

REPORT OF THE COMMITTEE ON PUBLIC HEALTH AND RABIES

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Vice Chair: Nancy Frank, MI

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The Committee met on October 21, 2014 at the Sheraton Hotel in Kansas City, Missouri, from 1:00 pm to 5:30 pm. There were 24 members and 29 guests present. Dr. Norman welcomed members and guests and provided introductory comments. The published agenda was modified to accommodate an update on Ebola virus

Presentations & Reports

Ebola Virus Update

Casey Barton-Behravesh, MS, DVM, DrPH, DACVPM
Centers for Disease Control and Prevention

Dr. Barton-Behravesh's presentation was via telephone. She reviewed the current situation of Ebola virus in West Africa and in the United States. There is a collaborative effort between Centers for Disease Control and Prevention (CDC), United States Department of Agriculture (USDA), and the American Veterinary Medical Association (AVMA) to develop guidelines for handling animals that may be exposed to Ebola virus. Four work groups have been established. These are Companion Animal, Livestock, Zoos, and Personal Protective Equipment. Dr. Barton-Behravesh indicated that testing for animals is not readily available at this time. Any testing needs prior authorization by CDC. At this time, it is not thought that pets are at risk for Ebola virus in the United States.

Evaluation of Current Rabies Exposure Policies: Comparing the anamnestic responses in currently vaccinated vs. out-of-date dogs and cats

Mike Moore, DVM, MPH
Rabies Laboratory, Kansas State University

The disposition of vaccinated dogs and cats exposed or potentially exposed to rabies varies significantly depending on the temporal status of their rabies vaccination history. The *Compendium of Animal Rabies Prevention and Control* recommends a rabies booster and a 45 day observation period for dogs and cats that are currently vaccinated. Dogs and cats that are not vaccinated are euthanized or placed in strict isolation for 6 months. We believe both of these recommendations are sound scientific approaches. The challenging cases are the dogs and cats that are overdue for a booster. These animals are usually relegated to the euthanize or 6 month quarantine category. Many times this is done out of fear for public safety or interpretation of (laws) written by non-scientists. We compare the anamnestic responses of

current and overdue dogs and make a case for the change in the disposition of overdue dogs and cats to mirror that of current animals.

The Global Economic Burden of Rabies

Stephanie A. Shwiff and Aaron Anderson

¹National Wildlife Research Center, USDA APHIS Wildlife Services, 4101 LaPorte Avenue, Fort Collins, CO, United States of America 80521

Although canine rabies has been eliminated from industrialized countries, infected dogs remain the primary source of human and livestock exposures in Asia, Africa and much of South America. Human deaths are the most important direct economic impact of canine rabies, followed by livestock losses and the cost of PEP, while expenses associated with dog vaccination and control are major indirect impacts. The global burden of rabies disproportionately affects Asia, which experiences more than half of human rabies deaths and approximately 65% of livestock losses, and performs more than 90% of postexposure prophylaxis (PEP). Africa is second to Asia in terms of human deaths and livestock losses, but administers the least number of PEPs of the three regions. Recent experience in Latin America shows that efforts to reduce human deaths from rabies through expanded dog vaccination and improved access to PEP result in significant monetary savings. The elimination of canine rabies would lead to major economic benefits in developing countries that are often the least capable of dealing with the disease.

***Campylobacter jejuni* Infections Associated with Raccoon Contact at a Wildlife Rehabilitation Center**

Saunders, Samantha¹; Smith, Kirk²; Schott, Renee³; Scheftel, Joni²

¹CDC/CSTE Applied Epidemiology Fellow at the Minnesota Department of Health, Acute Disease Investigation and Control Section, Saint Paul, MN; ² Minnesota Department of Health, Acute Disease Investigation and Control Section, Saint Paul, MN; ³The Wildlife Rehabilitation Center, Roseville, MN

Background: In September 2013, the Minnesota Department of Health identified two *Campylobacter jejuni* cases who reported volunteering at the same wildlife rehabilitation center (WRC). The cases' isolates were indistinguishable by pulsed-field gel electrophoresis (PFGE). An investigation was initiated to determine whether there was an association between volunteering at the WRC and illness.

Methods: A case-control study design was used. Cases were defined as people who volunteered at the WRC during July-September 2013 and experienced fever and diarrhea, or diarrhea lasting ≥ 3 days, within 1 week of working at the WRC. Controls were defined as individuals who had volunteered at the WRC during July-September 2013. Cases and controls were interviewed about animal species handled, tasks performed, use of personal protective equipment (PPE), disease training, eating and drinking habits at the WRC, and handwashing. Pooled animal fecal samples were collected from six different animal locations: avian nursery, waterfowl nursery, laundry room, raccoon nursery, squirrel nursery, and rabbit room.

Results: Of the 184 individuals enrolled, 18 (10%) met the case definition. In univariate analyses, contact with multiple animal species was significantly associated with illness. In a multivariate model, only direct contact with raccoons was independently associated with illness (adjusted odds ratio [aOR], 12.2; 95% confidence interval [CI], 1.84-80.1; $p=0.001$). Both pooled juvenile raccoon samples tested positive for *Campylobacter jejuni*; all other pooled animal fecal samples were negative for *Campylobacter*. The PFGE pattern of isolates from raccoons was indistinguishable from that of the two index case isolates.

Conclusions: This was an outbreak of *Campylobacter jejuni* infections associated with raccoon contact among volunteers/staff at a wildlife rehabilitation center. Raccoons were identified as the source of infection through a case-control study and through isolation of the outbreak strain of *Campylobacter jejuni* from raccoon feces. Increased infection control measures were recommended, and the importance of PPE usage and handwashing were stressed.

United States Department of Agriculture (USDA)/Animal and Plant Health Inspection Service (APHIS) /Wildlife Services (WS) Rabies Update

Richard Chipman

National Rabies Management Coordinator

USDA, APHIS, Wildlife Services

An overview of the National Rabies Management Program (NRMP) was provided by Richard Chipman, Rabies Management Coordinator for USDA, APHIS, Wildlife Services. In FY14, APHIS distributed >8.1 million oral rabies vaccination (ORV) baits over 163,000 km² (an area almost the size of Wisconsin) in 15 states: Alabama, Florida, Georgia, Maine, Massachusetts, New Hampshire, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Texas, Vermont, Virginia, and West Virginia. Bait distribution included Raboral V-RG® and ONRAB vaccines that prevented raccoon rabies from spreading beyond the eastern US and canine rabies from reemerging in Texas. These efforts included the distribution of 233,100 ORV baits in Concho County, Texas during a continued contingency action surrounding the first case of Texas gray fox (TXGF) variant in the US since May 2009 (which occurred in May 2013). This effort helped prevent the spread of rabies beyond this one case. In addition, the NRMP is supporting (GIS, logistics) a skunk ORV trial west of Houston being conducted by the Texas Department of State Health Services (TDSHS). In January, >1.2 million Raboral V-RG® coated sachet baits were distributed by WS helicopter at varying bait densities (25, 58 and 116 baits/km²) targeting skunks in Texas. In cooperation with the Centers for Disease Control and Prevention (CDC) and state agricultural, health, and fish and wildlife agencies, the NRMP continued to expand use of the direct rapid immunohistochemical test (dRIT), a rapid diagnostic test that can confirm rabies in 50 minutes in the field, allowing for sound decisions in real-time based on the best available rabies surveillance data. To date, WS has sent 66 personnel from 20 states for dRIT training and certification at the CDC. From 2005 through October 15, 2014, WS collected 80,821 animals (from 27 states) to enhance rabies surveillance. Of those, WS tested 66,993 samples (from 23 states) using the dRIT, while the remaining animals were submitted to local public health laboratories or the CDC; 1,248 of the dRIT tested animals were confirmed rabid. Following a field trial conducted by APHIS in West Virginia in 2011 using ONRAB (a recombinant oral rabies vaccine that uses a human adenovirus5 as the virus vector to express the rabies glycoprotein), the trial was replicated in West Virginia and expanded to New York/Vermont/ New Hampshire and Ohio in FY12. Due to unusual laboratory results, blood samples from Ohio and West Virginia collected in 2012 are being retested. Preliminary results showed rabies antibody levels in the NY/VT/NH field trial were substantially higher post-ORV (66.1%) than prior to ONRAB baiting (29.5%) in 2012. In FY13, ONRAB trials were repeated again in New York/Vermont/New Hampshire, Ohio and West Virginia with expansion in northeastern NY by APHIS as well as a Cornell-led field trial in the vicinity of Buffalo, NY. Serology results are pending for all of the APHIS trial states except for Vermont. Preliminary results continue to be promising with 58.4% of the pre-bait samples showing antibodies and 68.1% showing antibodies after baiting. The high antibody level prior to baiting is likely because 20% of the animals captured during the pre-bait interval in 2013 were recaptures from 2012, so had potentially been exposed to bait before. In FY14, the NY/VT/NH and Ohio trials were again repeated, while in West Virginia ONRAB baiting was done at 300 baits/km² targeting skunks (rather than 75 baits/km² for raccoons as in FY11-FY13). Nearly 1.7 million ONRAB baits were distributed in the 5 states. Pre-ONRAB trapping in all states took place from June 23-August 15 and >2,600 raccoons were captured and sampled prior to FY14 ONRAB ORV distribution. Post-ONRAB trapping took place in all states from September 23-October 17 and more than 1,800 raccoons were sampled. All FY14 results are pending from laboratories.

Knowledge Gaps Limit Application of ORV to Emerging Skunk Rabies Concerns in the United States

Emily W. Lankau, DVM, PhD and Joanne Maki, DVM, PhD

Merial

Oral rabies vaccine (ORV) filled baits have been successfully applied to reducing rabies virus transmission in US wildlife populations, including coyotes, gray foxes, and raccoons. However, control of rabies in striped skunks (*Mephitis mephitis*) with ORV has proved a more challenging prospect, despite

laboratory evidence that available oral vaccines are immunogenic in skunks. Effective delivery of ORV to skunks in the field setting has proved more difficult than other reservoir species, presumptively due to differences in the biology, behavior, and ecology of this species. In this presentation, we review skunk rabies epidemiology in the United States and highlight regions with established and emerging skunk rabies concerns. Next we will review laboratory and field evidence of RABORAL V-RG efficacy in skunks, including a recent bait density trial performed in Texas. Finally, we will discuss why skunks remain a difficult species to reach with ORV baits and will outline future research needs to address gaps in understanding of skunk ecology and bait consumption that may improve capacity to use ORV for controlling rabies virus circulation in this species.

USDA-APHIS One Health Coordination Center Update

Tracey Lynn, DVM, MS, DACVPM
USDA, APHIS, Veterinary Services
One Health Coordination Center

Dr. Tracey Lynn provided an update on One Health activities in the USDA-APHIS One Health Coordination Center. She provided a brief overview of the 5 VS One Health Priority Areas: Zoonotic Disease Engagement, Antimicrobial Resistance, PreHarvest Food Safety, Pandemic Preparedness and Response, and Global Health Security. She provided an in-depth look at one key project designed to foster greater cross-agency collaborations – the One Health Systems Mapping and Analysis Resource Toolkit. OH-SMART consists of a series of 6 steps that stakeholder organizations work through together. The method guides participants through activities to gain a better understanding of what drives One Health collaborations, and allows cross-agency networks to create a shared understanding of the One Health system. Using an interactive mapping process, participants build consensus on best practices and standardized operating procedures for current and future cross-sectoral work and collaboration in their state or country. The OHCC is seeing a number of positive outcomes from the OH-SMART training workshops, including development of cross-sectoral action plans, workforce development and training, and identification and implementation of best practices. Several states have used the method to strengthen outbreak and all-hazards incident response plans. OH-SMART is a valuable tool to analyze the interactions and connections between sectors, and is useful to augment - not replace - other systems analysis tools or workforce assessments, including the OIE PVS tool. OHCC believes the OH-SMART workshops are a valuable way to advance the Global Health Security agenda. The OHCC is actively working to get the method included in the Global Health Security implementation plans. The next OH-SMART training workshop will be May 19-21 in Minneapolis MN.

25 Year Anniversary Review: Raboral V-RG

Dr. Joanne Maki, DVM, PhD and Dr. Emily Lankau DVM, PhD
Merial

Sanofi-Pasteur and Merial are One Health leaders in the global fight against rabies. As a veterinary vaccine manufacturer, Merial has a 25 year history of working with private and public partners to control wildlife rabies using an orally-delivered vaccinia-vectored rabies vaccine. After a successful application of this vaccine in Europe to control rabies in red foxes, RABORAL V-RG® was chosen to be developed as the first licensed wildlife oral rabies vaccine in North America. After pivotal studies conducted on Paramore Island, VA, the first oral rabies vaccination (ORV) program in the United States was initiated on Cape May, New Jersey during 1992. Additional raccoon rabies control programs followed at the federal, state, and county levels. Coordinated ORV programs proved successful in establishing a barrier against the western spread of raccoon rabies beyond the Appalachian Mountains. Smaller programs reduced prevalence of raccoon rabies in vaccinated zones and local elimination of virus circulation was achieved. Programs using RABORAL V-RG® have led to regional elimination of rabies from Texas coyote populations and near elimination of the Texas gray foxes variant in the United States. Internationally, the vaccine has aided rabies control efforts in multiple species, including foxes in Canada and Israel,

raccoons in Canada, and raccoon dogs in South Korea. After 25 years in the global market, RABORAL V-RG has repeatedly been shown to be a cost-effective component of rabies prevention. Even so, many challenges to effective wildlife rabies control in the US and internationally remain, including: an improved understanding of key program parameters which will lead to regional rabies elimination in North American raccoon and skunk populations, emerging rabies cases in hard-to-reach species such as skunks and ferret badgers, and the long-term battle to garner stable financial and political support for ORV programs after cases decline due to successful ORV programs. Both strong partnership and rigorous science will be required from the rabies community to address these challenges.

Coxiella burnetti and Zoonotic Infectious Diseases in Arctic Wildlife

Robert Gerlach, VMD
State Veterinarian, Alaska
Department of Environmental Conservation

Diagnosis of *Coxiella burnetti* and *Brucella* spp. in the Northern Fur Seals on the remote Native village of St. Paul resulted in a public health concern for the residents who rely on these animals as part of their subsistence diet. The Northern Fur Seal population has been declining over the last 40 years as a result of reduced birthing rate. The identification of a number of zoonotic pathogens in the seals by wildlife biologist resulted in a collaborative effort among state and federal public health and animal health agencies to address the risk of infection to the village residents. This one health investigation involved active surveillance in the community health clinic, evaluating archive and contemporary serum samples of the residents and further testing of animal and environmental samples. Results illustrated that the public health risk for contracting brucellosis or Q Fever from the consumption of northern fur seals is low.

Committee Business:

The committee passed a resolution requesting an increase in funding for the USDA APHIS WS oral rabies vaccination program. That resolution was forwarded to the Committee on Nominations and Resolutions for review. Don Hoenig presented the resolution in the absence of Don Lein who was unable to make it due to illness. Dr Norman asked committee members to think of him and send best wishes to him. The resolution was passed at the break as several committee members has to leave.

Dr Norman and Dr Frank thanked committee members for their participation and told them how much they enjoyed their tenure with the committee. Names of committee members who expressed interest in the chairmanship had their names forwarded to the President for consideration. He will appoint the next committee chair.

With no further business before the committee, it was voted to adjourn at 5:30 pm