

REPORT OF THE COMMITTEE ON PARASITIC DISEASES

Chair: Dee Ellis, TX

Vice Chair: David Winters, TX

Gary Anderson, KS; Bob Bokma, MD; Corrie Brown, GA; Matt Cochran, TX; Joseph Corn, GA; Mark Davidson, CO; Anita Edmondson, CA; Richard Gerhold, TN; Chester Gipson, MD; Thomas Hairgrove, TX; Greg Hawkins, TX; Larry Hawkins, MO; Terry Hensley, TX; Linda Hickam, MO; Bob Hillman, ID; Thomas Holt, FL; Charlotte Krugler, SC; Linda Logan, TX; Francine Lord, ONT; David Marshall, NC; Terry McElwain, WA; Daniel Mead, GA; Matthew Messenger, MD; Ernie Morales, TX; Don Notter, KY; James Novy, TX; Angela Pelzel-McCluskey, CO; Barbara Porter-Spalding, NC; Shawn Schafer, ND; Irene Schiller, ITA; Andy Schwartz, TX; Charly Seale, TX; John Shaw, AA; David Smith, NY; Robert Stout, KY; Paul Ugstad, NC; Arnaldo Vaquer, VA; Sherrilyn Wainwright, ITA; James Watson, MS.

The Committee met on October 23, 2012 at the Town and Country Hotel, from 8:00 a.m. – 12:00 p.m. There were 17 members and 29 guests present. The Committee reviewed the charge of the Committee and the USDA response to last year's resolutions.

***Ascaris Suis* Case in Maine**

Don Hoenig

Dr. Hoenig reported on a paper he coauthored in the Morbidity-Mortality Weekly Report which was published on May 24, 2013.

During April 2010–March 2013, the Maine Department of Health and Human Services investigated multiple cases of ascariasis in humans that had been reported by health-care providers, veterinarians, and patients. All of the cases were in persons who had lived or worked on Maine farms and had frequent exposure to pigs. Ascariasis, a parasitic roundworm infection caused by *Ascaris* species, is the most common human intestinal worm infection globally. However, because ascariasis is not a reportable disease, limited data exist regarding the incidence of this infection in the United States (1), and the number of annual cases in Maine is unknown. After investigation, 14 persons on seven farms in Maine were identified with *Ascaris* infection.

Niche Pork Production Outreach

Jennifer Koeman, National Pork Board

The emergence of “niche” pork production with different biosecurity parameters, such as outside access, presents potential public health/food safety risks. For example, pigs raised in outdoor production settings, or with outdoor access, in close contact with rodents, cats and wildlife have increased risk of acquiring *Trichinella* and *Toxoplasma* infections. Pork Checkoff has initiated an effort to better understand the information needs and information network within the niche pork production community and increase awareness of good production practices to help minimize these risks.

SCWDS Arthropod Surveillance

Joe Corn, Southeastern Cooperative Wildlife Disease Study (SCWDS)

Dr. Joseph Corn and Ms. Stacey Vigil, Southeastern Cooperative Wildlife Disease Study (SCWDS), University of Georgia, Athens, Georgia; and Dr. James Mertins, USDA-APHIS-National Veterinary Services Laboratories (NVSL), Ames, Iowa, gave a report on SCWDS Arthropod Surveillance. The SCWDS, in collaboration with the USDA-APHIS- VS, conducts surveys for exotic arthropods on free-ranging wildlife in the southeastern United States. The current objectives of SCWDS surveys are to determine the wildlife host range of *Amblyomma cajennense* and other possible equine piroplasmis vectors in South Texas; to determine if wildlife currently serve as hosts for *Rhipicephalus (Boophilus) annulatus* and *R. (B.) microplus* in South Texas; and to conduct surveys for *Culicoides* vectors of bluetongue virus and epizootic hemorrhagic disease virus in the Southeast. Preliminary results from the initial tick collections in Texas and results from *Culicoides* surveys were discussed. Over 25,000 arthropods representing 20 species of ticks and 77 species of other ectoparasites have been collected from wildlife at eight sites in South Texas. The surveillance program for endemic and exotic species of *Culicoides* has identified new state records for nine species of *Culicoides* in 13 states and surveillance is ongoing.

U.S.-Panama Screwworm Commission (COPEG): The Year in Review and Research Directions

John Shaw, USDA-APHIS-ARS

The U.S.-Panama Screwworm Commission completed the eradication of Panama by 2002 and was declared screwworm-free in 2006, with a permanent sterile insect barrier established. The sterile insect production plant began producing sterile flies in early 2009 for the barrier on the Panamanian Isthmus. Now with a stable barrier protocol in place, attention is being paid to cost effectiveness in field operations, risk management, efficient sterile insect dispersal, production, and the physical sterile insect production plant. A review will also be made on the progress by researchers at COPEG in their work which has great promise of increasing cost effectiveness of maintaining the barrier in the future. Cost effectiveness is ever more important as funding becomes more and more scarce.

USDA-ARS, Knippling-Bushland U.S. Livestock Insects Research Laboratory (KBUSLIRL) Research Activities

Bob Miller and Beto Perez DeLeon, USDA-APHIS-ARS

Tick and biting fly research continues at the Knippling-Bushland U.S. Livestock Insects Research Laboratory (KBUSLIRL) at a brisk pace. This presentation consists of a summary of but a few of the current agricultural problems our laboratory scientists and staff are currently working to solve. The threat of African Swine Fever (ASF) introduction into the U.S. through Mexico by feral pigs and associated vector competent *Ornithodoros* ticks has been a recent research thrust for the laboratory. A discussion on this topic will consist of recent visits by Ukrainian scientists to the KBUSLIRL and reciprocal visits by ARS scientists to Russia and the Ukraine along with a discussion of future research needs. Next, an update on multi-pesticide resistance in the cattle fever tick, *Rhipicephalus microplus* will be discussed and how this threatens the success of the Cattle Fever Tick Eradication Program. Finally, novel treatment strategies of the control of horn flies will be discussed along with how they can be integrated with other technologies on the market.

The Screwworm Eradication Program: From an unlikely dream to an outstanding success

John Skoda, USDA-APHIS-ARS

Screwworm myiasis is devastating to warm blooded animals. Eradication of the screwworm from mainland North America using the sterile insect technique (SIT) is an unprecedented achievement; reinvasion is prevented by maintenance of a barrier at the Panama – Colombia border. Throughout the 55 plus years of the Program, innovative research and its application has benefited the successful application of SIT. Here we give a brief history of the program and an update on recent research progress by the Screwworm Research Unit (SRU) at the 117th Annual Meeting of the U.S. Animal Health Association. Molecular genetic techniques are providing an understanding of the genetic diversity of screwworms sampled from across their current range. Transgenic techniques are being used to develop a males-only, genetic sexing strain of screwworms. Potassium permanganate has been shown useful in reducing ammonia production from larval developmental media and to be a viable replacement for formaldehyde as an antimicrobial in the larval diet. SRU recommended updates to navigation and dispersal equipment have been installed on the aircraft that disperse sterile screwworms in the barrier zone; more efficient placement of flies will result. Volatiles that attract female screwworms have been identified from wounds of animals. A new strain of screwworms has been developed from material collected in Colombia. Mating studies between screwworms from central Brazil, Jamaica, and Panama showed no mating barriers, indicating that the current strain in mass production would be effective if used in an eradication effort in South America. Research has been initiated to develop a chemically defined diet for screwworm larvae; this will allow for economical substitutes to be identified for use in mass rearing screwworms. The SRU has consistently reached research milestones established in the interest of providing updated or novel answers to critical questions posed by the Panama – U.S. Commission for Eradication of Screwworms.

Puerto Rico Tick Vaccine Trial

Bob Miller, USDA-APHIS-ARS

Puerto Rico Project Report:

The USDA has recently received a verbal agreement from the Puerto Rican Department of Agriculture (PRDA) to develop an integrated cattle fever tick (CFT), *Rhipicephalus microplus*, control program. The objective is to create science-based knowledge to integrate technologies for sustainable control of the CFT infesting dairy farms and cattle in Puerto Rico. The project will consist of five phases and will integrate current chemical, biological, cultural, and immunological controls based on sound epidemiological knowledge of the CFT problem on the island.

Cattle Fever Tick National Update

Matt Messenger, USDA-APHIS-VS

The Cattle Fever Tick Eradication Program (CFTEP) was allocated approximately \$9 M during fiscal year (FY) 2013. The CFTEP is now included in the Cattle Health line item along with other national programs, such as bovine tuberculosis and brucellosis. The FY 2014 appropriation for the Cattle Health line item is estimated to be \$92 M. The FY 2014 allocation for the CFTEP may be similar to FY 2013 funding levels; however, it may possibly decrease.

Four technical updates were completed for the Code of Federal Regulations Part 72. The title of the Part was changed from "Texas (Splenetic) Fever in Cattle" to "Bovine Babesiosis". Other updates included adding additional common names for bovine babesiosis, adding *Rhipicephalus* as the new genus instead of *Boophilus*, deleting the tick species *Rhipicephalus evertsi evertsi*, and deleting all expired acaricides leaving coumaphos as the only permitted acaricide remaining.

APHIS is engaged in Endangered Species Act consultation with the U.S. Fish and Wildlife Service (FWS) on several on-going projects. The first project involves consultation on how APHIS maintains the river trails that are used by the Mounted Patrol Inspectors along the Rio Grande for surveillance and the apprehension and inspection of stray livestock. APHIS uses various hand tools, mowers, bulldozers, and other equipment to periodically keep these trails clear and safe for surveillance activities on horseback. APHIS has received a draft Biological Opinion from the FWS and a response is pending from APHIS. On a different consultation, APHIS received a final Biological Opinion from the FWS to allow the University of Georgia's Southeastern Cooperative Wildlife Disease Study to continue conducting tick surveys in south Texas. Consultation is on-going for two additional projects: the Tick Control Barrier Environmental Impact Statement and the nilgai harvest in the Boca Chica refuge area.

APHIS continues to work with Mexico regarding cattle fever tick issues. A draft proposed rule recognizing the States of Sonora and Baja California (Norte) as being free of cattle fever ticks is currently under departmental clearance. The State of Chihuahua has also requested to be recognized as fever tick-free, and APHIS has initiated the process of completing a risk assessment as well as following up with the State on addressing recommendations from the APHIS review team visit during 2012. Mexico's new National Tick Agreement was officially published September 10, 2012. APHIS is closely monitoring the implementation of this Agreement to ensure that there will be no significant impacts on the three Mexican states we are currently considering as being fever tick-free.

National Piroplasmiasis Update/ Thioredoxin Protocol

Angela Pelzel, USDA-APHIS-VS

Since November 2009, more than 231,664 domestic U.S. horses have been tested for equine piroplasmiasis (EP) through active surveillance and movement testing with 122,760 horses tested at approved National Animal Health Laboratory Network (NAHLN) laboratories and 108,904 horses tested at National Veterinary Services Laboratories (NVSL). To date, 215 EP-positive horses (205 *Theileria equi*-positive, 10 *Babesia caballi*-positive) have been identified through this surveillance. These positive horses are unrelated to the 2009-2010 *T. equi* outbreak on a Texas ranch where 413 positive horses were identified in connection with the outbreak and natural tick-borne transmission on the ranch was documented to have occurred over at least 20 years. Of the 215 positive horses identified through active surveillance, 172 were Quarter Horse racehorses, 13 were Thoroughbred racehorses, one was a Quarter Horse roping horse and 29 were horses previously imported to the United States before August 2005 when the complement fixation test was being used as the sole import test type for EP. The epidemiology investigations conducted in all of these cases have indicated no evidence of tick-borne transmission and the cases in racehorses specifically have involved iatrogenic transmission as the method of spread.

All EP-positive horses are placed under State quarantine and the horse owners are offered four options for long-term management under state/federal regulatory oversight: 1) life-time quarantine, 2) euthanasia, 3) export from the country, or 4) long-term quarantine with enrollment in the APHIS-VS and

ARS treatment research program. Of the 215 positive horses identified, 120 have either died or been euthanized, 14 have been legally exported, and 32 have been enrolled in the treatment research program. From the Texas ranch outbreak, 163 horses were enrolled in the treatment research program and have completed treatment. Successful results from the treatment research program have been recently reported by Ueti et al. in "Re-emergence of the Apicomplexan *Theileria equi* in the U.S.: Elimination of Persistent Infection and Transmission Risk" published in *PLoS One*, September 2012.

In response to Resolution #21 from the 2011 USAHA meeting, an internal APHIS-VS working group was formed to evaluate data from the VS/ARS research treatment program and consider development of a policy to release treated, cleared, test-negative horses from quarantine. The working group recommended that VS establish a policy for quarantine release of previously *T. equi*-infected horses that meet all the following criteria:

- Enrolled in the VS/ARS treatment research program as per VS Memo 555.20; and
- Treated using the ARS published high-dose imidocarb dipropionate treatment protocol under State or Federal supervision; and
- Permanently identified using an ISO-compliant microchip with the identification number held in a data repository accessible by State and Federal animal health officials; and
- Nested or real-time PCR negative on a series of at least three post-treatment samples collected a minimum of 30 days apart; and
- Negative by transfusion to a splenectomized horse or negative by the ARS Western Blot clearance test; and
- cELISA and CFT negative at NVSL

Additionally, the working group recommended that the State establish a compliance agreement with the horse owner to conduct the cELISA test annually for three years post-treatment as added assurance of continued disease freedom. These recommendations were accepted by VS Management and became policy in February 2013.

USDA Sceworm Response Plan Overview

John Zak, USDA-APHIS-VS

Dr. Zak gave a brief overview of the new USDA FAD Prep plan for screwworm response in North America.

Texas Equine Piro Update

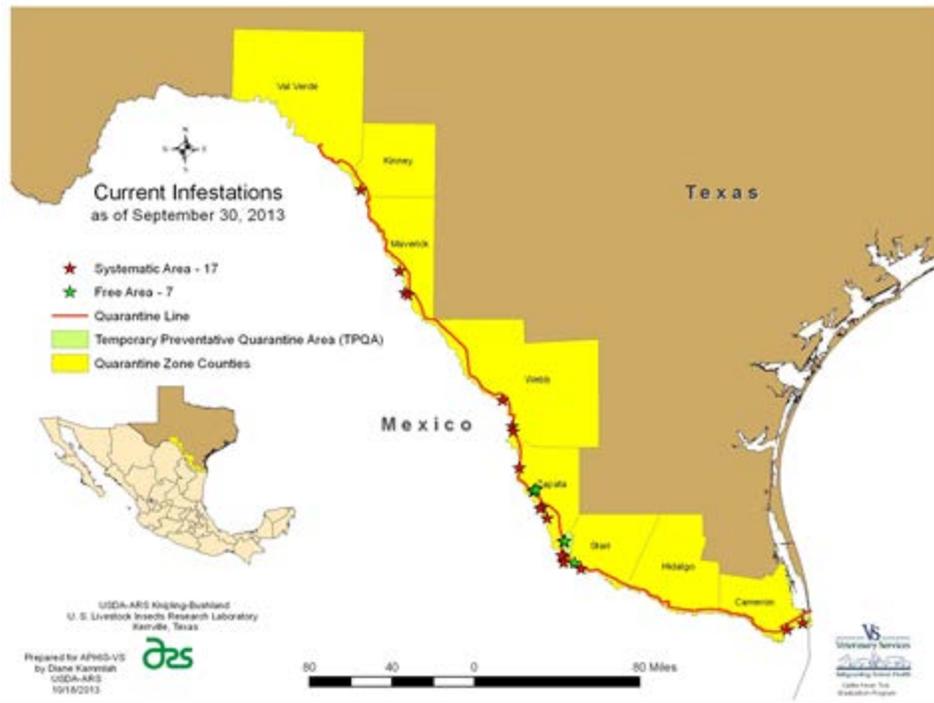
Andy Schwartz, Texas Animal Health Commission (TAHC)

Equine piroplasmiasis was first diagnosed in south Texas in October 2009, as part of the diagnostic work-up on a clinically ill horse. Testing of equine on adjacent premises ensued during the following year and disclosed no additional cases. In January 2012, a positive horse, unrelated to the original premises, was disclosed in Kenedy County. Subsequent epidemiological investigation led to the testing of all of the equine in the county, disclosing 17 horses on three separate premises as positive for *Theileria equi*.

Based on the high level presence of competent tick vectors and common equine movement practices of equine in both counties, the TAHC designated Kleberg County as a high risk county for equine piroplasmiasis in March 2013. A county-wide test of all equine in Kleberg County was conducted during the spring and summer of 2013. A total of 987 equine on 358 premises were tested for both *Theileria equi* and *Babesia caballi*. The county-wide testing disclosed 19 horses (1.9% prevalence) on six premises as positive for *T. equi*.

Texas Cattle Fever Eradication Program Report October 2013

Kevin Varner, USDA-APHIS-VS



In October 2013, the Texas Cattle Fever Tick Eradication Program (CFTEP) reports a total of 24 infested premises (17 in the Permanent Quarantine Zone and 7 in the Free Zone) under quarantine. This continues a three year decline in the number of infested premises: 09/10 – 77 infested premises, 09/11 – 65 infested premises, 09/12 – 48 infested premises, 09/13 - 24 infested premises. In addition to the downward trend in the number of infested premises, the infestations that the CFTEP is detecting are located closer to the Rio Grande River.

The USDA and the Texas Animal Health Commission (TAHC) have pushed two new program initiatives during FY 2013. First, is the adoption of the Ivermectin Tub technology in the field. Under the INAD authority of the FDA the CFTEP has begun to use this technology to treat infested neighborhoods. To date, 66 premises with a total of 2,337 head of cattle have been treated using this technology. The tub technology allows the cattle in infested neighborhoods to self-treat and minimizes the need to gather cattle. The increased costs of maintaining cattle on infested pastures are due to the required gathering of the cattle every 2 to 4 weeks during the quarantine period. Cattle being treated using tubs are gathered less than half as often as those under previous treatment protocols.

Secondly, the TAHC and the USDA have worked with a major pharmaceutical company to produce a vaccine for cattle in the permanent quarantine zone. The vaccine has completed successful ARS pen trials. In early December 2013, TAHC and USDA will conduct a field safety trial using the final formulation of the vaccine. This safety trial is part of the APHIS- CVB approval process. By early 2014 the CFTEP plans on vaccinating all cattle in the permanent Quarantine Zone. The CFTEP plans on maintaining a mandatory vaccination program in the permanent quarantine zone.

This program dovetails with new animal ID requirements that the TAHC passed in 2013. Under these requirements all cattle in the permanent quarantine zone are required to be officially identified with an RFID tag.

USDA and TAHC staff will apply the required ID and vaccinate the cattle at the same time.

Committee Business:

There were two resolutions passed by the Committee, one related to encouraging Genetic Strain Typing of EP by USDA-VS and the second related to asking Congress to fund the construction of new facilities in Kerrville, Texas where cattle fever tick and screwworm research would be performed by USDA-ARS.