REPORT OF THE COMMITTEE ON CAPTIVE WILDLIFE AND ALTERNATIVE LIVESTOCK

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The Committee met on November 14, 2010 at the Minneapolis Hilton Hotel in Minneapolis, Minn., at 12:30 p.m. There were 32 members and 40 guests present.

Committee Presentations

An Update of Animal Care Activities

Chester Gipson, DVM; Deputy Administrator, USDA-APHIS-Animal Care

Dr. Gipson presented a summary of activities by USDA-APHIS, Animal Care during the past year.

Update on vaccination of white-tailed deer with *Mycobacterium bovis* BCG: Safety and Efficacy

Mitchell V. Palmer, Tyler C. Thacker, W. Ray Waters; National Animal Disease Center, USDA

In 1994, white-tailed deer in northeast Michigan were found to be harboring *Mycobacterium bovis*, the causative agent of tuberculosis in most animals including humans. Although deer likely contracted tuberculosis from cattle in the early 20th century, when the disease was still present in Michigan cattle, today the disease is spilling back from deer to cattle. Efforts have been made to decrease disease prevalence in deer in that region. One possible tool for decreasing prevalence would be to decrease disease transmission through vaccination of free-ranging deer.

The human tuberculosis vaccine *M. bovis* BCG has been used in humans since 1920. Although a live vaccine, BCG is non-pathogenic for humans; however, exposure in humans, may interfere with tuberculin skin testing resulting in false positive results. In experimentally infected deer, BCG vaccination decreases disease severity in both oral and subcutaneously vaccinated deer. As venison is often consumed by hunters, it is important to recognize potential public health issues resulting from the possible exposure to BCG remaining in tissues of vaccinated deer. BCG persisted for 3 months and 9 months in deer vaccinated orally or subcutaneously, respectively. However, persistence occurred only in lymphoid organs, not likely to be consumed by hunters. At no time was BCG detected in meat.

Vaccinated deer shed BCG vaccine for an undetermined time after vaccination. Non-vaccinated pen mates can be exposed to BCG and in some cases BCG can be found in organs and tissues of non-vaccinated deer housed with vaccinated deer. Vaccine shedding to other species, such as cattle, could confound tuberculosis tesing in cattle, creating false positive results. It was demonstrated that BCG vaccinated deer shed vaccine to pen mates in close contact, but did not shed vaccine to cattle that were exposed to deer indirectly through shared feed.

Mycobacterium bovis BCG is likely to be a safe and efficacious vaccine for free-ranging white-tailed deer. More work is needed to establish levels of protection, explore delivery methods, and ensure safety.

Tuberculosis Testing under the Animal Welfare Act (AWA)

Chester Gipson, USDA-APHIS-Animal Care

Initial guidelines for control of tuberculosis (TB) in elephants were initially developed in 1998, with revisions in 2000, 2003, and 2008. TB testing is administered by USDA under the Animal Welfare Act-Policy 21, based on adequate veterinary care. Clarifications of the guidelines: APHIS has *never* recommended or required actions not specified in the Guidelines; APHIS has *never* required treatment – either based on positive culture results or positive MAPIA results (the Guidelines provide for a no-treatment option and/or euthanasia); all treatment decisions are the responsibility of the attending veterinarian. APHIS can recommend specialist to aid the attending veterinarian.

Restrictions on Elephant STAT-PAK use based on test kit license restrictions. These are the test must be run by a veterinarian and only approved laboratories can purchase and use the test kits. The rationale for the restrictions is that the screening test that can be used in Veterinary Services program animals, such as cattle; there is potential for fraudulent use in program animals; therefore test restricted to laboratory use. Federal oversight of testing is based on multiple factors. It ensures chain of custody and proper identification of animal to prevent fraudulent test results. Currently there is not a fraudulent blood testing program for elephants. Licensing restrictions of the test kit requires testing at NVSL (only facility approved to use the test kits at this time in US). Certified Federal veterinarians meet the intent of the licensing conditions for the test kit. Foreign lab testing requires Endangered Species Act export permits to ship samples.

Current procedures for testing:

1) Testing VMO with assistance as needed from home inspector contacts licensee to schedule test
2) Information is given to licensee regarding supplies needed and information for attending veterinarian
3) Licensee orders test kits from Chembio
4) Chembio notifies State Veterinarian that test kits will be used in their State (some State Veterinarians have signed a one year blanket approval for this and don't need to be notified each time; States have list of approved buyers/users of test in their State)
5) Test kits sent to testing VMO
6) Testing VMO identifies elephants with photographs, observes blood draws
7) Test is run on site or if licensee prefers, serum is sent to NVSL for completion of test
8) Reactive tests photographed
9) If Stat-Pak reactive, serum packaged for shipment to Chembio for MAPIA testing (contact information for licensee/attending veterinarian included in shipment.)
10) Results completed on site and copy left with licensee/attending veterinarian
11) Chembio sends test results to licensee
12) When MAPIA testing is complete at Chembio and licensee has been notified by them, testing VMO completes field form and delivers to licensee/attending veterinarian
13) Final test report forms sent to Field Specialist for Elephants

Based on the official testing started in 2010, as of November 1, 2010, there were 455 elephants in the National Herd. 217 elephants have been tested; 19 elephants have not been tested at the same facilities (due to age, handling issues, etc.). 219 elephants have been scheduled to be tested between now and March 2011 (48%). Of those tested, 179 Stat-Pak non reactive (82%) and 38 Stat-Pak reactive (18%). Of the Stat-Pak reactive animals, 21 MAPIA were reactive and indicative of MTb (55%).

The testing program will run as presented throughout the first year (March 2010-March 2011). Accredited veterinarian at elephant facilities are eligible to undergo training for certification in the Stat-Pak test (unofficial use/testing only at this time). Training must be requested through Animal Care.

Disaster Plans for Facilities with Captive Wildlife, aka, Lions and Tigers and Bears, OH MY!

Kevin M. Dennison, USDA-APHIS-Animal Care, Western Coordinator, Emergency Programs
Yvonne Nadler, Lincoln Park Zoo, Chicago

Hurricane Katrina was a natural disaster that devastated the Gulf Coast in 2005. According to the National Hurricane Center, this storm is described as "one of the most devastating natural disasters" in U.S. history.

The emotional anguish and death toll in the human population from this storm has been well documented. Perhaps not as well known were the effects the storm had on animal populations. Thousands of animals died or were never returned to their owners.

Many lessons were learned by State and Federal agencies about emergency response planning and preparedness for animals from dealing with Katrina. A critical lesson learned was the fact that many facilities that manage wildlife had spent little time developing contingency plans that could be activated in a disaster. A proposed rule change to the Animal Welfare Act would now *require* licensed facilities to develop written contingency plans to assist them with preparedness, emergency management and recovery.

The Zoological Best Practices Working Group, (funded by United Stated Department of Agriculture Animal Care Emergency Programs), was created to develop tools that wildlife owners and managers can use to draft their own unique contingency plans. This presentation will discuss the process by which these tools are being developed, explore their contents, and explain how the tools will be disseminated for use by the wildlife and exotic animal community.

White-nose Syndrome in Bats

David Blehert, Jeff Lorch, Carol Meteyer, Anne Ballmann, and Scott Wright; USGS – National Wildlife Health Center

White-nose syndrome (WNS) is a disease associated with unprecedented bat mortality in the Eastern United States and Canada. Since the winter of 2006-2007, bat population declines approaching 100% have been documented at some surveyed hibernacula. Total estimated losses have exceeded one million bats over the past three years. Affected hibernating bats often present with visually striking white fungal growth on their muzzles, ears, and/or wing membranes. Histopathological and microbiological analyses demonstrated that WNS is characterized by a hallmark fungal skin lesion caused by a recently discovered species of psychrophilic (cold-loving) fungus, *Geomyces destructans*. The fungus grows optimally between 5°C and 14°C, temperatures consistent with core body and roosting site temperatures of hibernating cave bat species from temperate regions of North America. Laboratory infection trials indicated that *G. destructans* is transmissible bat-to-bat, and DNA from the fungus has been identified in environmental samples collected from several bat hibernation caves within WNS-infested states. There is a growing body of evidence supporting *G. destructans* as the cause of WNS, and this disease represents an unprecedented threat to bats of temperate regions of North America and beyond. Worldwide, bats play critical ecological roles in insect control, plant pollination, and seed dissemination, and the decline of North American bat populations may have far-reaching ecological consequences.

White-tailed Deer are Susceptible to Scrapie by Natural Route of Infection

Jodi D. Smith, Justin J. Greenlee, and Robert A. Kunkle; Virus and Prion Research Unit, National Animal Disease Center, USDA-ARS

Interspecies transmission studies afford the opportunity to better understand the potential host range and origins of prion diseases. Previous experiments demonstrated that white-tailed deer are susceptible to sheep-derived scrapie by intracranial inoculation. The purpose of this study was to determine susceptibility of white-tailed deer to scrapie after a natural route of exposure. Deer (n=5) were inoculated by concurrent oral (30 ml) and intranasal (1 ml) instillation of a 10% (wt/vol) brain homogenate derived from a sheep clinically affected with scrapie. Non-inoculated deer were maintained as negative controls. All deer were observed daily for clinical signs. Deer were euthanized and necropsied when neurologic disease was evident, and tissues were examined for abnormal prion protein (PrP^{Sc}) by immunohistochemistry (IHC) and western blot (WB). One animal was euthanized 15 months post-inoculation (MPI) due to an injury. At that time, examination of obex and lymphoid tissues by IHC was positive, but WB of obex and colliculus were negative. Remaining deer developed clinical signs of wasting and mental depression and were necropsied from 28 to 33 MPI. Tissues from these deer were positive for scrapie by IHC and WB. Tissues with PrP^{Sc} immunoreactivity included brain, tonsil, retropharyngeal and mesenteric lymph nodes, hemal node, Peyer's patches, and spleen. This work demonstrates for the first time that white-tailed deer are susceptible to sheep scrapie by potential natural routes of inoculation. In-depth analysis of tissues will be done to determine similarities between scrapie in deer after intracranial and oral/intranasal inoculation and chronic wasting disease resulting from similar routes of inoculation.

Chronic Wasting Disease National Program for Farmed and Captive Cervids Update

Patrice N. Klein; National Center for Animal Health Programs, USDA-APHIS-VS

In FY2010, APHIS received approximately $16.8 million in appropriated funding for the CWD Program, including $1.0 million in congressional earmarks. The FY2011 President's proposed budget for the CWD Program is $14.2 million (exclusive of any congressional earmarks). In the first quarter of FY2011, the federal government is operating on a Continuing Resolution based on a quarterly percentage of the FY10 budget.

CWD Rule Update: Public comments received on the proposed amendments to the 2006 CWD rule were categorized, reviewed, and responses were drafted. Issues that may impact the amended final rule and CWD Program implementation include the President's Memo on federal preemption (May 20, 2009), budgetary constraints, and ongoing need for additional research to better understand the science for prevention and control of CWD. A draft of the amended CWD final rule is in clearance in November 2010.

Surveillance testing: Through FY2009, VS conducted surveillance testing on more than 23,000 farmed and captive cervids by the immunohistochemistry (IHC) standard protocol. In FY2010, approximately 20,000 farmed and captive cervids were tested by IHC for CWD with funding to cover lab costs provided through NVSL.

Status: CWD was detected in one captive white-tailed deer (WTD) herd in Missouri in February 2010. To date, 50 farmed/captive cervid herds have been identified in 11 states: CO, KS, MI, MN, MO, MT, NE, NY, OK, SD, WI. Thirty-seven were elk herds and 13 were WTD herds. At this time, six CWD positive elk herds remain in Colorado and one WTD herd remains in MO. VS has continued to offer indemnity for appraised value of the animals and to cover costs of depopulation, disposal, and testing of CWD-positive and exposed herds. Indemnity is provided based on availability of federal funding.

Controlling Disease at the Fence: Research Questions, Answers, and on to More Questions

Kurt VerCauteren, National Wildlife Research Center, USDA-APHIS-WS

In recent years the National Wildlife Research Center has collaborated with many privately owned elk and deer producers to investigate many aspects regarding the potential for disease transmission between free-ranging and captive cervids. A suite of studies began with a fenceline-interaction evaluation designed to determine if and to what extent interactions occurred along perimeter fences. We found through 1 year of video monitoring that interactions between captive and free-ranging white-tailed deer (*Odocoileus virginianus*) were relatively rare (2 direct contacts and 7 indirect contacts). Interactions between captive and free-ranging elk (*Cervus elaphus*), though, were relatively common (77 direct contacts and 274 indirect contacts). To address this issue, we proceeded to design and evaluate a cost-effective baited-electric fence that could be added to an existing single perimeter fence to minimize potential interactions. Our case study documented that once exposed to the electric fence individual elk learned to respect it and were completely deterred thereafter. The ambiguous question of how high white-tailed deer can jump was next on our list of pursuits to further evaluate risk associated with perimeter fences. Following a controlled evaluation involving 43 white-tailed deer motivated to jump progressively higher fences, we determined that a 2.1-m-high fence presents a considerable barrier. We also teamed up with colleagues to develop the rectal biopsy antemortem test for identifying CWD-infected individuals, collecting over 1,500 rectal biopsies from captive cervids to date. We have incorporated the procedure into our research and continue to work toward assessing its utility relative to management. To prepare for instances when disease is introduced into the wild at a pointsource, we initiated a study evaluating rapid containment of white-tailed deer and demonstrated the efficacy of 2.1-m-high polypropylene mesh fence for emergency containment. A study we hope to do will document how captive white-tailed deer respond following "escape" from a captive deer facility. The study would give us an understanding of how easily these deer can be recaptured and how readily they integrate into the local free-ranging deer herd. The progression of research that we have conducted to date has provided insight into what occurs along perimeter fences at captive cervid facilities and is enabling producers and management agencies to make more informed decisions relative to protecting valuable resources inside and outside fences. We will briefly discuss these studies and more.

Committee Business

A resolution, “Funding for Evaluation of the Chembio Antibody Test as an Official Tuberculosis Program Test for Cervids,” was presented and passed by the Committee, and sent to the Committee on Nominations and Resolutions.