year and followed by the last digit of the year; and (2) Identified with an official eartag or individual animal registered breed association registration brand or individual animal registered breed association tattoo.

(Page 279). Test-Eligible Cattle and Domestic Bison. (e) Cattle and domestic bison which are being moved from within a WRMZ to be used for breeding purposes and are 12 months of age or older

Uniform Methods and Rules (2003)

Class Free State or Area (page 14). Included among the requirements for Class Free status are that the cattle and/or domestic bison herds in the State or area within the State, except for cattle and domestic bison within an APHIS approved wildlife risk management zone (WRMZ), must have remained free from infections with field strains of *Brucella abortus* for at least 12 months. Except in an APHIS approved WRMZ, all cattle and/or domestic bison herds in which field-strain *Brucella abortus* was known to exist must be legally released from quarantine before the area or State can be certified.

Approved Wildlife Risk Management Zone (WRMZ). Any State or area that contains, or is adjacent to, an area where *Brucella abortus*-affected or exposed wildlife animal species resides may maintain a Wildlife Risk Management Zone (WRMZ). The border of the WRMZ shall be determined by an APHIS risk assessment in conjunction with the State Veterinarian, the State Wildlife Manager, and the Area Veterinarian in Charge. For Class Free States that maintain a WRMZ, there will be provisions for maintaining Class Free status, if multiple *Brucella abortus* affected cattle and/or domestic bison herds are detected in the WRMZ within a 12 month period. These provisions include the following: The State Animal Health Authority must sign a memorandum of Understanding with APHIS that defines the coordinated management activities that the State will provide in and around the WRMZ. Within the WRMZ, enhanced brucellosis surveillance procedures must be in place and all Federal and State brucellosis eradication regulations must be followed, and there must be livestock movement controls at the border of the WRMZ. All sexually-intact cattle and domestic bison over 12 months of age within the WRMZ will be individually identified with a permanent official identification device before they leave the WRMZ. All imported-sexually intact cattle or domestic bison must also have a permanent official identification device prior to importation. Any official identification device used must be entered into a USDA-approved process-verified data management system. All herds within the zone must be subjected to an annual individual herd risk assessment and a herd test at least once every three years with the frequency depending on the risk as determined by the herd risk assessment. Cattle or domestic bison being moved out of the WRMZ must comply with the following: Non sexually intact cattle or domestic bison (steers and spayed heifers) can move out of the WRMZ without restrictions, AND All sexually-intact cattle or domestic bison 12 months of age or older being moved out of the WRMZ must be: Negative on an official brucellosis test within 30 days prior to movement unless tested between Aug 1 and Nov 1, then 60 days prior to movement, OR Branded with a hot iron brand "F" on the left hip and move for feeding purposes only, OR Transported directly to an USDA approved slaughter facility in a sealed vehicle.

	<u>For Feeding Purposes</u>	<u>To Breeding herd</u>	<u>Directly to slaughter</u>
<u>Spayed / castrated</u>	<u>No restrictions</u>	<u>N/A</u>	<u>No restrictions</u>
<u>Sexually Intact</u>	<u>"F" brand or tested</u>	<u>For animals 12 mo</u>	<u>Sealed trailer or</u>

	<u>within 30 days prior to movement, or if tested between Aug 1 and Nov 1, 60 days prior to movement</u>	<u>of age or older, tested within 30 days prior to movement, or if tested between Aug 1 and Nov 1, 60 days prior to movement</u>	<u>tested within 30 days prior to movement, or if tested between Aug 1 and Nov 1, 60 days prior to movement</u>
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All female sexually-intact cattle and domestic bison calves born in or imported into the WRMZ must be officially calfhooed vaccinated. Female adult sexually intact cattle may be required to be adult vaccinated with an approved Brucella vaccine as determined by the brucellosis DBE in the State and with concurrence of the APHIS regional brucellosis DBE, the Area Veterinarian in Charge and the State Veterinarian. If brucellosis affected cattle and/or domestic bison herds (herds known to be affected) are found within the WRMZ, the herds must follow all the requirements listed within the most recent brucellosis UM&R and CFR requirements for movement controls and quarantine release. If any cattle and/or domestic bison herd is found affected with *Brucella abortus* within the WRMZ, it will not affect the States Class Free status if the most probable source of the disease is from wildlife and the State implements an approved Brucellosis Management Plan (BMP) within 60 days which defines the brucellosis control and eradication procedures that must be followed at the interface of the wildlife and domestic cattle and domestic bison. These BMP's must be approved by APHIS and the State Animal Health official. The BMP, as well as the criteria for establishing/maintaining the border of the WRMZ, must be reviewed annually and re-approved by a Brucellosis Management Committee (BMC) appointed by the Deputy Administrator. The BMC will consist of the state animal health official, or his/her designee, of any 2 adjacent States not having a WRMZ, the Regional Brucellosis Epidemiologist for APHIS, VS, and a cattle industry representative of any 2 adjacent states not having a WRMZ as recommended by that state's animal health official, a cattle producer, and the state veterinarian from the state with the MOU. If *Brucella abortus* infection is found outside the zone in one or more herds during a 12 month period and the epidemiological investigation indicates the source of the infection is from within the WRMZ, as a result of cattle or domestic bison being moved out of the zone or contact with infected wildlife, the State will lose its brucellosis free status and must follow the existing requirements to regain Class Free status. States that have *Brucella abortus* infected or exposed wild elk or bison shall have existing laws and procedures authorizing responsible State wildlife agencies to manage/mitigate brucellosis risks presented by infected or exposed wild elk or bison to prevent brucellosis transmission to livestock. These agencies shall continue to engage in cooperative, integrated management of migratory ungulates across administrative jurisdictional boundaries in the Greater Yellowstone Area. States shall strive to reduce risk presented by infected or exposed wild elk or bison.

Feedlot—cattle and/or domestic bison (page 17). The feedlot will not be considered a herd if it is a State approved terminal feedlot.

State Approved Terminal Feedlot (new proposed definition). Any feedlot designated as an approved terminal feedlot by the State Animal Health Authority. All animals entering the feedlot must comply with the required movement tests of the brucellosis UM&R and CFR and must be identified with an approved official identification device that allows for tracing of each animal back to its herd of origin. All animals moved out of the feedlot must go directly to slaughter or to another State approved terminal feedlot and must be identified with an approved official identification device.

Official vaccinate (adult) (page 21). A bovine or bison female that, ~~as part of a herd that was approved for whole herd vaccination,~~ was inoculated subcutaneously with an approved *Brucella* vaccine at an age older than that permitted for calfhooed vaccination. At vaccination, the animal must have been properly identified as an adult vaccinate with a Brucella vaccination tattoo and official identification device and must have been reported on the appropriate form to the State or Federal animal health agency in that State.

Testing Requirements. A. Cattle. Official vaccinate (adult) (Page 21). The animal must have been tested negative within 10 days before vaccination, except for animals vaccinated within a WRMZ.

Quarantined pasture (page 23). Quarantined pastures can be approved within a WRMZ. Animals leaving a quarantine pasture located within a WRMZ must comply with the movement and testing controls established for movement within or from the WRMZ.

Chapter 1. Part II. 2. Procedures for Vaccination. C. Identifying Vaccinates (page 34). 2. Official adult vaccinate. To be an official adult vaccinate, the vaccinated animal must be a. ~~Part of a herd approved for whole herd vaccination at the time of vaccination, and~~ b. Female cattle and/or bison vaccinated at an older age than the maximum age approved for calfhood vaccination, ~~and~~ c. ~~Tested negative within 10 days before vaccination, and~~ d. ~~Vaccinated subcutaneously with an approved 2-mL dose of *Brucella abortus* Strain 19 vaccine containing between 300 million and 1 billion live organisms. (The optimum dose is 500 million live organisms.) If the animal was vaccinated before August 15, 1983, the vaccine must have contained between 300 million and 3 billion live organisms, or~~ e. Vaccinated subcutaneously with an approved 2-mL dose of *Brucella abortus* Strain RB51 vaccine containing at least 1 billion live organisms, ~~and~~ f. Vaccinated by a State or Federal animal health representative or by an accredited veterinarian as instructed by the State animal health official and the APHIS AVIC, ~~and~~ g. Identified as an official adult vaccinate as described in Section C, ~~and~~ h. Reported on the appropriate forms as an adult vaccinate to the State or Federal animal health agency for that State.

Chapter 2. Part II. Class Free Status. 1. Size of Area (page 85). A State may also request a WRMZ if they have a known focus of *Brucella abortus* infection in wildlife within the State boundaries.

UM&R. Chapter 2. Part II. Class A Status. 1. Size of Area. A State may also request a WRMZ if they have a known focus of *Brucella abortus* infection in wildlife within the State boundaries.

Chapter 2. Part II. Class Free Status. 3. Standards To Attain and Maintain Class Free Status (UM&R page 88). B. Herd Infection Rate. 1. States, except within a WRMZ, must remain free of brucellosis resulting from infections with field strains of *Brucella abortus* for 12 months or longer.

Chapter 2. Bovine Brucellosis. Part II. Class Free Status. 4. Movement of Cattle and Domestic Bison on Change of Ownership Within and From Class Free States or Areas for Certain Purposes. B. For Feeding. 1. Movements to quarantined feedlots or quarantined pastures (Page 94). Quarantine feedlots may also be approved within a WRMZ as needed for the movement of cattle and domestic bison from anywhere within the zone to the quarantine feedlot.

UM&R. Chapter 2. Part II. Class A Status. B. Herd Infection Rate (UM&R page 98). *Brucella abortus* affected cattle and domestic bison herds within the State's WRMZ will also be included in the State accumulated 12-month herd infection rate.

## National Brucellosis Elimination Zone Proposal

Brian McCluskey  
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As the cooperative State-Federal brucellosis eradication program nears its goal of eliminating *Brucella abortus* from U.S. livestock herds, the persistence of brucellosis in bison and elk in the Greater Yellowstone Area (GYA) remains problematic because of continued exposure to livestock. Although all 50 States achieved Class Free status early in 2008 for the first time in the brucellosis eradication program's 74-year history, this milestone was tempered by the discovery of newly affected herds near the GYA. In the past few years, brucellosis has been intermittently detected in domestic livestock in Idaho, Montana, and Wyoming, the States surrounding the GYA, where wild bison and elk populations are known reservoirs of infection. Numerous organizations, agencies, committees, and individuals have worked toward the ultimate goal of eliminating brucellosis from domestic livestock and wildlife in this area. The Greater Yellowstone Interagency Brucellosis Committee (GYIBC) has coordinated Federal and State brucellosis research and management activities in the GYA since the mid-1990s. Despite these and other efforts to solve the brucellosis problem, several recent brucellosis cases have been detected among livestock herds in the GYA, with epidemiological and genetic evidence indicating infected elk as the source. These outbreaks have resulted in the reclassification of the affected States, impacted the livestock industry, and increased scrutiny of wildlife management policies. The likelihood of further spread of brucellosis to livestock in the GYA presents a significant challenge to livestock owners and regulators, as well as land and wildlife managers within the region. To assist the three States in the GYA, the Animal and Plant Health Inspection Service's (APHIS) Veterinary Services (VS) branch is proposing to create a designated National Brucellosis Elimination Zone (NBEZ). The establishment of this zone would facilitate the elimination of brucellosis from livestock and provide clear, consistent control and surveillance guidance to livestock producers in the NBEZ, while simultaneously allowing the balance of the United States to be considered free of bovine brucellosis.

In this proposal, VS intends to introduce how regionalization concepts would be applied to the GYA, justify application of these concepts, demonstrate how this plan would be accomplished, and stimulate critical feedback from partners and stakeholders. Further efforts are required to ensure successful implementation of any plan, including a risk assessment to determine the zone boundaries and appropriate surveillance and mitigation strategies; specific implementation strategies; and a communication plan to maintain the valuable dialogue between partners, stakeholders, and the public. Implementation of the NBEZ requires a concurrent planning effort with the many wildlife agencies and entities in the GYA. Consideration of the GYA as an entire ecosystem should drive this planning process with development of potential strategies to eliminate brucellosis from bison and elk in the GYA.

### **Justification and Support.**

The World Organization for Animal Health (OIE) adopted the concept of regionalization to define distinct subpopulations (herds) for disease control and international trade purposes. These concepts will be applied to the NBEZ to improve upon ongoing disease control efforts. According to the OIE, a zone or region is a clearly defined part of a country containing an animal subpopulation with distinct health status, with respect to a specific disease, for which required surveillance, control, and biosecurity measures have been applied for international trade purposes. Historically, U.S. disease eradication programs such as tuberculosis, pseudorabies, and brucellosis have relied on a regionalized approach on a State-by-State basis. This method has been effective for disease control because eradication program standards allow States to enforce interstate movement and testing requirements. Although regionalization at the State level has been effective, it can be costly for States when only a few livestock herds in a small geographic area are identified as affected. For brucellosis, when an affected livestock herd is identified anywhere in a State, the entire State is downgraded to the next lower level of classification in accordance with title 9, Code of Federal Regulations (9 CFR), section 78.40. When a State is downgraded, all producers in that State must meet the additional testing and mitigation requirements. The downgrade results in a costly situation for producers as well as State and Federal governments. To minimize the impact to a whole State during an outbreak situation, 9 CFR 78.40 and the Brucellosis Eradication Uniform Methods and Rules (UM&R), October 2003, allow States to designate a two-area classification, called split-State status, in which one area has a separate brucellosis classification from the rest of the State. One benefit of split-State status is that areas

considered free of brucellosis may ship livestock interstate and internationally with minimal restrictions. However, the application process for split-State status can take over a year to complete. States are responsible for the majority of the workload and are required to have the legal and financial resources necessary to implement the zone. In addition, split-State status currently requires a regulatory change each time; therefore, increasing or decreasing the size of the zone as risks change can be difficult and burdensome for the State.

As an alternative to split-State status, APHIS-VS is proposing to define a high-risk zone for livestock, the NBEZ, to reduce the impact of brucellosis in the affected GYA States. This proposal would offer several advantages. Similar to split-State status, creation of the NBEZ would allow the remainder of the State to maintain its brucellosis free status. However, the NBEZ would allow flexibility in modifying the boundaries of the zone as the risks associated with *B. abortus* change. In contrast, split-State status would require a new application to redefine the classification areas, delaying the designation. Management of the NBEZ would be a collaborative State-Federal effort, reducing the burden on each individual State and creating a more effective way to work toward brucellosis elimination in these livestock populations. The key to the plan's success is participation from all three impacted States. The efforts of the States and other organizations with a vested interest in the status of brucellosis in the domestic livestock and wildlife of the GYA will be integrated during the development of the NBEZ. This zone would encompass an area around the GYA where potential exposure to *B. abortus* could occur. The official NBEZ boundaries will be established based on a risk assessment that considers current brucellosis surveillance and control practices in both livestock and wildlife in the GYA, the risk factors associated with transmission of brucellosis, and other ecological factors. Successfully eliminating brucellosis will require enhanced surveillance and mitigations to ensure early detection of affected herds and to prevent spread of *B. abortus* outside of the NBEZ. Implementation of this concept would allow the remainder of each State outside the NBEZ to maintain Class Free status regardless of detection of disease in livestock within the NBEZ. For the rest of the United States, creating a zone around the GYA for brucellosis management in livestock would ensure that international trade of U.S. cattle continues uninterrupted in compliance with OIE standards.

### **Proposed Action Plan.**

**Risk Assessment.** As one of the first steps to establish the NBEZ, APHIS-VS will conduct a risk assessment to ensure the evaluation of all factors that may increase the risk of *B. abortus* transmission to livestock within and outside the NBEZ. Using the OIE concept of regionalization, the assessment will utilize current knowledge of brucellosis epidemiology and ecology in the GYA to establish the boundaries. Simultaneously, a herd-risk scoring tool will be developed to allow for the tiering of risk among herds within the NBEZ.

**Identification of the NBEZ.** To create the NBEZ, an area where herds are at greater risk of *B. abortus* exposure than surrounding populations will be identified. Epidemiological, ecological, and geographic factors will be used to define a zone with distinct and identifiable boundaries that contain a majority of the potential risk factors for *B. abortus* exposure. Procedures to establish the NBEZ will include identification and assessment of all pathways of potential spread of *B. abortus*. This task will incorporate current scientific knowledge of the ecology, epidemiology, and disease dynamics of *B. abortus* in domestic livestock and free-ranging bison and elk. Information from investigations of brucellosis outbreaks in livestock, as well as surveillance in domestic livestock and wild populations of bison and elk, will also help identify potential risk pathways. To define the NBEZ boundaries, this information will be combined with data describing the distribution and ecology of bison and elk populations in the GYA, including migratory behavior and routes, overwintering areas, calving areas, and use of areas occupied by livestock. In addition, data on management of wild bison and elk such as feed ground use and location and hazing of bison will be considered. This information will be used to determine areas of greatest likelihood for contact between livestock and free-ranging bison and elk, and potential livestock exposure to *B. abortus*. Disease risk is not static and can change significantly over time as production practices change, exposure mitigations are implemented, and disease management of free-ranging bison and elk populations improves. Because the system is dynamic, the NBEZ boundaries may be redefined as new data become available. This will continually ensure that the risk of exposure is adequately contained while the impact to livestock in the adjacent free zone is reduced, and surveillance and mitigation requirements are not unnecessarily imposed on herds no longer considered at significant risk.

**Risk-based approach to herd management within the NBEZ.** States and other entities and organizations have developed multiple herd-level risk classification tools, such as herd plans and risk factor

scoring. However, these tools and their implementation vary by State. APHIS-VS and States will develop a herd classification system that integrates existing tools with the goal of standardizing efforts in all three States. A risk scoring system will be used to assess herd risk based on producer-identified risks (e.g., elk presence on property), management practices, and biosecurity. Risk levels may be further defined based on other factors, such as proximity to elk feeding grounds, elk and bison population levels, and seroprevalence rates of *B. abortus*. The risk tool will provide a standardized method for producers and animal health officials to define a herd's risk of acquiring brucellosis, identify needed mitigation to reduce risk, conduct surveillance to assure early detection, and allow movement with confidence of a herd's freedom from brucellosis. Livestock producers may have the opportunity to improve their herds' risk score by adopting mitigation strategies associated with the identified risk factors. Producers within the NBEZ will use their herd risk scores to choose which herds they add to or allow to mingle with their herds, under guidelines similar to existing herd certification programs. However, a herd's risk status will be raised if producers add from or mix with herds of a higher risk status.

### **Mitigations**

**Surveillance.** Surveillance procedures for brucellosis currently depend on the State's class status. Generally, when a State's classification is lowered, surveillance is increased, which raises costs to the producer and the State. By developing a tiered surveillance scheme that addresses surveillance outside and within the NBEZ, States will be able to utilize their resources more for brucellosis detection and elimination by focusing efforts on their portions of the NBEZ. Although this plan focuses on addressing domestic livestock, it is important to note that effective wildlife surveillance and control implemented concurrently within the NBEZ will provide higher confidence of disease detection in livestock.

**Surveillance outside the NBEZ.** Depending on the findings of the risk assessment, surveillance in areas of Idaho, Montana, and Wyoming outside the NBEZ may need enhancement to ensure rapid detection of disease due to intrastate movement of animals from inside the NBEZ. Meeting these requirements will allow Idaho, Montana, and Wyoming to maintain Class Free status outside the NBEZ. States outside the GYA will continue surveillance under the established national protocols for maintaining Class Free status per the Brucellosis Eradication UM&R. In those areas, surveillance streams used to evaluate brucellosis status will continue to include bovine brucellosis slaughter surveillance, milk surveillance using the brucellosis ring test in dairy herds, first-point testing (market surveillance), and abortion screening. Livestock moved from within the NBEZ to slaughter or feedlots outside of the NBEZ or outside Idaho, Montana, and Wyoming may need to be specifically targeted for surveillance testing, preferably using electronic animal movement information and mandatory identification.

**Surveillance in the NBEZ:** Within the defined NBEZ, brucellosis surveillance will be increased to ensure rapid detection of affected herds and prevent movement of *B. abortus* out of the zone. An appropriate level of surveillance will be recommended for all herds located inside the NBEZ. The risk scoring system described above will be utilized to establish herd-specific surveillance protocols. Testing requirements for the lower-risk herds will be set to equal the minimum level for the NBEZ. Higher-risk herds will be subject to greater surveillance requirements. Herd-level surveillance will include movement testing, investigations of abortion events, and serologic testing of herds. Again, the amount and frequency of herd testing required will depend on the herd-risk status.

**Additional mitigations.** In order to prevent the spread of brucellosis within and outside of the NBEZ, several mitigation practices may be adopted. Electronic movement certificates and animal identification should be used for animals leaving the NBEZ to ensure compliance with appropriate testing requirements. This will also ensure that effective trace investigations associated with affected livestock can be performed. Additional mitigations, such as vaccination and restricting movement of livestock only to slaughter, may also be applied.

### **Implementation**

**Regulatory changes.** Official establishment of the NBEZ will require regulatory changes at the Federal level. The necessary rulemaking to establish the zone according to internationally accepted guidelines will require many months to complete. The rule, however, will allow for more flexibility in modifying the zone boundaries as conditions change. Prior to publishing the official rule that will develop the zone, APHIS-VS intends to work in close partnership with the GYA States to establish the zone boundaries and concomitant standardized surveillance activities, mitigations, and movement controls. Rapid implementation of consistent, focused disease elimination and control strategies in the zone is in the best interest of Federal

and State animal health officials and producers. Initial implementation of many of these strategies does not require regulation but only the cooperative efforts of State, Federal, and producer entities. Regulatory changes at the State level will also be required, with particular attention needed on requirements for movement of livestock outside of the zone. APHIS will begin work immediately to establish zone boundaries following stakeholder and partner acceptance of the NBEZ concept.

**Oversight and monitoring.** State animal health officials and producer groups have worked extensively to create herd risk assessment tools, herd plans, surveillance techniques, and suggested regulatory changes. APHIS-VS will work closely with these groups to assist with standardizing these tools, leveraging them for appropriate application across the entire NBEZ. A toolbox of surveillance approaches, disease mitigation strategies, risk assessment approaches, and herd plans will be developed and made available to all partners and stakeholders. State and Federal animal health officials will share the use of these tools. For example, the location of a Federal or State veterinary medical officer will determine who will conduct a herd risk assessment and develop a herd plan. Oversight and monitoring of herd plans will be the State animal health official's responsibility, as it is currently. This approach will continue the long-standing cooperative effort between State and Federal officials in the brucellosis program.

**Mitigation implementation and enforcement.** Implementing appropriate levels of surveillance within the zone will be critical to demonstrate mitigation and movement control effectiveness. As with any surveillance effort, the collection, validation, and reporting of accurate surveillance data facilitates the demonstration of effectiveness and allows for rapid response to detections of disease. Existing data collection and management systems, including the Mobile Information Management System (MIMS) brucellosis application, the Animal Health Surveillance and Monitoring System (AHSM), and components of the National Animal Identification System (NAIS), will be used to enhance surveillance capabilities in the NBEZ. Individual State and Federal animal health officials will be responsible for meeting the established surveillance standards, including reporting deadlines and criteria within their States. Livestock movement controls will be implemented to assure the States that the risk of disease spread outside the zone is minimal. As mentioned previously, individual State authorities will be responsible for enforcing movement controls, such as ensuring that only low-risk cattle are moving, without brucellosis testing, outside the zone or that high-risk cattle are moving only to slaughter or feeding operations where the risk of spread is controllable. A key component to effective movement control will be the zone-wide implementation of premises and animal identification. This will be combined with other efforts such as check stations, permitting, electronic movement certificates, market surveillance, slaughter surveillance, and frequent record review to provide necessary confidence in the risk mitigations employed. APHIS-VS, primarily at the VS Area Office level, will work closely with State animal health officials to continuously monitor movement information and provide rapid service to producers needing to transport livestock outside the NBEZ.

**Wildlife.** The NBEZ concept presented here is only part of a successful approach to brucellosis elimination in the GYA. Implementation of the NBEZ requires a concurrent planning effort with the many wildlife agencies and entities in the GYA. Consideration of the GYA as an entire ecosystem should drive this planning process with development of potential strategies to eliminate brucellosis from bison and elk in the GYA. Numerous points exist for integration of these efforts. The Interagency Bison Management Plan has outlined strategies requiring concerted efforts for adequate spatial-temporal separation of bison and livestock. A coordinated approach to surveillance in both domestic livestock and wildlife (e.g., serologic testing and observation of abortions or orchitis) is also critical to ensuring control and elimination of brucellosis in the GYA. APHIS-VS is eager to partner with wildlife agencies and entities in the wildlife brucellosis planning effort.

## **Resources**

An accurate estimate of the resources needed to establish and then maintain the NBEZ will not be possible until boundaries are determined, surveillance levels established, and mitigation strategies developed. Additional financial resources in the GYA States will be necessary. These funds will support additional field and technical personnel, vehicles, laboratory activities, travel, supplies, administrative and analytical support, producer incentives, and vaccination, among other needs. APHIS-VS is currently developing an updated national brucellosis surveillance plan. The plan will incorporate strategies that include, but are not limited to, laboratory consolidation, standardizing test protocols, redirecting surveillance funds, and communication to stakeholders regarding potential changes to current brucellosis surveillance components. APHIS-VS intends to redirect resources gained from the restructured national surveillance

system to the NBEZ, the area of highest brucellosis risk. In fiscal year 2008, APHIS-VS allocated approximately \$2.5 million to brucellosis work in the GYA States. These funds were used for cooperative agreements with the GYA States and universities, and for APHIS-VS personnel and activities in VS Area and Regional Offices. Total contributions from States and producers are unknown but substantial. APHIS-VS, States, and producers will continue to jointly provide the financial and personnel resources needed to create and maintain the zone.

### **Conclusion**

Elimination of *B. abortus* from the United States is nearly complete, with only a nidus remaining in wildlife reservoirs in the GYA. This problem has affected the brucellosis status of the States surrounding the GYA, adding costs and burdens to all producers. Designation of the NBEZ would allow the remainder of the United States, including the areas outside the NBEZ in Idaho, Montana, and Wyoming, to maintain Class Free status even if an affected herd is found in the zone, thus minimizing trade and movement restrictions. In addition, creating the NBEZ would allow greater flexibility than Split-state status in redefining zone boundaries as the natural history of brucellosis evolves in the GYA. A cooperative State-Federal effort to establish the NBEZ and efficiently utilize resources in affected States would allow the United States to eliminate brucellosis in both livestock and wildlife. To succeed, this effort will require the continued partnership of APHIS-VS with States, agencies, and industry, as well integrated planning and implementation efforts with wildlife agencies and interest groups.

## Status Report – Fiscal Year 2008, Cooperative State-Federal Brucellosis Eradication Program

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USDA-APHIS-VS

For the first time in the 74-year history of the Brucellosis program, all 50 States, Puerto Rico, and the U.S. Virgin Islands were simultaneously designated brucellosis Class Free for a brief period of time in fiscal year (FY) 2008. This accomplishment was made possible thanks to the diligent and cooperative efforts of Federal, State, and industry partners. This milestone occurred when Texas was declared brucellosis free on February 1, 2008. However, in May 2008, the State of Montana disclosed a second brucellosis affected cattle herd within a twenty-four month period of time, resulting in reclassification to brucellosis Class A State status on September 3, 2008.

Brucellosis program eradication efforts have been successful in eliminating the disease from our national cattle herds. Depicted below is the most recent ten-year history of the numbers of brucellosis-affected cattle herds disclosed and their location by State status. The number of brucellosis affected cattle herds ranges from a high of twenty-seven in 1999 to a low of one in 2007. Continuing surveillance activities after achieving Class Free State status is essential, as evidenced by the disclosure of brucellosis-affected herds in Class Free States in recent years.

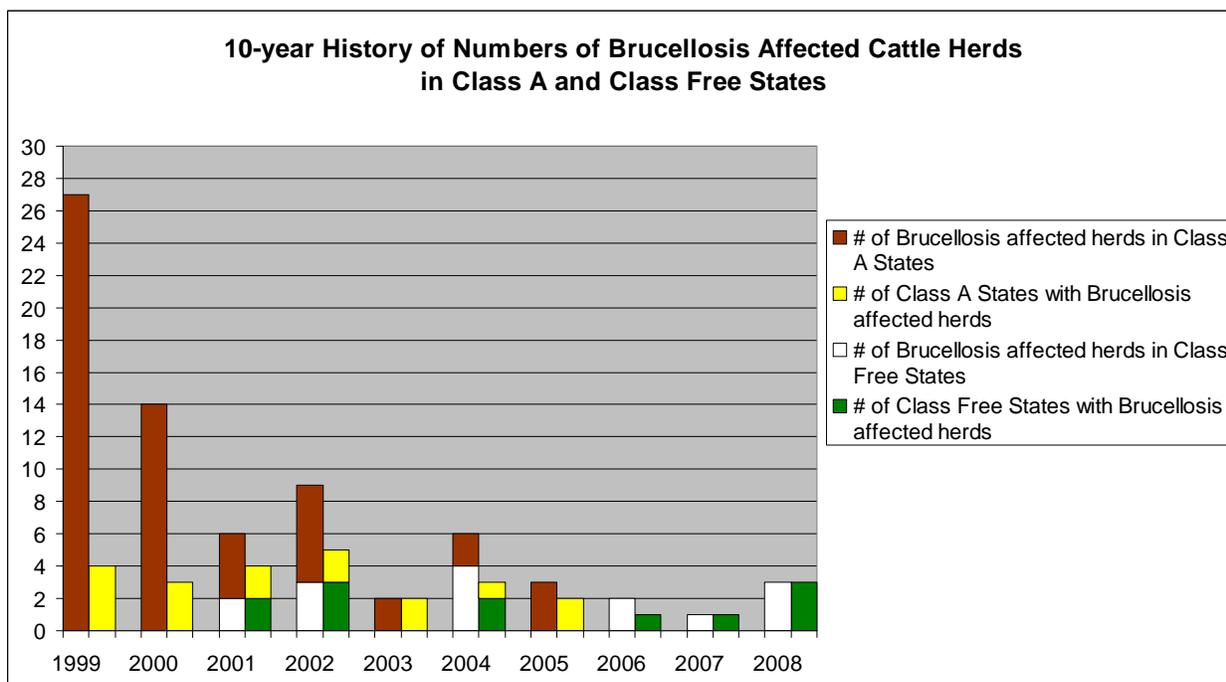


Chart by John D. Thompson, VPA, USDA APHIS VS RHP

### Brucellosis affected herds disclosed in FY 2008

In January 2008, an epidemiologic investigation involving a research herd at Louisiana State University (LSU) was completed. The index herd was determined to have been exposed to a research strain of *Brucella*. The single infected animal, which was test negative on prior annual herd certification testing, was removed. The rest of the herd tested negative, remains under quarantine, and is under an intensive herd plan that includes a comprehensive testing regimen and strict movement controls for the next 2 years. All adjacent herds, source herds, and contact herds were identified and tested; no additional brucellosis affected herds were disclosed.

On June 9, 2008, APHIS confirmed *Brucella abortus* in a cow originating from a cattle herd in the Paradise Valley area of Montana. This herd was tested as part of Montana's efforts to test and develop brucellosis risk mitigation herd plans for herds near the Greater Yellowstone Area. The brucellosis affected herd was depopulated with indemnity and a thorough epidemiologic investigation conducted. No additional

brucellosis affected cattle herds have been disclosed to date. Infected free-ranging elk are thought to be the most likely source of infection. A year earlier, in May 2007, a single brucellosis affected was also disclosed in Montana. With the finding of two brucellosis affected herds within twenty-four months, Montana no longer met the conditions for Class Free status and was subsequently reclassified to Class A State status via the publication of an interim rule on September 2, 2008. The reclassification requires the testing of certain classes of cattle for brucellosis prior to interstate movement. Until this time, Montana had been classified brucellosis Class Free status June 3, 1985. The loss of Montana's status demonstrates the importance of remaining vigilant. The presence of brucellosis in wildlife populations, such as the free-ranging bison and elk in Yellowstone National Park and Grand Teton National Park, remains a challenge, threatening the brucellosis status of surrounding States.

On June 30, 2008, APHIS confirmed *B. abortus* in two cows originating from a cattle herd in Sublette County, Wyoming. These animals were tested as part of Wyoming's first-point testing at livestock auction markets. Testing of the herd of origin revealed additional reactor classified animals on each of three successive herd tests. The brucellosis affected herd was subsequently depopulated with indemnity and a thorough epidemiologic investigation conducted. No additional brucellosis affected cattle herds have been disclosed. Infected free-ranging elk are thought to be the most likely source of infection. Brucellosis regulations provide for a State to maintain Class Free status provided the single affected herd is depopulated and a thorough epidemiological investigation is completed (including all associated herd tests) within 60 days, and no additional affected herds are disclosed. If another affected herd is found within 24 months, Wyoming would be subject to reclassification to Class A status. In February 2004, Wyoming lost its Class Free status in this manner after the disclosure of four brucellosis affected herds. Wyoming was successful in regaining Class Free State status in September 2006.

### **Brucellosis Surveillance Planning**

An evaluation of the current brucellosis surveillance program identified redundancies in surveillance activities. Working to eliminate these redundancies and provide effective and efficient surveillance, a Brucellosis Surveillance Planning Workgroup developed a proposed plan that consists of reducing slaughter surveillance, eliminating brucellosis milk surveillance testing, eliminating Federal funding for first-point testing in States where it is not required, and standardizing slaughter surveillance testing using the rapid automated presumptive test and the fluorescence polarization assay for initial slaughter surveillance sample screening.

To further the development of a National Brucellosis Surveillance Plan, the NSU is developing options for a national surveillance system that is, in part, based on criteria such as the length of time a State has been considered free of brucellosis as well as the movement of high risk cattle. Brucellosis surveillance planning will include consideration of specific needs associated with development of a National Brucellosis Elimination Zone plan for the Greater Yellowstone Area (GYA). Brucellosis-infected wildlife, primarily elk, in the GYA have been implicated in the transmission of brucellosis to cattle herds in the GYA in the past 4 years.

### **Brucellosis Laboratory Consolidation**

APHIS' National Surveillance Unit (NSU) is working with the Brucellosis Laboratory Consolidation and Testing Standardization (BLCTS) Working Group to assess laboratory capabilities for bovine brucellosis slaughter surveillance sample testing. The assessment will evaluate economies of size in the laboratories and the potential for consolidating brucellosis slaughter surveillance testing. The objectives of the brucellosis laboratory consolidation plan are to increase cost efficiency of slaughter surveillance testing, increase effectiveness by standardizing slaughter surveillance testing, and maintain testing accuracy and timely reporting of results. This assessment will ensure that APHIS creates an efficient and effective brucellosis slaughter surveillance system. This is both an economic issue and an issue of integrity for the U.S. brucellosis surveillance program as recognized in national and international trade.

### **Brucellosis/NAIS Integration Feasibility Project**

The Brucellosis/NAIS Integration Feasibility Project was initiated in January 2008. The project is to develop, test and support a scalable solution for brucellosis electronic field data collection, using NAIS standards, to enhance national animal disease traceability and surveillance and brucellosis program management. The system design provides data capture events and reports as defined by the program. In

addition, the project design would collect data that would be used for traceability reporting and cost/benefit analysis of the brucellosis Mobile Information Management (MIM) application.

The use of radio frequency identification (RFID) devices facilitates MIM use in the field. However, RFID eartags are not necessary to use the MIM application. Data can be manually entered. Initially all identification, breed, age, sex, vaccination status data is collected upon the initial use of the MIM application during a brucellosis event. During subsequent events, collection (either manually or electronically) and recording of the individual animal data is achieved upon entry of an official identification device in the MIM application. The brucellosis MIM application has been used in Montana and Wyoming and well accepted by State and Federal animal health regulatory field personnel and livestock producers.

The brucellosis MIM application is similar in design and function to the tuberculosis MIM application, thus facilitating usage of the data collection devices, transmission of data, and development of program reports. This similarity also reduces the amount of training and time to become proficient in the use, by field personnel, of both applications.

Brucellosis – Greater Yellowstone Area (See Time Specific Paper by Mcluskey included in the Committee Report)

### **Brucellosis Program Surveillance Activities**

*[The following surveillance statistics for the cattle brucellosis eradication program is based on data available as of October 15, 2008. Normal data reporting time allowances for states to gather and submit monthly data preclude ascertainment of all data for FY 2008.]*

Fiscal Year (FY) 2008 began with 49 States and three Territories classified at Brucellosis Class Free state status and one state, the State of Texas, classified at Brucellosis Class A State status. FY 2008 ended with 49 States and three Territories classified at Brucellosis Class Free State status and one state, the State of Montana, classified at Brucellosis Class A State status. After successfully completing all program regulatory requirements, the State of Texas officially attained Class Free State status on February 1, 2008. The State of Montana was officially reclassified to Class A State status on September 3, 2008 pursuant to the finding of a second brucellosis-affected herd within twenty-four months.

Cattle herd inventories in the U.S. at the end of FY 2008 were distributed as follows: 1.26 percent of all cattle herds were located in the single Brucellosis Class A state; 23.57 percent of all cattle herds were located in states classified as Brucellosis Class Free for five years or less; 25.59 percent of all cattle herds were located in states classified as Brucellosis Class Free status for six to ten years; 18.87 percent of all cattle herds were located in states classified as Brucellosis Class Free status for eleven to fifteen years; 8.29 percent of all cattle herds were located in states classified as Brucellosis Class Free status for sixteen to twenty years; and 22.42 percent of all cattle herds were located in states classified as Brucellosis Class Free status for more than twenty years.

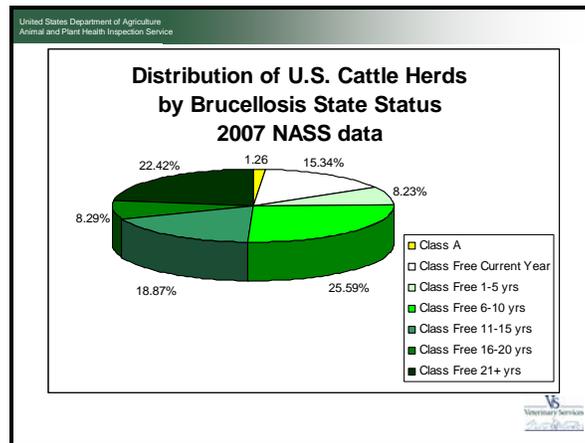
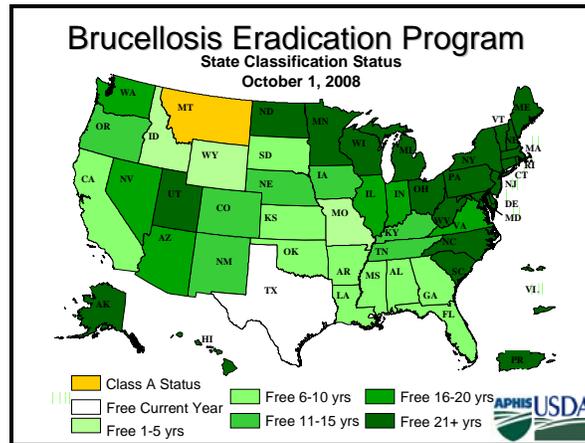
The FY 2008 national herd prevalence rate for bovine brucellosis was 0.0003 percent. Three brucellosis affected cattle herds were disclosed in FY 2008. Affected herds were identified via annual herd certification testing, herd testing as part of surveillance and high-risk herd management, and first-point testing at a livestock market. Per recommendations outlined in the Brucellosis Emergency Action Plan (BEAP), the two brucellosis affected herds located in the high-risk area of the Greater Yellowstone Area were depopulated with indemnity. The third herd, a research herd, is under quarantine and is subject to a comprehensive herd plan including quarterly herd testing.

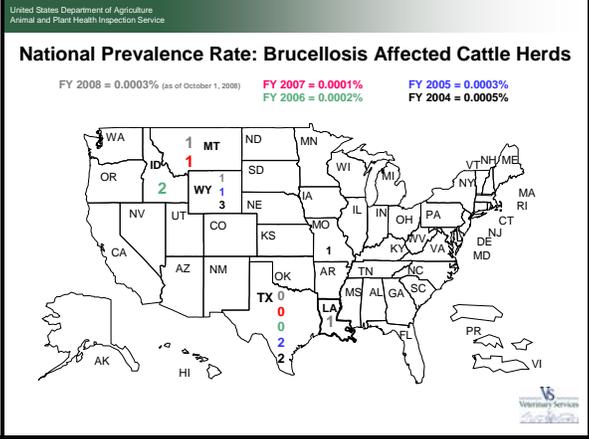
Maintaining Brucellosis state status focuses on continual surveillance activities. Two primary surveillance activities are conducted for bovine brucellosis, Market Cattle Identification (MCI) testing and Brucellosis Milk Surveillance Testing (BMST). During FY 2008, approximately 7.349 million head of cattle were tested under the MCI surveillance program. Per the Brucellosis program standards, blood samples are collected from a minimum of 95 percent of all test-eligible slaughter cattle as part of the MCI surveillance activities. Preliminary tallies indicate blood samples were collected from approximately 94.3 percent of all test-eligible slaughter cattle in FY 2008. First-point testing at livestock markets is required in Brucellosis Class A states. Several Brucellosis Class Free states continue to conduct first-point testing at markets to facilitate interstate movement of cattle and enhance surveillance activities. Brucellosis program standards provide for a minimum of 90 percent successful traceback of all MCI reactor cattle and a minimum of a 95 percent successful case closure rate. In FY 2008, approximately 97.24 percent of all MCI reactors were successfully traced, all leading to successful case closures.

Approximately 629,100 additional head of cattle were tested on farms or ranches during FY 2008, bringing the total cattle tested for brucellosis in FY 2008 to approximately 7.978 million head. BMST

surveillance is conducted in all commercial dairies – a minimum of two times per year in Class Free states and a minimum of four times per year in Class A States. Suspicious BMSTs are followed up with an epidemiologic investigation. Dairy herd inventory data reported on state’s annual reports totaled approximately 61,250 dairy operations in the U.S in FY 2008. Approximately 138,000 BMSTs were conducted in FY 2008; approximately 110 BMSTs yielded suspicious results after repeat screening (repetitive BRT and/or HIRT). All suspicious BMSTs in FY 2008 were confirmed negative by subsequent epidemiologic investigations and additional herd testing. There were approximately 3.799 million calves vaccinated for brucellosis in FY 2008. The national calfhood vaccination policy recommends proper calfhood vaccination in high risk herds and areas and whole herd adult vaccination when appropriate in high risk herds and areas. Elimination of mandatory vaccination in all states is also recommended.

The reclassification of Montana to Class A State status in FY 2008 demonstrates the importance of remaining vigilant. The presence of brucellosis in free-ranging bison and elk in the GYA threatens the brucellosis status of the surrounding States and the health of their livestock herds. As a result, final eradication of brucellosis from the United States continues to be a challenge.





## Status of the Campaign against Brucellosis in Mexico

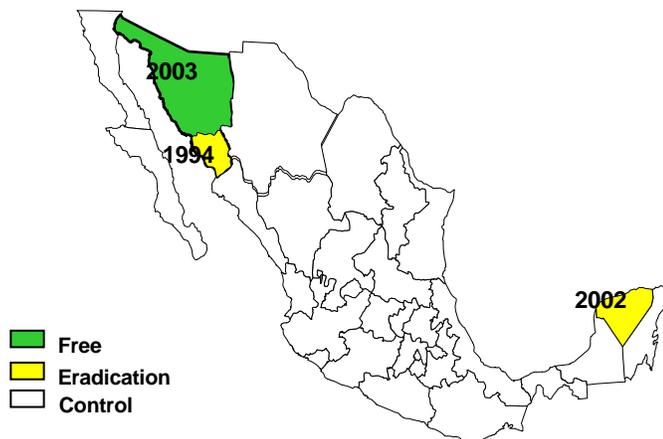
Alfredo Gutierrez  
Mexico

The current regulations that support the campaign of eradication against brucellosis in Mexico is the Federal Law of Animal Health. – Published on July 25th 2007. The Official Norm “NOM-041-ZOO-1995”, “National Campaign against Animals Brucellosis” is being updated by a Technical Subcommittee with 70 percent modification advancing

### Historic Budget

The brucellosis eradication campaign budget from 2000 to 2008 is of 616.2 million Mexican pesos, and in 2008 it was 89.3 million Mexican pesos.

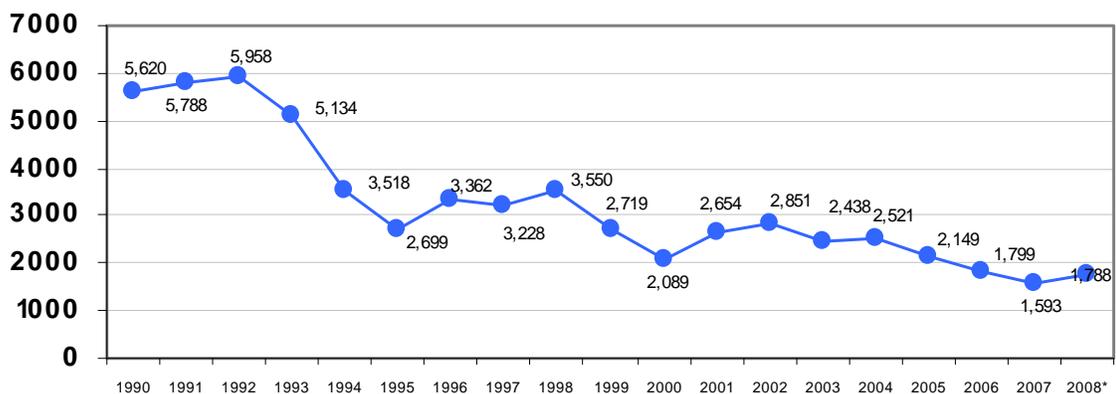
Classification of Mexican States According to NOM-041-ZOO-1995



Mexico

Incidence of Human Brucellosis in

The decline in incidence of human *Brucella* is derivative of animal disease eradication efforts.



\*update September/ 30Th / 2008 . Week 41. EPIDEMIOLOGY GENERAL DIRECTION/PUBLIC HEALTH MINISTRY

### Strategic Planning for the National Campaign for Brucellosis Eradication

A Strategic Plan for the campaign of eradication of brucellosis was completed at Tequiquiapan, Queretaro on September 30, 2008. Highlights of the Strategic Plan are:

Brucellosis eradication program will adopt the focus of the zoo-sanitary condition and infrastructure of the tuberculosis (TB) Campaign, including: Identification of zoosanitary coincidence areas between the two eradication programs; Perform the brucellosis diagnosis at A zones; Increase the current infrastructure with other zones and animal species; Training system for brucellosis specialist personnel; To take advantage of the current TB slaughter surveillance program; and incentives for Origin Certification of herds.

Increasing vaccination with a highly promoted incentive promotion, including: Vaccine standardization; Quality production and distribution controls; Vaccine management training of veterinarians and distributors about transport, storage, uses and application techniques.

A mobilization control system, including: Training for movement documentation centers and checkpoint personnel; Checkpoints performing as Zoosanitary Service Centers; Cancellation of the Zoosanitary Movement Certificate when a shipment arrives to the destination with a notification system to the origin; All ruminant movement must be with negative brucellosis test.

Communication and training programs, including: distribution of educational materials to advertise the campaign image; replicable training for epidemiology of brucellosis for all States; national program for education of general population about brucellosis eradication campaign; education of consumers about the importance to buy products free of brucellosis; periodic meetings and training forums for cattlemen and veterinarians about the control and eradication of brucellosis.

### **International Recognition**

The state of Sonora has intensified efforts to fulfill SUDA regulations for Class A Status, including: Surveillance traces reaches 95 percent of slaughter of animals older than 2 years; Monitoring the brucellosis milk surveillance testing (BMST) in stables: 4 rounds per year (at least); Herd blood test in stables, those who fail to meet the 4 rounds or as a positive brucellosis ring test; Reaching 95 percent of success in tracing animals reactors monitoring in traces and Tests on animals in buffer zones; Strict control for livestock introduction into Sonora; Quarantines released by depopulation or negative tests in a period of not less than 1 year; Proficiency tests panels to evaluate the performance of diagnostic laboratories including validation of the technical and personnel (proficiency testing) by SAGARPA's Official Central Laboratory; Recognition of veterinarian specifically trained in epidemiology of brucellosis with the faculties to classify herds and animals infected on the basis of information composed of each case.