

COMMITTEE ON CAPTIVE WILDLIFE AND ALTERNATIVE LIVESTOCK

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The Committee met on October 2, 2011 at the Adams Mark Hotel in Buffalo, New York from 12:30-5:30 p.m. There were 25 members and 31 guests present. Dr. John Fischer presided as acting chair for the Committee due to unavoidable conflicts of Drs. Miller and Hilsenroth.

Bovine TB in a Farmed Herd of Elk and Fallow Deer

Suelee Robee-Austerman of the USDA-APHIS-NVSL reported on bovine tuberculosis in a farmed cervid herd. In 2009, *Mycobacterium bovis* infection was detected in a herd of 60 elk (*Cervus elaphus*) and 50 fallow deer (*Dama dama*) in Nebraska, USA. Upon depopulation of the herd, the prevalence of bovine tuberculosis (TB) was estimated at ~71–75%, based upon histopathology and culture results. Particularly with elk, gross lesions were often severe and extensive. One year earlier, the majority of the elk had been tested for TB by single cervical test (SCT), and all were negative. After initial detection of a tuberculous elk in this herd, 42 of the 59 elk were tested by SCT. Of the 42 SCT-tested elk, 28 were TB-infected with only 3/28 reacting upon SCT. After SCT, serum samples were collected from the infected elk and fallow deer from this herd at necropsy and tested by three antibody detection methods including multiantigen print immunoassay, cervidTB STAT-PAK, and dual path platform VetTB (DPP). Serologic test sensitivity ranged from 79 to 97% depending on the test format and host species. Together, these findings demonstrate the opportunities for use of serodiagnosis in the rapid detection of TB in elk and fallow deer

Best Practice Working Group on Zoological Contingency Planning

Kevin M. Dennison of USDA APHIS Animal Care updated the committee on the Zoological Best Practice Working Group activities. The Best Practice Working Group on Zoological Contingency Planning (ZBPWG) is a USDA APHIS cooperatively funded project managed by the Lincoln Park Zoo in Chicago, IL. Additional partners include the Association of Zoos and Aquariums, American Association of Zoo Veterinarians, the Global Federation of Animal Sanctuaries, State representatives, and many additional stakeholders. The project goal has been to develop a set of best practice guides on the various elements of emergency planning for a wide variety of zoological facilities including zoos, aquaria, sanctuaries, wildlife rehabilitation, exotic wildlife ranching, animal entertainment exhibitors, and more. Dr. Yvonne Nadler, a veterinary epidemiologist at the Lincoln Park Zoo head the project. The work of the ZBPWG has been completed and the work products are available at www.zoanimalhealthnetwork.org. The work products include the following:

- Risk Assessment Annex
- Administration Annex

- Animal Incident Annex
- Business Recovery Annex
- MOU and MAA Annex
- Criminal Incident Annex
- Training/Exercise Annex
- Lessons Learned
- Data Annex
- Emergency Animal Care Annex
- Facilities Annex
- Emergency transportation Annex
- Planning Roadmap

Zoological facilities offer unique challenges in the face of disasters. 2011 became an extraordinarily active year for the management of emergencies impacting zoological facilities.

Complete evacuation:

- Dakota Zoo, Bismarck, ND (temporary)
- Roosevelt Park Zoo, Minot, ND (long-term with major damage)

Partial evacuation:

- Riverside Zoo, North Platte, NE
- Zoo America, Hershey, PA

Key issues:

- Planning is the key to successful evacuation secondary to forecast flooding.
- Working with local emergency management and mutual aid from peer organizations regionally and nationally is critical.
- Many zoological facilities are eligible for Federal response and recovery cost-share grants (FEMA Public Assistance Grant program), but appropriate documentation of actions and expenses are critical.
- Stakeholder organizations can be extremely valuable partners for both mutual aid and sharing of experiences from previous disasters.

Regulatory emergencies:

- USDA presented with fiscal collapse of a major wildlife sanctuary in TX with over 330 captive wild animals including chimpanzees, baboons macaque and other monkeys, lemurs, lions, tigers, bears, leopards, cougars, wolves, and more.
- USDA partnered with the Texas Attorney General, International Fund for Animal Welfare, Global Federation of Animal Sanctuaries, and many individual organizations to help provide resources and assistance until the animals could be voluntarily relocated. Current status is all animals except macaques are out and the macaques will be leaving soon for a new facility. No animal unnecessary euthanasia of animals was performed (1 geriatric tiger was euthanized for medical reasons during this period.)
- Many of the partnerships and principles of emergency management were applied to the situation to achieve a positive outcome for all concerned.

Update on proposed regulation under the Animal Welfare Act on contingency planning for regulated facilities:

- A proposed rule has passed through a period of public comment and is in final review in the Federal system.
- The rule would require all facilities regulated under the Animal Welfare Act to develop contingency plans (emergency plans) that would:
 - Identify likely risks
 - Identify chain of command and key actions
 - Identify resources needed

- Train staff in the plan
- Timeline for final approval or disapproval is uncertain

Serodiagnosis of Tuberculosis in Camelid Species

Konstantin Lyashchenko of Chembio Diagnostic Systems, Inc. provided a presentation on serodiagnosis of tuberculosis. Tuberculosis (TB) in South American camelids (SAC) is caused by *Mycobacterium bovis* or *Mycobacterium microti*. Three serological methods, Rapid Test (RT), Dual Path Platform (DPP), and Multiantigen Print Immunoassay (MAPIA), were evaluated on naturally infected SAC. The study population included 156 alpacas and 175 llamas from Great Britain, Switzerland, and the United States. TB due to *M. bovis* (n=44) or *M. microti* (n=8) was diagnosed by gross pathology examination and culture in 35 alpacas and 17 llamas. Control animals were from herds with no TB history. In alpacas, RT and DPP showed sensitivity of 71% and 74%, respectively, while in llamas it was 77% for both assays. Diagnostic specificity was higher for DPP (98%) if compared to RT (94%) in llamas and similar for the two assays in alpacas (98%). When the two antibody tests were combined, the parallel testing interpretation (either assay is reactive for a positive result) enhanced the sensitivity of antibody detection to 89% in alpacas and 88% in llamas, but at the expense of lower specificity (97% and 93%, respectively), whereas the serial testing interpretation (both assays must be reactive for a positive result) maximized the specificity to 100% in both SAC species, although the sensitivity was 57% for alpacas and 65% for llamas. Most of the animals with evidence of TB failed to produce skin test reactions, thus confirming concerns about the validity of this method in SAC. The findings suggest that serological assays may offer a more accurate and practical alternative for ante-mortem detection of camelid TB.

Activities of USDA-APHIS Animal Care

Nora Wineland of the USDA-APHIS-Animal Care's Center for Animal Welfare provided an update on proposed and planned rules of interest to the committee. The contingency plan final rule is expected out soon, as is a final rule regarding itineraries. The proposed rule for rats, mice, and birds remains under development. Recent OIG audits have resulted in some changes that were discussed. Specifically, safety concerns have resulted in efforts to review and adjust as needed how barriers and enclosures for dangerous animals are viewed by the agency. These reviews are still under way. The problematic dog dealer audit has resulted in some changes as well especially when it comes to consistency of inspections and approaches to enforcement. The current fiscal situation makes this a continued work in progress. In March of 2011 a publicly available search function for inspection reports was launched in support of the current government wide efforts toward transparency. The emergency management area of APHIS Animal Care has been engaged in a couple of areas of note to the captive wildlife community: work with the Zoo Animal Health Network (ZAHN) and the Zoo Best Practices Working Group (ZBPWG). ZAHN has been active in HPAI surveillance, outbreak management (planning) and development of online training, while the ZBPWG has created a document library which is available on the ZAHN website (www.zooanimalhealthnetwork.org).

USDA-APHIS-VS Chronic Wasting Disease National Program

Patrice N. Klein of USDA APHIS VS – National Center for Animal Health Programs provided an update on the agency's CWD-related activities:

CWD Rule Update: The amended final rule on chronic wasting disease (CWD) is currently in departmental clearance. The rule will set minimum standards for interstate movement and establish the national voluntary Herd Certification Program (HCP).

Farmed/captive cervid surveillance testing: Through FY2010, VS conducted surveillance testing on approximately 20,000 farmed /captive cervids by the immunohistochemistry (IHC) standard protocol. As of September 15, 2011, approximately 19,000 farmed /captive cervids were tested by IHC for CWD with funding to cover lab costs provided through NVSL.

Farmed/captive cervid CWD status: The CWD positive captive white-tailed deer (WTD) herd reported in Missouri (February 2010) was indemnified and depopulation activities were completed in June 2011. All depopulated animals were tested for CWD and no additional CWD positive animals were found.

In FY 2011, CWD was reported in two captive elk herds in Nebraska (December, 2010 and April 2011, respectively). To date, 52 farmed/captive cervid herds have been identified in 11 states: CO, KS, MI, MN, MO, MT, NE, NY, OK, SD, WI. Thirty-nine were elk herds and 13 were WTD herds. At this time, eight CWD positive herds remain – six elk herds in Colorado and the two elk herds in Nebraska.

Wild Cervid surveillance: In FY 2009 funding supported surveillance in approximately 74,330 wild cervids in 47 cooperating States. Wild cervid CWD surveillance totals are pending for fiscal year 2010 (2010 – 2011 calendar year) due to seasonal surveillance activities and completion of final cooperative agreement reporting to APHIS.

In fiscal year 2011, there are 15 'tier 1' States, 20 'tier 2' States, and 15 'tier 3' States. Two new 'tier 1' States, Minnesota and Maryland, were added in fiscal year 2011 based on the new CWD detections in a free-ranging white-tailed deer in southeastern Minnesota and in western Maryland. Consequently, Delaware was upgraded to 'tier 2' status as an adjacent State to Maryland. For FY 2011, 45 States and 32 Tribes will receive cooperative agreement funds to complete wild cervid surveillance and other approved work plan activities. Based on FY 2012 projected budget reductions, future cooperative agreement funds will be eliminated.

APHIS CWD Funding: In FY2011, APHIS received approximately \$15.8 million in appropriated funding for the CWD Program. The President's FY 2012 budget proposes to reduce program funding for CWD by \$13.9 million, leaving the program with a request of \$1.925 million to provide some level of Federal coordination for the national herd certification program (HCP).

Consequently, APHIS is planning to amend its role in the program to one of Federal coordination. Based on the projected FY 2012 budget, funding for CWD cooperative agreements and indemnity funding for States and Tribes will be eliminated. Under this scenario, the States or cervid industry producers will likely be responsible for the costs of surveillance testing and indemnity for appraisal, depopulation, and disposal of CWD-positive animals.

Commodity Health Line Structure: In the FY 2012 budget, livestock commodities regulated by USDA have been organized into 'Commodity Health Line' structures or groupings. APHIS' Equine, Cervid and Small Ruminant (ECSR) Health line supports efforts to protect the health and thereby improve the quality and productivity of the equine, cervid and small ruminant industries. Activities supported by the ECSR Health line range from monitoring and surveillance to investigation and response actions undertaken when health issues relevant to the industry are identified. APHIS also maintains regulations and program standards which guide ECSR activities at both the Federal and State/Tribal level.

The ECSR Health line funds essential activities necessary to maintain current ECSR surveillance and program operations while providing the flexibility to respond to new and emerging industry-specific health concerns. APHIS' current activities include Scrapie, Chronic Wasting Disease (CWD), Slaughter Horse Transport, and Brucellosis/Tuberculosis in cervids. Overall, APHIS will use funding from the ECSR Health Line Item to support Agency efforts in the following mission areas: prevention, preparedness and communication; monitoring, surveillance and detection; response and containment; and continuity of business, mitigation and recovery

Scrapie in Deer: Comparisons and Contrasts to Chronic Wasting Disease (CWD)

Justin J. Greenlee of the Virus and Prion Diseases Research Unit, National Animal Disease Center, ARS, USDA, Ames, IA provided a presentation on scrapie and CWD in inoculated deer. Interspecies transmission studies afford the opportunity to better understand the potential host range and origins of prion diseases. We inoculated white-tailed deer intracranially (IC) and by a natural route of exposure (concurrent oral and intranasal inoculation) with a US scrapie isolate. All deer inoculated by the intracranial route had evidence of PrP^{Sc} accumulation and those necropsied after 20 months post-inoculation (PI) (3/5) had clinical signs, spongiform encephalopathy, and widespread distribution of PrP^{Sc} in neural and lymphoid tissues. A single deer that was necropsied at 15.6 months PI did not have clinical signs, but had widespread distribution of PrP^{Sc}. This highlights the facts that 1) prior to the onset of clinical signs PrP^{Sc} is widely distributed in the CNS and lymphoid tissues and 2) currently used diagnostic methods are sufficient to detect PrP^{Sc} prior to the onset of clinical signs. The results of this study suggest that there are many similarities in the manifestation of CWD and scrapie in white-tailed deer after IC inoculation including early and widespread presence of PrP^{Sc} in lymphoid tissues, clinical signs of depression and weight loss progressing to wasting, and an incubation time of 21-23 months. Moreover, western blots (WB) done on brain material from the obex region have a molecular profile consistent with CWD and distinct from tissues of the cerebrum or the scrapie inoculum. However, results of microscopic and IHC examination indicate that there are differences between the lesions expected in CWD and those that occur in deer with scrapie: amyloid plaques were not noted in any sections of brain examined from these deer and the pattern of immunoreactivity by IHC was diffuse rather than plaque-like. After a natural route of exposure, 100% of white-tailed deer were susceptible to scrapie. Deer developed clinical signs of

wasting and mental depression and were necropsied from 28 to 33 months PI. 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. While two WB patterns have been detected in brain regions of deer inoculated by the natural route, unlike the IC inoculated deer, the pattern similar to the scrapie inoculum predominates.

Committee Business:

The Committee discussed and approved three resolutions regarding CWD. They can be found in the report of the Resolutions Committee. Essentially the resolutions urged USDA-APHIS-VS to:

Continue to provide funding for CWD testing of captive cervids

- Finalize and publish the national CWD rule for Herd Certification and Interstate Movement
- Evaluate live animal test, including rectal mucosal biopsy, for CWD in cervids