A JOINT PROJECT BETWEEN

USDA APHIS WILDLIFE SERVICES

AND

INDIANA DNR DIVISION OF FISH AND WILDLIFE

Indiana Wildlife Disease News

Volume 6, Issue 4 Fall 2011

Special points of interest:

- Sarcocystosis
- CWD update
- TB update
- BOAH on the move

Inside this issue:

Disease in Focus

Sarcocystosis

Description

Sarcocystosis is a disease caused by organisms of the genus *Sarcocystis.* Members of this genus are unicellular parasites found in muscles and other tissues of mammals, birds and reptiles.

Uncertainty as to the exact classification of *Sarcocystis* has existed in the past with it being identified as a protozoan by some authorities and a fungus by others. In recent experiments it has been demonstrated that some species of *Sarcocystis* in cattle and sheep are the intermediate stage of coccidian parasites found in cats, dogs and humans.

There are some morphological differences between the *Sarcocystis* cysts of different animals. The sarcocysts found in sheep, rabbits, mice and ducks are macroscopic in size, whereas other mammalian forms (deer, moose and elk) are microscopic. In ducks the cysts are whitish streaks which resemble grains of rice, while the cysts in rabbits are thinner and more elongate.

There are numerous species of *Sarcocystis* in the literature with

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Disease Surveillance Update

Update on Bovine Tuberculosis surveillance in Indiana

After months of testing, traces, paperwork, and producer interviews, the Indiana State Board of Animal Health (BOAH) staff has wrapped up the cattle investigation of bovine tuberculosis (TB) in a Dearborn County, Indiana beef operation. The quarantine issued on the index herd was lifted in August after the site was cleaned, disinfected, and then left empty for 60 days. Of the more than 1000 head of cattle and three goats tested, only 15 positive animals were identified as TB-positive—all located on the index site. Wildlife samples from around the index site were collected, and none tested positive for the disease.

While cattle testing is complete, sampling will continue with the opening of hunting season on white-tailed deer. The Indiana Department of Natural Resources (DNR) will be collecting heads from hunter-harvested deer at select high-volume check stations in the southeastern portion of the state during firearms opening weekend. BOAH veterinarians will collect tissues from the heads for testing at the Animal Disease Diagnostic Laboratory at Purdue.

All of the investigative and sampling efforts could not have been completed without the cooperation of the DNR, our partners at Indiana's USDA-Animal and Plant Health Inspection Service, and numerous private practitioners who dedicated their time and talents. This cooperative effort was reflected in the speed this TB investigation was completed.

Indiana has held its bovine TB-Free status since 1984—even despite recent events. The state will continue to maintain that rating, because the proper steps were taken to limit the possibility of another infection. Maintaining a Free status is so important to commerce in our state. Without Free status, producers would be required to test their animals before shipping them interstate. This places an added burden on the producer by increasing the cost and amount of time it takes to move animals.

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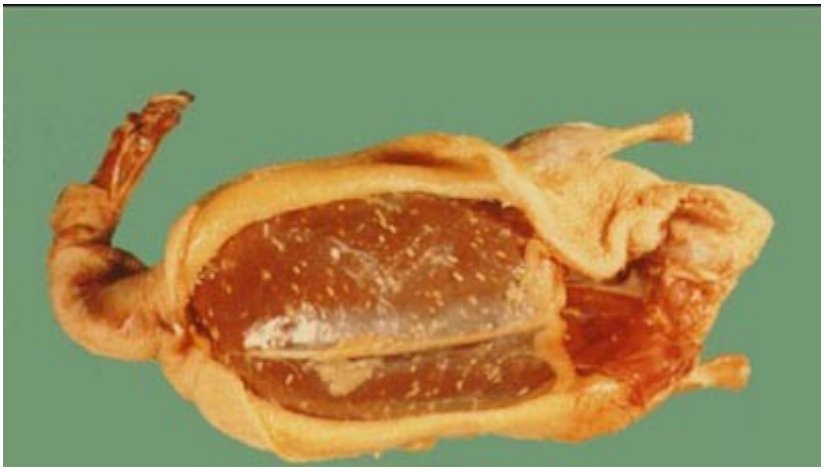
Sarcocystosis (Continued from pg 1)

most of them being named with respect to the host in which they are found, i.e. *S. rileyi* (duck), *S. cuniculi* (rabbit), *S. tenella* (sheep) and *S. miescheriana* (pig). These parasites are not always host specific and it is possible that all represent a single species, *S. miescheriana*, the organism first found in a mouse by Miescher in 1843. Accurate classification will require further knowledge of the complex and varied life cycles of these parasites.

Distribution

Sarcocystis is worldwide in distribution. It is found in many species, including sheep, cattle, horses, swine, dogs, cats, rabbits, mice, chickens and humans. Many wildlife species have been found to be infected, including deer, moose, elk, caribou, ducks, seals and many others.



Sarcocystis (yellow dots) in the breast muscle of a duck. (Photo: Michigan Wildlife Disease Manual)

In Michigan, species identified with sarcocystis are mallard duck, black duck, redhead duck, common goldeneye, blue-winged teal, Canada goose, ring-necked pheasant, moose, cottontail rabbit, red-tailed hawk, cooper's hawk, sharptailed grouse, American woodcock and morning dove. Each year several ducks are diagnosed with the disease. Mallards and black ducks are the ducks most commonly reported with the disease. Occasionally rabbits are identified with the organism. A survey of 208 white-tailed deer from Ontario, Texas and Wisconsin showed 80% to be infected. Four of 16 white-tailed deer were found infected in a small survey in Michigan.

Transmission and Development

The mode of transmission from animal to animal is incompletely understood. For many years it was believed *Sarcocystis* was transmitted by ingestion of flesh containing sarcocysts. However, now another indirect method of infection has been proven whereby carnivores and omnivores pass an infective stage of the parasite in their feces. An animal is infected by ingesting material contaminated by the infected feces.

Clinical Signs and Pathology

In most animals *Sarcocystis* infections are not considered to be of any serious pathogenic significance. However, heavy infections have caused mortality in sheep, pigs and mice. A recent Oregon study reports infection and death in mule deer fawns experimentally inoculated with sporocysts of *S. hemionilatrantis*.

There are no recognizable signs of the infection in most living animals, and a diagnosis of *Sarcocystis* is almost always made after death. In heavy infections, lameness, weakness and paralysis have been reported.

Diagnosis

A diagnosis is usually made by finding the cysts in striated muscle after the animal's death. The large cysts found in ducks, sheep, rabbits and mice are easily seen with the unaided dye as grayish to whitish streaks, 1-10 mm in length, running lengthwise with the muscle fibers. In other animals the cysts are microscopic and can only be found by histological examination.

Other tests used in the diagnosis of *Sarcocystis* are complement-fixation and dermal sensitivity tests.

Treatment and Control

No effective treatment is known. Since the disease can be transmitted by the ingestion of feces containing sporocysts, good sanitation and hygiene are important in preventing the disease.

Significance

Domestic animals that are heavily infected may be condemned as unfit for human consumption. Ducks and rabbits are the species of Michigan wildlife that hunters and wildlife biologists are most likely to find infected with *Sarcocystis*. At this time so much is unknown about *Sarcocystis* that it is recommended that infected meat from ducks and rabbits not be used for human consumption or fed to cats and dogs.

Source: Michigan DNR Wildlife Disease Manual found at http://www.michigan.gov/wdm (last accessed on Dec 2011).

Bovine Tuberculosis Surveillance Update (Continued from page 1)

Throughout this investigation, what became most obvious was the value of Indiana's premise ID program and the importance of electronic animal identification. Our ability to identify cattle locations and producer contact information with the click of a mouse saved BOAH countless man hours and travel expenses in these tough budgetary times. **That** has been the most important partnership component of this entire incident. My thanks to all the producers, veterinarians, Extension educators and the many others who helped make Indiana's premise ID program the best in the nation.

Bret D. Marsh, DVM

Indiana State Veterinarian

Source: Board of Animal Health Quarterly Newsletter

CWD found in captive white-tailed deer in Missouri

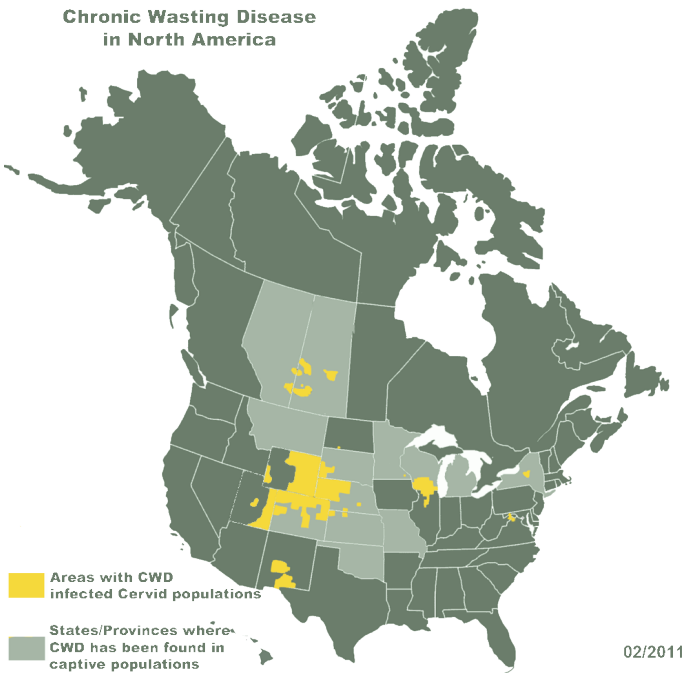
The Missouri departments of Agriculture, Conservation and Health and Senior Services and the U.S. Department of Agriculture announced that a captive white-tailed deer in Macon County, Missouri has tested positive for Chronic Wasting Disease (CWD). CWD is a neurological disease found in deer, elk and moose.

"We have a plan in place and our team is actively working to ensure that this situation is addressed quickly and effectively," said State Veterinarian Dr. Linda Hickam. "Fortunately there is no evidence that CWD poses a risk to humans, non cervid livestock, household pets or food safety."

The animal that tested positive for CWD was a captive white-tailed deer inspected as part of the State's CWD surveillance and testing program. Preliminary tests were conducted by the USDA National Veterinary Services Laboratory in Ames, Iowa.

Upon receiving the confirmed CWD positive, Missouri's departments of Agriculture, Conservation and Health and Senior Services initiated their CWD Contingency Plan. The plan was developed in 2002 by the Cervid Health Committee, a task force comprised of veterinarians, animal health officers and conservation officers from USDA, MDA, MDC and DHSS working together to mitigate challenges associated with CWD.

In February 2010 a case of CWD was confirmed in Linn County on a captive hunting preserve operated by the same entity, Heartland Wildlife Ranches, LLC. The Linn County facility was depopulated and no further infection was identified at that facility. The current case was identified through increased surveillance required by the management plan implemented from the previous CWD incident.



CWD locations throughout North America. Map courtesy of Chronic Wasting Disease Alliance (www.cwd-info.org).

CWD is transmitted by live animal to animal contact or soil to animal contact. The disease was first recognized in 1967 in captive mule deer in the Colorado Division of Wildlife captive wildlife research facility in Fort Collins, Colorado. CWD has been documented in deer and/or elk in Colorado, Illinois, Kansas, Maryland, Michigan, Minnesota, Montana, Nebraska, New Mexico, New York, North Dakota, Oklahoma, South Dakota, Utah, Virginia, West Virginia, Wisconsin, and the Canadian Provinces of Alberta and Saskatchewan. There has been no evidence that the disease can be transmitted to humans.

"Missouri's proactive steps to put a testing protocol in place and create a contingency plan years ago is proving beneficial. We are in a solid position to follow pre-established steps to ensure Missouri's valuable whitetail deer resource remains healthy and strong," said Jason Sumners Missouri's Deer Biologist, Missouri Department of Conservation.

For more information regarding CWD, please contact Missouri's State Veterinarian Dr. Linda Hickam at (573) 751-3377.

Source: Missouri Department of Agriculture and CWD Alliance Website (www.cwd-info.org)

Agency Update

BOAH - On the move again

The Indiana State Board of Animal Health (BOAH) central office will be moving to a new location at the Indiana State Fairgrounds the week of December 12. As a result, callers to the agency may experience some disruption to phone services on December 13 and 14.

After December 13, the agency's new address will be:

Indiana State Board of Animal Health
Discovery Hall, Suite 100
1202 E 38th Street
Indiana State Fairgrounds
Indianapolis, IN 46205

All phone numbers will remain the same. Only the BOAH fax number will change to 317/974-2011.

BOAH will be occupying the newly renovated Discovery Hall, which has historically been known as the "4-H Girls Dorm." The agency will be located on the building's ground floor.

Source: BOAH website

Disease Information Resource

New on-line resource for wildlife diseases

The American Association of Zoo Veterinarians (AAZA) has created a new resource for individuals and agencies who work with captive and free-ranging wildlife. The on-line manual covers a wide range of infectious diseases. Each information sheet contains a summary of the animals affected, transmission, clinical signs, severity, treatment, prevention and control, and zoonoses, as well as more detailed information on each of these topics.

Visit the AAZA website at http://www.aazv.org/displaycommon.cfm?an=1&subarticlenbr=759

Disease Surveillance Update

Epizootic hemorrhagic disease in Indiana

Despite an early start, Epizootic Hemorrhagic Disease (EHD) killed only a few deer in Indiana during 2011. In late August a dead 1.5 year old female deer in Vermillion County (west-central Indiana) was confirmed positive for EHD at the Purdue ADDL. Eight phone calls to the Division of Fish and Wildlife, West Lafayette office reported a total of 25-30 deer found dead, usually near water. Calls came from Vermillion, Fountain and Parke Counties.

Southwestern Indiana also had deer reported dead in Gibson, Perry, Pike, Posey, Spencer and Warrick Counties. A Posey County deer was confirmed positive for EHD, Type 2. Muscatatuck National Wildlife Refuge in Jennings County was the only other site reporting dead deer in the state.

Nationwide, EHD was reported in Michigan, North and South Dakota, Montana, Maryland, New Jersey, New York, and Pennsylvania. With the recent hard freezes, no further EHD deaths are anticipated.

EHD is an important disease of white-tailed deer caused by an orbivirus transmitted by a small biting fly of the genus Culicoides. Deer become feverish and seek relief in or near water. Other clinical sings may include a blue tinted tongue or eyes, ulcers on the tongue, drooling, and lack of fear to humans. The disease is often fatal to the deer, but some recover. Deer losses range from just a few to more than 50% of the population in a local area.

Article by D. Zimmerman, Indiana DNR

Midwest Wildlife Disease Update

November 2011

Leptospirosis Outbreak in Michigan Dogs

More than 20 cases of the life-threatening bacterial infection leptospirosis have been reported in Detroit-area dogs in the past 3 weeks, according to Michigan State University's Diagnostic Center for Population and Animal Health. Experts there diagnosed the specific strain of the disease, which can cause fatal damage to dogs and can be transmitted to humans.

In most cases, the dogs were not vaccinated against leptospirosis, or they had an uncertain vaccination history. Because this particular type of leptospirosis is associated with contact with rats, stray dogs are typically thought to be at highest risk.

"What is particularly unusual about this outbreak is that the dogs affected are not stray animals, but people's pets," said Carole Bolin, director of the Diagnostic Center. "Unfortunately, we expect to see more cases, and this is a very dangerous type of leptospirosis. Many veterinarians have never seen this type in dogs because it was markedly reduced by vaccination." Dr. Bolin performed testing and identified the particular strain of infection as icterohaemorrhagiae, which can cause severe disease in humans and animals. It is commonly carried by rats but also can be transmitted dog-to-dog or dog-to-human. Nine dogs reportedly died or were euthanized as a result of the disease, but there may be others.

Leptospirosis spreads by infected wild and domestic animals. The bacteria (leptospira) that infects these animals can reside in their kidneys, and the host animal may or may not appear ill. They contaminate their environment with living leptospira when they urinate. Pets can become infected by sniffing this urine or by contacting standing water that becomes contaminated by rain and water runoff. (Source: ProMed Digest V2011 #512, October 29, 2011, edited)

Cats Positive for Tularemia in Illinois

Three cats from 2 households in Savoy, Illinois have tested positive for tularemia, or "rabbit fever," an infectious disease that has been relatively rare in Illinois. The Champaign-Urbana Public Health District said the cats were diagnosed in July and September [2011] at the University of Illinois College of Veterinary Medicine.

Tularemia is caused by a bacterium found in animals, especially rodents, rabbits, and hares, and cats may become infected by preying on those animals or through tick exposure, according to the health district.

Infected cats may have a high fever, mouth ulcers, depression, enlarged lymph nodes, and behavioral changes that include not wanting to eat. Cats that have been outdoors and are showing these symptoms need veterinary care.

People can become infected by handling pets or wild animals with tularemia, or by being bitten by ticks or inhaling the organism, health officials said. Symptoms of the disease in people include sudden fever, chills, diarrhea, joint pain, muscle aches, cough, and weakness. If you have those symptoms, see your doctor for treatment.

Tips to avoid tularemia from the health district:

- Don't allow your cat to hunt outdoors.
- Make sure your cat is protected from tick bites.
- Report any large die-offs of rodents or rabbits to local animal control officials.
- Wear tick protection outdoors.
- Don't handle sick or dead animals.
- Cook wild game meat thoroughly before eating it, and use gloves when handling it beforehand.

(Source: ProMed Digest V2011 #428, September 16, 2011, edited)

Cranial Mass Causes Odd Turkey Behavior

In October 2011 district wildlife biologist Jeff Thompson submitted a hunter killed wild turkey to the Purdue Animal Disease Diagnostic Lab (Purdue ADDL). The hunter had observed the turkey "falling down and unafraid." A gross necropsy found a 5 mm mass at the base of the cranium.

Pair of skunks. Photo: Corel used with permission.

The final diagnosis was listed as "Histopathology indicates the intracranial mass was a granuloma. Microscopic granulomas were also found in other tissues. Most likely the cause is E. coli infection." The necropsy report suggested "the inflammation could have been initiated by trauma of undetermined origin and followed by secondary bacterial infection (E. coli) or septicemia. (Source: Purdue ADDL Case Report #S12-379, and Dean Zimmerman)

Oral rabies vaccine tested in WV

In September, USDA Wildlife Services distributed approximately 80,000 oral rabies vaccination

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Indiana Wildlife Disease News

A joint project between:

Indiana DNR
Division of Fish and Wildlife

and

USDA APHIS Wildlife Services
National Wildlife Disease Surveillance and Emergency Response Program

to provide information on wildlife diseases in Indiana and surrounding states.

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Submissions or Participation
If you would like to submit a wildlife disease related article, ideas, comments, or other information, please contact one of the editors.

We welcome individuals or agency representatives to act as reviewers or to provide assistance in the production of this newsletter. To assist, please contact one of the editors.

Providing information on wildlife diseases in Indiana and surrounding states

Indiana Department of Natural Resources Division of Fish and Wildlife

The mission of the Division of Fish and Wildlife is to professionally manage Indiana's fish and wildlife for present and future generations, balancing ecological, recreational, and economic benefits. Professional management is essential to the long term welfare of fish and wildlife resources, and providing for human health and safety. Communication between agency professionals and educating the public are important aspects of professional management.

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Indianapolis, IN 46204
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USDA APHIS Wildlife Services

NATIONAL WILDLIFE DISEASE SURVEILLANCE AND EMERGENCY RESPONSE PROGRAM

The mission of the National Wildlife Disease Surveillance and Emergency Response Program is to provide Federal leadership in managing wildlife disease threats to agriculture, human health and safety, and natural resources by assisting Federal, State, Tribal, and Local governments, private industry, and citizens with management of zoonotic and other wildlife diseases of concern.

USDA APHIS Wildlife Services
Purdue University, SMTH Hall, 901 W. State Street
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Phone: 765-494-6229

Midwest Wildlife Disease Update (Cont. from pg. 5)

baits in West Virginia to test the effectiveness of the vaccine on raccoons **and** striped skunks. This is the first time the new ONRAB® vaccine has been tested in the United States. To make the baits attractive, the blister packs containing the vaccine are coated with a sweet attractant that includes vegetable-based fats, wax, icing sugar, vegetable oil, artificial marshmallow flavor, and dark-green food-grade dye. According to the Centers for Disease Control and Prevention, about 90 percent of reported rabies cases in the United States are in wildlife. (Source: BOAH October 2011 newsletter).

Beef Cattle Traced to Indiana from South Dakota Bovine TB Case
Seven head of beef cattle traced to Indiana may have been exposed to the South Dakota bovine TB positive case. All seven animals have been identified and placed under quarantine. BOAH will be completing testing on these animals as soon as possible. Indiana's import requirements remain unchanged. More information about TB and this latest case can be found on the bovine tuberculosis page (http://www.in.gov/boah/2396.htm). (Source: BOAH website)

Column by D. Zimmerman, IDNR