The Committee met on October 22, 2013 at the Town and Country Hotel, San Diego, California, from 1:00-5:00 p.m. There were 28 members and 24 guests present. The purpose of the committee was reviewed. Resolution 27 from 2012 was reviewed. This Resolution was accepted by USAHA. The USDA response was that funding for oral rabies vaccination programs is expected to remain the same for FY 2014.

Presentations & Reports

What's New in the National Veterinary Stockpile?
Lee M. Myers, DVM, MPH, Dipl. ACVPM, MEP
USDA-APHIS-Veterinary Services (VS)

The mission of the USDA-APHIS-VS, National Veterinary Stockpile (NVS) program is to provide veterinary countermeasures – supplies, equipment, vaccines, and response support services – that States, Tribes, and Territories need to respond to damaging animal disease outbreaks. The NVS program’s two goals are to (1) within 24 hours, deploy countermeasures against the most damaging animal diseases, and (2) assist States, Tribes, and Territories with their planning, training, and exercises for the rapid acquisition, receipt, processing, and distribution of NVS countermeasures during an event.

Dr. Myers first emphasized that the NVS program is not expected to change significantly as a result of the APHISVS reorganization, which becomes effective in early November, 2013. The NVS program will become a part of the VS Surveillance, Preparedness, and Response Services' Logistics Center and remain under the direction of the current NVS Director.

APHIS-VS issued a fact sheet in July 2013 for high-consequence foreign animal diseases and pests. The list divides diseases and pests into tiers according to risk level and identifies biological threats that need to be considered in program priorities and countermeasure stockpile requirements. Tier 1 diseases are those of national concern that pose the most significant threat to animal agriculture in the United States, as they have the highest risks and consequences. The Tier 1 diseases important to the NVS include African swine fever (ASF), classical swine fever (CSF), foot-and-mouth disease (FMD), avian influenza (AI) (any strain that is highly pathogenic or has zoonotic significance), and virulent Newcastle disease (ND). Tier 2 diseases are transmitted primarily by pests. The Tier 2 diseases important to the NVS include Rift Valley fever (RVF) and Venezuelan equine encephalitis (VEE). Tier 3 diseases and pests pose less risk and fewer consequences than those in Tiers 1 and 2, but still rise to the level of inclusion because of their potential negative impact on animal or human health. Tier 3 diseases important to the NVS include henipaviruses (hendra and nipah), rinderpest, and peste des petits ruminants.

Dr. Myers then discussed and illustrated photographs of recently acquired countermeasures within the NVS. New countermeasures support cold chain management, animal handling, and emergency transport. Dr. Myers also emphasized that NVS contractors are receiving hands-on, field training to enhance capabilities for response support services. She highlighted the future NVS exercise partners and
reviewed the status of State, Tribe, and Territory NVS planning. NVS preparedness is a continuous cycle of planning, organizing, equipping, training, exercising, and evaluating. NVS planners are encouraged to use the NVS website www.nvs.aphis.usda.gov and the password-protected pages to download examples of state NVS plans, planning tools, questions and answers, and exercise after action reports.

**H3N2 Update: 2013 vs. 2012**

Bret D. Marsh, DVM  
Indiana State Veterinarian, Indiana State Board of Animal Health

During 2012, Indiana saw the highest rates of H3N2v virus infection in humans. An epidemiologic investigation of the 138 human cases found a strong correlation with contact with exhibition swine, primarily at county fairs.

To address this public health issue, the Indiana State Board of Animal Health (BOAH) worked closely with federal, state and county health officials, Purdue Extension and 4-H, and private veterinary practitioners, as well as the swine industry. Ultimately, the Indiana Swine Health Advisory Committee established a set of four recommendations for the 2013 to reduce the risk of another influenza event.

The four key recommendations were:
1. Vaccinate swine, whenever possible.
2. Shorten the amount of time swine are congregated at show sites (with a goal of less than 72 hours).
3. Monitor swine for signs of flu-like illness before and during the exhibition.
4. Change human behaviors in the barns, such as banning eating and cooking in animal areas and advising visitors to wash their hands.

As a follow-up to this initiative, BOAH hosted a national working group to develop guidelines for swine exhibitions nationwide. Those may be found online at: [http://nasphv.org/Documents/NASAHO-NASPHV-InfluenzaTransmissionAtSwineExhibitions2013.pdf](http://nasphv.org/Documents/NASAHO-NASPHV-InfluenzaTransmissionAtSwineExhibitions2013.pdf)

Remarkably, 2013 proved to be a very different year from 2012. By the end of the show season, the number of human cases was 14. This came as a surprise, considering the first 2013 human case was identified on June 21, during the state’s first county fair—much earlier than the initial 2012 case in mid-July. While this early case provided an expectation for a year with many cases, the summer did not pan out that way.

What factors played into dramatically fewer cases? Were the exhibition recommendations effective? Did advisories/warnings to the public work? Was it extensive media coverage? Or did the weather play a role? (The 2012 season was very hot and dry, compared to 2013.)

BOAH partnered with The Ohio State University(OSU) to test swine at the Indiana State Fair, as well as nearly 40 county fairs. Once those tests are processed, OSU researchers hope to provide a better picture of how widespread influenza viruses are in the exhibition sector.

**West Nile Virus (WNV) Outbreak Texas – 2012**

Tom J. Sidwa, DVM, MPH  
State Public Health Veterinarian, Texas

West Nile virus (WNV) is a single-stranded, positive sense RNA virus in the genus Flavivirus. It is a member of the Japanese encephalitis serogroup. This serogroup is the leading cause of arbovirus encephalitis in vertebrates. The virus was first isolated in the West Nile District of Uganda in 1937. Epizootics occurred in horses with significant mortality, but in humans the disease was generally asymptomatic or manifested as a self-limiting childhood disease. West Nile neuroinvasive disease (WNND) has been recognized since 1957, but remained infrequent until 1996 during an outbreak in Romania. Subsequent outbreaks were also marked by higher rates of central nervous system (CNS) disease and mortality. Virus that entered the U.S. in 1999 is thought to have been a strain from Israel. The Israeli and U.S. strains share the feature of high avian mortality and showed the greatest homology among strains compared at the time.

WNV is maintained in a sylvatic mosquito-bird-mosquito cycle. The virus can also infect a wide variety of incidental hosts, most notably humans and equines in which the spectrum of disease ranges from asymptomatic to fatal. Mosquito control and mosquito bite avoidance strategies are the only methods currently available for protecting human populations from infection. There are no known specific treatments or cures for the diseases caused by WNV, and vaccines for humans are not available.
The primary WNV vector mosquito in Texas is *Culex quinquefasciatus* (Southern House Mosquito). It ranges from the tropics to the lower latitudes of temperate regions (36N to 36S latitude). It is nighttime-active and an opportunistic feeder. St. Louis encephalitis virus, another Flavivirus that is reported in Texas, is also vectored by *Culex quinquefasciatus*. *Culex tarsalis* (Western Encephalitis Mosquito) is an important vector in the western portions of the state.

A wide variety of passerine birds develops viremia at levels necessary to serve as a virus source for biting vector mosquitos. The duration of viremia in birds is short and imparts lifetime immunity. The predominant species of birds that serve as a virus source for feeding mosquitos varies geographically. Members of the family *Corvidae*, e.g. crows, ravens, and blue jays experience high mortality from WNV infection. These mortality events may suggest that transmission of WNV is occurring in the area. Both humans and equines are considered "dead end host" due to low level viremia. However, transmission may occur from person to person, e.g. transplacentally and through organ transplantation.

WNV entered the U.S. in 1999 as evidenced by reports of human and avian cases. Approximately 80 percent of infected humans are asymptomatic. Approximately 20 percent develop West Nile fever (WNF), and <1 percent develop the more severe form of the disease, WNND. Sixty to 75 percent of WNND cases have encephalitis or meningoencephalitis. The remainder present with meningitis. The mortality rate for WNND is approximately 10 percent. Approximately 33% of clinically ill equines either die of the disease or are euthanatized because of it.

WNV reached Texas in 2002. Prior to the epidemic in 2012, case counts peaked in 2003 at 736 with 40 deaths. In 2012, there were 1,868 cases and 89 deaths affecting 134 of the state’s 254 counties. Texas reported 29 percent of the WNND cases in the U.S. that year. This was in stark contrast to 2011 in which there were 27 cases and two deaths. Reported equine cases peaked in 2002 with 1,699. Equine vaccine was licensed in 2003. The equine case count in 2012 was 120.

During the spring and early summer of 2012, the Texas Department of State Health Services (DSHS), along with local health department partners, performed routine surveillance and epidemiologic activities related to WNV. Vector control is the responsibility of local jurisdictions. However, local jurisdictions can request state support and assets if local capacity is exhausted.

Historically, WNV case onsets peak in mid-August. DSHS executive staff was notified of increased cases of human infection of West Nile Virus in July 2012. As a result, consultation and planning activities were initiated with DSHS Health Service Region (HSR) leadership, local health department leadership, emergency management, and local elected officials. DSHS activated the State Medical Operations Center and its public health emergency preparedness functions on August 9, 2012. Requests were received from local jurisdictions for state support of outbreak response. This signaled that the outbreak had reached a critical milestone and that normal control and abatement measures at the local level were inadequate to prevent an increasing incidence of disease or avert increasing numbers of death related to the neuroinvasive form of the disease. The response to this outbreak was rare in the state’s history. It was the first time in over 40 years that some mitigation activities, such as aerial spraying, had been considered or used at the state level as a vector control activity to prevent disease.

To support the response to this outbreak, DSHS staff in Austin and the HSRs began a multi-faceted approach to support local health departments and elected officials to prevent, mitigate, and respond to the outbreak. DSHS expended approximately $3.4M in support of local disease control efforts. Approximately $2.7M of that total was spent on aerial distribution of mosquito adulticide nearly all of which took place in Dallas and Denton Counties. The use of this intervention was controversial and required an extraordinary level of communication and coordination. The Commissioner of Health was thoroughly engaged. He participated in national press conferences hosted by CDC, conference calls with state and local stakeholders, and represented the agency in audio and video public service announcements. DSHS created information outreach materials for distribution by local jurisdictions. Web-based information was created or modified at all levels of government. The State’s air services contractor’s public information team was key to managing risk messages through Metroplex media outlets regarding the pesticides used. An example of the divergent level of acceptance of aerial distribution of pesticides by communities is the fact that only 18 of the 32 jurisdiction within Dallas County opted to have aerial spraying performed.

DSHS does not have a medical entomologist. DSHS and severely impacted local jurisdictions received information and guidance on mosquito control from CDC. Additional assistance on this issue came from Texas A&M University, Texas AgriLife Extension Service, and the State’s vector control contractor. In addition, CDC deployed two teams of subject matter experts in response to DSHS requests
for Epi-Aids. One team assessed the validity of using volume of WNV testing as a leading indicator of case count trends. This was determined to be a valid tool in assessing the direction of the epidemiologic curve within the following one to two weeks. The other team assessed mosquito control practices in north-central Texas. The task was made difficult by marked variability in local mosquito control practices and the late point in the cycle at which aerial operations began. The Epi-Aid team concluded that use of aerial distribution of adulticide resulted on a significantly fewer human cases as compared to untreated areas.

An in-depth process of after action review of the 2012 response led to revised surveillance and response plans at all levels of government in Texas.

Human Brucella canis Infection Acquired from a Puppy, NYC, 2012

This topic was presented by Dave Smith, State Veterinarian, New York. Catherine Dentinger from CDC was available on the telephone.

Background: A three-year-old child presenting with fever and dyspnea was hospitalized for 48 hours for bronchiolitis and discharged without antibiotics. Her admission blood culture grew *Brucella canis*.

Methods: Clinical and public health agencies investigated.

Results: The child, who received antibiotics for 45 days, remained asymptomatic; 19 laboratory workers received post-exposure prophylaxis. Blood from the child’s eight-week-old puppy grew *B. canis*, the puppy was euthanized. Isolates from the puppy and the child were genetically similar. The puppy and its littermate, which was sold to a Pennsylvania (PA) family, originated from an Iowa breeder. The breeding facility was subsequently quarantined. The PA puppy tested positive for *B. canis* by serology; the owners were not tested.

Conclusion: This first confirmed report of *B. canis* transmission from a canine to a child in the U.S. highlighted the need for coordinated disease control efforts of animal and human health agencies.

Oral Rabies Vaccination Program Cost Analysis
Brody Hatch¹, Stephanie Shwiff¹, Karen Moxey¹
¹National Wildlife Research Center, USDAAPHIS, Wildlife Services (WS)Stephanie Shwiff presented via telephone.

In the U.S., rabies prevention focuses on vaccinating the main reservoir, wildlife, through the use of large scale oral rabies vaccination (ORV) programs. These programs typically include aerial operations in which small vaccine-laden baits are dropped from aircraft over large portions of specific wildlife habitat. An examination of the costs associated with these programs indicate that typical ORV program costs include salaries, baits, aircraft operations, enhanced surveillance and public communication costs, however, baits comprise the most significant portion of costs. Given the important role of baits in the total cost structure we performed a sensitivity analysis examining different bait prices and associated levels of efficacy, measured by the accepted level of seroconversion. We ran 10,000 Monte Carlo, and Bernoulli simulations to estimate the respective efficiency cost of low, medium, and high efficacy baits. We further analyzed the relative cost effectiveness using a simple binomial mass probability function. Our results examine the tradeoff between prices and efficacy. Using the binomial mass probability analysis, results indicate that the increased price and efficacy have implications for economic efficiency.

Texas Gray Fox Rabies Contingency Study
Ernest “Skip” Oertli, DVM, PhD, DACVPM
Texas Department of State Health Services, Director of Oral Rabies Vaccination Program (retired August 2013)

Beginning in 1996, the Texas Department of State Health Services, in conjunction with its’ partners Texas Wildlife Services, Texas Military Forces and Merial, have had a rabies control plan utilizing oral rabies vaccine for the Texas gray fox rabies variant. The epizootic zone involving the Texas gray fox variant was encircled at first, and then the baited barrier zone was constricted annually until the entire area could be blanketed with oral rabies vaccine packets. Extremely successful, Texas gray fox variant was thought to have been eliminated. The last case of this variant was identified by passive and active surveillance in May 2009. In May 2013, a three year old, home grown, replacement heifer was diagnosed
with the Texas gray fox variant. This presentation reviewed the actions taken in response to the case and future management considerations.

Emily W. Lankau, DVM, PhD
LandCow Consulting
Oral rabies vaccine (ORV) baits have been successfully applied to reducing rabies virus transmission in U.S. wildlife populations, including coyotes and raccoons. Critical review of raccoon ORV campaigns is instructive for better understanding how different program structures and bait application methods can benefit reduction in virus circulation, or even lead to elimination of raccoon rabies in focal geographic regions. A diversity of raccoon rabies control programs — including ORV campaigns in Cape May, New Jersey; Cape Cod, Massachusetts; Long Island, New York; and the eastern border of Ohio — were reviewed to better understand practices contributing to successful and cost-effective ORV campaigns. These programs demonstrate that successful mitigation of human health risks from raccoon rabies can be accomplished in a time- and cost-effective manner using Raboral V-RG®, especially if doses are distributed at sufficient target density using a multi-modal, biannual approach to effectively reach both juvenile and adult raccoons in heterogeneous urban landscapes. Finally, sustained risk mitigation may be highly dependent on local geography, with increased chances of sustained elimination of raccoon rabies virus variant from areas with clear geographic boundaries to raccoon migration (e.g., peninsula or islands) that enhance ORV barriers and prevent reintroduction of the virus.

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Zoonotic Diseases and Pet Stores – Alaska
Robert Gerlach, DVM
State Veterinarian, Alaska
Dr. Gerlach presented the results of a study, Assessing Awareness of Zoonoses and Biosecurity among Alaskan Pet and Feed Stores. The study was undertaken by an MPH student, Amanda Reiff. The purpose of the study was to evaluate pet store and feed store owners’ understanding of zoonoses and biosecurity. Multiple gaps in understanding and knowledge were found. Education and outreach efforts are underway.

A Field Evaluation of Raboral V-RG® as an Oral Rabies Vaccine in Striped Skunk (Mephitis mephitis)
Joanne Maki, DVM, PhD
Global Technical Director, Veterinary Public Health
Merial Limited, Athens, GA 30601
Skunk rabies is an emerging public health concern nationally. In Texas, wildlife oral rabies vaccine (ORV) programs targeting coyotes and foxes have successfully controlled previous rabies outbreaks. Due to these zoonotic disease management programs, the striped skunk (Mephitis mephitis) is now the leading rabid terrestrial wildlife species in Texas with hundreds of rabid skunks reported from suburban and metropolitan areas. The Texas Department of State Health Services (TDSHS) has used targeted distribution of Raboral VR-G® to control wildlife rabies since 1995, resulting in elimination of the canine rabies virus variant from coyote populations in 2004 and a substantial reduction in the incidence of fox rabies in West-Central Texas. While skunk biology makes this species a challenging ORV target, field data collected in Texas suggest that Raboral VR-G® can effectively immunize skunks against rabies virus infection in a field setting. This presentation will discuss the challenges of effectively vaccinating skunk populations against rabies as well as report preliminary results of a field trial currently underway in East Texas evaluating field parameters for ORV bait distribution addressing skunk rabies in Texas.

Human Rabies Investigation Texas – 2013
Tom J. Sidwa, DVM, MPH
State Public Health Veterinarian, Texas
The case of human rabies that is described in this presentation is the first in Texas since 2009. The patient in 2009 survived. Unfortunately, the patient for whom this investigation was conducted succumbed to his disease.

A 28 year-old man, a farmer from Guatemala, had previously entered the U.S. illegally and had worked as a painter in Boston, Massachusetts. He returned to Guatemala in 2011 to visit family. There was a failed attempt to enter the U.S. in 2011. On April 20, 2013 he once more embarked on a trip with the intent of entering the U.S. On April 24th or 25th, he called family in Guatemala from Chiapas, Mexico, a Mexican state bordering Guatemala. On May 8 he once again called home, this time from Reynosa, Mexico which is across the border from Hidalgo, Texas. During both conversations, his family heard nothing suggesting he was ill. On May 9, he entered Texas and was apprehended by U.S. Border Patrol (BP) in Hidalgo County and transferred to the McAllen Station. He remained in McAllen until May 11 when he was transferred to Weslaco Station, also in Hidalgo County. On May 12, he was transferred to Harlingen Station in Cameron County. Later that day, Immigration and Customs Enforcement (ICE) assumed custody. He was briefly at the Port Isabel ICE facility en route to the Brooks County Detention Center (under contract with ICE).

Onset of illness was May 16 with a complaint of insomnia. On May 17, he was anxious with dysphagia and dyspnea. On May 18, he was spitting excessively apparently associated with dysphagia. He had the sensation of choking. He was transferred to the Medical Unit of the facility. Given the identified complaints and observation of tachycardia, the patient was transferred by ambulance to an Emergency Department (ED) in Kleberg County.

At the ED, tachycardia persisted. The patient had to be restrained due to thrashing. Extensive bilateral subcutaneous and intramuscular emphysema of the neck and lower face and pneumomediastinum were diagnosed through CT scan. The patient was then transferred to a hospital in Nueces County. The patient was intubated and anesthetized only to discover that the pneumomediastinum had resolved spontaneously. However, the patient was not able to be extubated successfully and exhibited altered mental status.

On June 5, the Centers for Disease Control and Prevention (CDC) and the Texas Department of State Health Services (DSHS) were contacted by the attending physician to discuss rule-out of rabies. Appropriate specimens were submitted to CDC. On June 7, rabies was confirmed. The variant was identified as a canine variant known to circulate in Mexico, Honduras, and El Salvador (CDC had no exemplars from Guatemala for comparison). On June 8, CDC arranged for consultation between providers and Dr. Willoughby who developed the Milwaukee Protocol. The Milwaukee Protocol has been used to guide treatment of human rabies with varying levels of success. On June 11, further treatment was deemed to be futile. With family permission, support was withdrawn and the patient died. On June 14, an autopsy was performed in Houston. Rabies was confirmed.

The period of concern for the contact trace-back is 14 days prior to illness onset until death. In this case it is May 2 through June 11, 2013. Many of the potential contacts traveled with or were detained with the patient. Many of these people were already remanded to family in the U.S., transported to ICE facilities in the U.S., or had already been deported to their countries of origin. Other categories of contacts are healthcare workers, medical transport personnel, BP personnel, and ICE personnel. The investigations fell to domestic, federal, and international jurisdictions. The domestic investigation involved identifying and conducting risk assessment for Texas residents. It was carried out by Local Health Departments (LHD) where a LHD existed. DSHS Health Service Region -11 Zoonosis Control staff conducted the domestic investigation where no LHD exists and supported the involved LHDs as needed. CDC coordinated with other federal partners on the federal investigation which entailed international communication/notification and identifying and conducting risk assessment for detainees still residing in the U.S. Deportees who should be assessed were identified, and the information was shared with the appropriate ministries of health. The international investigation was the responsibility of the health authorities in the countries to which potentially exposed detainees had been deported. A CDC Epi-Aid was requested by DSHS to gather information on the identity of potentially exposed detainees. Assessment tools were developed with weighted criteria to allow gradation of exposure risk.

Conference calls and emails were heavily utilized to accomplish the required level of communication. On June 12, CDC posted case information to EpiX and ICE did a press release describing the case, in compliance with law mandating the action when a detainee in their custody dies.

**Domestic Investigation Outcome**
Non-Healthcare Workers (BP and contract detention center staff)
- 179 assessments were completed
- 3 persons received post-exposure prophylaxis (PEP)
  - Had close physical contact with the patient
  - May have been exposed through contact with the patient’s saliva on a fresh, open cut or wound
Healthcare Workers (Detention Center Medical Unit staff, EMS from two ambulances, and staff from two hospitals)
- 38 assessments were completed
- 7 persons received PEP
  - 5 may have been exposed through contact with the patient’s saliva on a fresh, open cut or wound
  - 2 requested PEP as a precaution

Federal Investigation Outcome
- 549 detainees moved through the same facilities as the patient with overlapping times
  - 378 were considered to be at increased risk of rabies exposure
    - 10 countries of origin represented (primarily Guatemala and Mexico)
  - 49 of the 378 were considered to be at moderate risk
    - 5 countries represented
  - 19 of 378 were considered to be at highest risk
    - All from Guatemala
    - 5 individuals crossed into the US with the patient and remained in ICE custody
    - CDC notified the involved states
- All domestic detainees identified, risk classified, and notified
- All international ministries of health notified by PAHO
- ICE facilities (1 high risk/16 moderate risk)
  - High risk – PEP
  - Moderate risk – No PEP recommended

International Investigation Outcome
- Guatemala
  - Case patient was bitten by a dog on April 2
- Guatemala (18 high risk / 13 moderate risk)
  - 4 received PEP due to risk assessment
  - 2 received PEP based upon request
- El Salvador (3 moderate risk)
  - 1 received PEP for BP dog bite (not associated with case)
- Honduras (4 moderate risk)
  - No PEP administered
- Mexico (13 moderate risk)
  - No information

This investigation is indicative of the ability of a multijurisdictional, multi-disciplinary team to work cooperatively to achieve a shared public health goal.

Committee Business:
The Committee voted to support a resolution presented by the Committee on Infectious Diseases of Cattle, Bison, and Camels. The resolution encourages state regulatory agencies in states that allow the sale of raw milk to include Coxiella burnetti surveillance in their raw milk program.
The Committee passed a resolution requesting an increase in funding for the USDA-APHISWS oral rabies vaccination program.
Topics for a One Health Symposium next year were discussed.