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SCWDS BRIEFS

A Quarterly Newsletter from the
Southeastern Cooperative Wildlife Disease Study
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1998 HD Summary

Since 1980, SCWDS has conducted an annual mail survey of state fish and wildlife agencies and other selected sources to determine the activity of hemorrhagic disease (HD) in wild deer and other big game in the continental United States. HD is caused by either the epizootic hemorrhagic disease (EHD) or bluetongue viruses and is the most important infectious disease syndrome known in white-tailed deer. The Final Report for the 1998 Hemorrhagic Disease (HD) Surveillance Questionnaire has been completed and sent to all cooperators. Wildlife biologists and wildlife health scientists reported that 24 states had HD activity in a total of 327 counties. Deer die-offs were reported in Arkansas, Illinois, Iowa, Kansas, Kentucky, Missouri, Nebraska, South Dakota, Tennessee, Virginia, and Washington. Substantial death losses occurred in Illinois, Iowa, Kentucky, Missouri, Nebraska, and Tennessee. Several other states have reported focal losses or evidence of convalescent cases (Alabama, Indiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Texas, and Virginia).

Eighteen isolations of EHD virus serotype 2 (EHDV-2) were made at SCWDS from August to November 1998. Nine isolations were made from samples submitted from Missouri; 8 from white-tailed deer and 1 from a cow. Of the 8 Missouri deer, 2 were wild and 6 were captive. Isolations of EHDV-2 also were made from samples submitted from 3 white-tailed deer from Tennessee, 1 from Kansas, and 1 from Virginia. All of these were from free-ranging animals. The remaining isolations came from captive white-tailed deer and included 1 submission from Arkansas and 1 from Oklahoma. Presence of EHDV-2 virus genetic material in affected white-tailed deer, which is detected by the polymerase chain reaction (PCR) test, was reported for Iowa and Missouri by state and federal veterinarians who made additional investigations.

Last year (1998) will be remembered for the numerous cases of clinical disease in cattle that were attributable to EHDV. These cattle had fever, inappetence, lameness, and oral erosions. Several diagnostic investigations linked the problem in cattle with EHDV-2 by use of serology to demonstrate antibodies or the PCR test to show viral RNA in the blood. However, the only virus isolation from a bovine was the aforementioned EHDV-2 from a cow in Missouri. Wildlife managers should be prepared for increased speculation on the importance of deer to the health status of cattle as awareness of EHDV in cattle develops among farmers.

At this time, we would like to thank all of the people who participated in the HD survey and/or submitted virus isolates or samples for virus isolation during 1998. Copies of the Final Report are available by request to SCWDS. (Prepared by Victor Nettles and David Stallknecht)

HD Virus Isolation Support

SCWDS provides diagnostic support to our cooperating agencies through virus isolations of epizootic hemorrhagic disease virus (EHDV) and

bluetongue virus (BTV), which are the agents that cause hemorrhagic disease (HD) in deer. Since 1990, SCWDS has isolated over 70 EHDV-2 viruses as well as several EHDV-1 viruses and a BT-10 virus from samples submitted throughout the Southeast and Midwest. With the exception of last year's EHDV-2 isolation from a Missouri cow, all of these viruses have come from white-tailed deer.

Our virus isolation attempts involve inoculation of material from a suspect animal into cell cultures, and we utilize both baby hamster kidney (BHK_{21}) and cattle pulmonary artery endothelial (CPAE) cell lines. These cell lines are available from the American Type Culture Collection, Rockville, MD. With either cell line, two 7-day passages are done. During 1998, 16 of our samples were completed in both cell lines. For these 16 virus isolation attempts, EHDV-2 was isolated on the CPAE cell line in all cases, while the virus was isolated in BHK_{21} cells from only 4. Similar results were obtained during 1996 when 15 EHDV-2 isolations were made from cases in which both cell lines were utilized. Of these 15, virus was isolated from 14 attempts in CPAE cells but only 5 in BHK_{21} cells. Although it is apparent from the above results that the CPAE cell line offers a much more sensitive EHDV-2 isolation system than BHK_{21}, we recommend that both cell lines be used. Had not the BHK_{21} cell line been used in 1996, we would have missed an EHDV-2 isolation from Indiana and an EHDV-1 isolation from Tennessee. Considering the scarcity of EHDV-1 isolates during recent years, this would have been a significant loss. Another consideration in utilizing the CPAE cell line is the fact that this cell line has been reported to be persistently infected with bovine viral diarrhea virus. This may render this cell line unsuitable for use in some diagnostic laboratories and may complicate the use of CPAE-derived virus isolations for future experimental work.

We would like to thank all of you who submitted both virus isolates and samples for virus isolation during 1998. These isolations not only help to confirm specific outbreaks, but it is hoped that they also will provide the necessary biological material for future experimental work to truly understand the pathogenesis and epidemiology of these viruses.

With the 1999 HD season (late summer and fall) approaching, we would like to offer the following guidelines for submitting samples for virus isolation:

1. Call SCWDS or the state or federal diagnostic laboratory that you wish to use if you have a suspected HD case. Virus isolation protocols vary among laboratories, and it is often necessary for the laboratory to prepare cells for virus isolation in advance.
2. Tissues collected should include spleen and, if available from a live animal, unclotted blood. The blood should be collected in an anticoagulant such as EDTA, citrate, or heparin. Anticoagulant tubes can be obtained from veterinarians or medical laboratories. HD viruses can be isolated from other tissues including lung, lymph node, bone marrow, tongue, liver, and kidney, but if spleen is available this single tissue will suffice. Tissue samples should be kept as clean as possible and placed in a sealed plastic bag, such as a Whirl pac or Ziplock bag.
3. Keep all samples cold. **DO NOT FREEZE.**
4. Ship the sample overnight, using a well-insulated package and cold packs. Do not use wet ice for shipping. Always include basic information such as the case history and name and telephone number of the submitter. Again, consult the laboratory for specific instructions. At SCWDS, for example, we are unable to receive packages over the weekend.

Virus isolation is the only way to confirm a case of HD, but this can be a relatively slow process. ***Patience is required***; you will be notified of the results by telephone as soon as they are available. Virus isolation attempts usually are completed within 2-3 weeks, but depending on the individual virus and sample quality, the period required to

isolate and identify the virus may range from as short as 10 days to as long as 1 month. Hopefully, you will not see any HD this year, but if you do, SCWDS will be more than happy to continue to assist you in your diagnostic needs. (Prepared by David Stallknecht)

CWD Survey

This year, SCWDS mailed a questionnaire on chronic wasting disease (CWD) along with the annual Hemorrhagic Disease Surveillance Questionnaire. Respondents were asked to identify the numbers of cervids that had been identified as possible cases and were subjected to necropsy. The CWD Surveillance Questionnaire revealed the "dawning of awareness" about this disease among wildlife managers and animal health officials. Their responses indicated that only 26 animals had been examined last year because they fit the clinical picture of a CWD "target animal." A CWD target animal is defined as follows: ***The classic CWD "suspect" is a deer or elk 18 months of age or older that is emaciated and showing some combination of signs including abnormal behavior, increased salivation, tremors, stumbling, incoordination, difficulty in swallowing, excessive thirst, and excessive urination.*** Considering that the definition of a CWD "target animal" corresponds well with the generic description of a "sick deer," 26 cervids is too low. Hopefully, the survey drew attention to the need to do better.

Some good baseline data are being obtained. We learned that individuals in 13 states in addition to Colorado and Wyoming had collected brains from 1,830 normal wild cervids for surveillance. Fortunately, the results for wild cervids have been negative outside the known endemic area in Colorado and Wyoming. It is hoped that wildlife biologists and veterinary diagnosticians will make a greater effort to evaluate deer and elk that fit the "target profile" for CWD because this will be the most cost-effective method of surveillance. SCWDS would like to extend its thanks to the people who took the time to reply to the surveys. A copy of the Final Report is available upon request. (Prepared by Victor Nettles)

Another CWD Case in Nebraska

There has been a second confirmation of chronic wasting disease (CWD) in a captive elk in Nebraska. This elk was in a captive herd of approximately 10 animals in Cheyenne County, near Scottsbluff. It died on April 26, 1999, and the brain stem was submitted for testing. Histopathology and the tests for prion protein were positive. The ranch has been placed under quarantine by the State Veterinarian's Office, and a herd plan is being developed which will require the herd to be under close observation by personnel with the Nebraska Department of Agriculture. The Nebraska Game and Parks Commission will periodically check this herd and wild elk and deer in the vicinity for clinical signs of CWD. All captive elk on this newly diagnosed farm came from a single source herd in Colorado, which was the same source herd where the first CWD elk in Nebraska (April 1998) was diagnosed (SCWDS BRIEFS Vol. 14, No. 1). There is an investigation underway to determine if other Nebraska elk herds may have received elk from this Colorado herd as well. Fortunately, there were no movements of elk from the affected Nebraska herd since it was established in March 1997. Nebraska Game and Parks Commission personnel collected a wild elk that had been interacting with the captive elk through the fence; the brainstem from this wild elk was negative for CWD. Nebraska has strengthened its legislation on captive cervids, and in the future, the State Veterinarian will be requiring reporting of all cervid mortality and CWD testing on all captive elk over 16 months of age that die. (Prepared by Victor Nettles)

Human Lyme Disease Vaccine

SCWDS has received several calls from wildlife management agency administrators about the new human Lyme disease vaccine which recently has become available. SCWDS personnel are not qualified to become involved in medical

treatment of humans, and we do not have a position on the appropriate use of this vaccine. However, this is an important question because the safety of agency personnel is a valid consideration and there is a substantial financial cost associated with the vaccine.

The Centers for Disease Control and Prevention (CDC) recently published a brief report entitled *Recommendations for the Use of Lyme Disease Vaccine* (Morbidity and Mortality Weekly Report Vol. 48/No. RR-7, June 4, 1999). This report summarized the scientific information pertaining to the vaccine and gives guidelines for when it should be deployed. The human vaccine is called LYMErix®, and vaccination involves 3 injections at 0, 1, and 12 month intervals. The vaccine efficacy data given indicate that there was a 49% protection rate in preventing definite Lyme disease diagnoses after 2 doses and a 76% protection after 3 doses. No data are available on the duration of immunity and need for boosters.

The report explains that different subpopulations of humans have different risks of exposure. The CDC document states, "Most *B. burgdorferi* (Lyme disease organism) infections result from periresidential exposure to infected ticks during property maintenance, recreation and leisure activities." It also states, "Persons who engage in outdoor occupations [e.g., forestry, wildlife and parks, etc.] in endemic areas might be at elevated risk for acquiring Lyme Disease." In a cost-effectiveness estimate, it was stated that the "societal cost of vaccination [in this case the cost to the fish and wildlife agency] exceeds the cost of not vaccinating, unless the incidence of Lyme disease is greater than 1,973/100,000 people/year." The cost evaluation is based on the assumed vaccination cost of $100/person/ year. This incidence level is higher than the worst counties known in the endemic New England states. However, these figures are based on the general public's exposure rate, which would include many people who may never see a tick, and a wildlife biologist or field technician may be at higher risk. A Lyme disease Risk Map based on past experience is provided in the report. For the Southeast, only Maryland and Virginia have counties in the high or moderate risk ratings; everything else received a low or minimal risk rating.

In summary, the CDC's *Recommendations* does not seem to provide a complete endorsement for use of the vaccine, but instead, it provides the available scientific information so that people can make an informed choice. We would suggest that wildlife managers seek advice from their state's public health department, their agency's health insurance provider, and knowledgeable physicians before starting a vaccination program for their personnel. Consult the following CDC websites for more information:

www.cdc.gov/epo/mmwr/preview/mmwrhtml/rr4807a1.htm and
www.cdc.gov/epo/mmwr/preview/mmwrhtml/rr4807a2.htm (Prepared by Victor Nettles)

DEA Tightens Ketamine Use

The Drug Enforcement Administration (DEA) of the U.S. Department of Justice has published a Final Rule placing ketamine into Schedule IIIN of the Controlled Substance Act as a non-narcotic controlled substance. This Final Notice was published in the *Federal Register* (Vol. 64, No. 133, July 13, 1999) and became effective July 2, 1999. Wildlife biologists and veterinarians often use ketamine (trade names Ketalar, Ketajet, Ketaset, and Vetalar) to immobilize wild animals, and this new regulation will have an impact on how they deploy the drug in the future. The regulation was enacted because illicit human use of ketamine has become a serious problem. Street names for ketamine include "Special K" or "K." Major veterinary organizations are supportive of the regulation.

The new rules require that any person who manufactures, distributes, dispenses, imports, or exports ketamine must be registered with the DEA. This applies also to people who are engaged in research or conduct instructional activities with ketamine. Unless a person is registered with the DEA or has applied for registration before July 2, 1999, they must dispose of all stocks of ketamine according to

DEA guidelines. Alternately, the stocks can be transferred to a person already registered with the DEA to possess Schedule III drugs. Ketamine must be stored under appropriate security in conformance with DEA regulations, which means that it must be stored in a locked container. Furthermore, all packaged ketamine will be required to have the Schedule III controlled substance label by April 13, 2000. Stringent use and inventory record keeping are required, and prescriptions that have been issued will be limited to 5 refills and will not be valid after January 13, 2000.

What does this mean for wildlife biologists? Manufacturers and distributors of ketamine can only sell to persons holding a DEA Schedule IIIN registration, so without a registration number ketamine cannot be purchased. Persons who do research are eligible to apply for such a registration and, if registered, would be responsible for the drugs they purchase and administer. Without such a personal registration, the wildlife biologist must obtain the ketamine from someone who is registered, most likely a veterinarian acting as an agent on behalf of the fish and wildlife agency. Under the latter arrangement, the veterinarian is ultimately responsible for tracking the use of the drug even though the ketamine would be used in the field. Understandably, many veterinarians will be reluctant to take that responsibility. People at the DEA have suggested the possibility of a third option that would be similar to what is done for animal control shelters. Here, the state drug control agency must authorize the obtaining and dispensing of ketamine. After the state authorizes this activity, the state wildlife agency can apply to the DEA to be permitted to purchase and use the drug under a mid-level practitioner's registration. For more information, the wildlife biologist should contact the DEA Registration Section (1-800-882-9539 or 202-307-7255). (Prepared by Victor Nettles)

SCWDS Hosts ABLS Workshop

Avian Brain Lesion Syndrome (ABLS) is a term used to refer to a mysterious neurologic disease that has been diagnosed in bald eagles, American coots, and several species of ducks (SCWDS BRIEFS Vol. 12, No. 4; Vol. 14, No. 3; and Vol. 14, No. 4). ABLS previously was called Coot and Eagle Brain Lesion Syndrome (CEBLS). The cause is unknown but is suspected to be a toxin. The disease was first detected in a highly publicized die-off of bald eagles in Arkansas in 1994 but now has been diagnosed in bald eagles and American coots in Arkansas, Georgia, North Carolina, and South Carolina, as well as in several species of ducks at 1 location in North Carolina.

The original episodes of the disease were observed in Arkansas, and investigations were focused on a few reservoir lakes in that state that had affected birds. In the past 2 years, diagnoses were made in 3 additional southeastern states, and therefore, the hypothesis that ABLS was due to some point-source problem unique to Arkansas has been abandoned. Concomitant with this change in perspective has been the need to address this problem from a regional perspective as opposed to having a single state carry the lead. In May, the Arkansas Game and Fish Commission asked the Steering Committee of the Southeastern Cooperative Wildlife Disease Study (SCWDS) for assistance in promoting regional involvement, and SCWDS was encouraged to host a workshop to discuss ways for the states to proceed.

SCWDS will host a Workshop on Avian Brain Lesion Syndrome that will be held on Thursday, August 26, 1999, at The University of Georgia's Center For Continuing Education in Athens, GA. There will be 3 objectives for the Workshop:

1. To provide field biologists and others with basic information about ABLS.
2. To receive information from the U.S. Department of the Interior (Fish and Wildlife Service and/or Biological Resources Division of the U.S. Geological Survey) on their approach to further investigation (plans being formulated now).

3. Discuss ways that state fish and wildlife agencies can contribute to the investigation to help resolve the problem.

Invitations were sent to all state fish and wildlife agencies in the Southeast asking them to send their representatives to participate in this Workshop. ABLS has implications for both game and non-game birds, and because the cause is unknown, wildlife agencies must be prepared to face speculation from both the scientific sector and the general public. (Prepared by Victor Nettles)

Harold M. Smith -- 1942-1999

Dr. Harold M. Smith, Jr. (Lt. Col., Retired), former SCWDS Research Associate and graduate student, died July 25, 1999, as a result of complications following heart by-pass surgery. Harold was an active member of numerous professional and sportsmen's groups, and few could equal his enthusiasm and love for wildlife both from a vocational and an avocational perspective. His death is a great loss to the veterinary profession, the wildlife profession, and his many friends throughout the country. He will be greatly missed.

Harold graduated from The University of Georgia's College of Veterinary Medicine in 1966 and entered the U.S. Air Force Veterinary Corps shortly thereafter. His first assignment was at Pease AFB, NH. In 1969 Harold left the Air Force and entered private practice in Savannah, GA. He returned to military service in 1974 as an Air Force veterinarian stationed at Camp Pendleton, CA.

With his intense interest in wildlife medicine, Harold persuaded the Air Force to allow him to continue his educational pursuits, and in 1979 he entered a graduate program in wildlife parasitology with SCWDS. During his research on the parasites of wild swine for his Master of Science degree, Harold acquired the affectionate nickname "Boss Hog" from his coworkers at SCWDS.

While Harold was in the graduate program at SCWDS, the Air Force terminated its Veterinary Corps. Undaunted, Harold simply joined the Army Veterinary Corps to continue his career! After a couple of years at Ft. Gordon, GA, Harold realized a life-long dream of living in Alaska. He was assigned to Ft. Wainwright, AK, as an army veterinarian responsible for issues involving food safety, public health, and animal medicine. During his 5-year tour of duty in Alaska, much of his off-duty time was devoted to hunting and fishing in Alaska's wilds. His wife Gee and son Canada shared equally in his Alaska experience, just as they did in all aspects of his life. (Submitted by Col. Paul L. Barrows, U.S. Army Veterinary Corps, Ft. Sam Houston, San Antonio, TX)

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Information presented in this Newsletter is not intended for citation in scientific literature. Please contact the Southeastern Cooperative Wildlife Disease Study if citable information is needed.

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Recent back issues of *SCWDS BRIEFS* can be accessed on the Internet at SCWDS.org.

Recent SCWDS Publications Available

Below are some recent publications authored or co-authored by SCWDS staff. If you would like to have a copy of any of these papers, fill out the request form and return it to us.

____Abdy, M.J., E.W. Howerth, and D.E. Stallknecht. 1999. Experimental infection of cattle with epizootic hemorrhagic disease virus. American Journal of Veterinary Research 69(5): 621-626.

____Brandsma, A.R., S.E. Little, J.M. Lockhart, W.R. Davidson, D.E. Stallknecht, and J.E. Dawson. 1999. Novel *Ehrlichia* organism (Richettsiales: Ehrlichieae) in white-tailed deer associated with lone star tick (Acari: Ixodidae) parasitism. Journal of Medical Entomology 36(2): 190-194.

____Little, S.E., D.E. Stallknecht, J.M. Lockhart, J.E. Dawson, and W.R. Davidson. 1999. Natural coinfection of a white-tailed deer (*Odocoileus virginianus*) population with three *Ehrlichia*. Journal of Parasitology 84(5): 897-901.

____Lockhart, J.M. and W.R. Davidson. 1999. Evaluation of C3H/HeJ mice for xenodiagnosis of infection with *Ehrlichia chaffeensis*. Journal of Veterinary Diagnostic Investigation 11: 55-59.

____Stallknecht, D.E., E.W. Howerth, C.L. Reeves, and B.S. Seal. 1999. Potential for contact and mechanical vector transmission of vesicular stomatitis virus New Jersey in pigs. American Journal of Veterinary Research 60(1): 43-48.

____Van Brackle, M.D., R.L. Marchinton, G.O. Ware, V.F. Nettles, S.B. Linhart, C.D. Ruth, and L.O. Rogers. 1995. Oral biomarking of a supplementally-fed herd of free-ranging white-tailed deer. 1995 Proceedings of the Southeastern Association of Fish and Wildlife Agencies, pp. 372-381.

____Wlodkowski, J.C. and S.B Linhart. 1998. Raccoon acceptance of a new coated capsule bait. Wildlife Society Bulletin 26(3): 575-577.

____Little, S.E. and EW. Howerth. 1999. *Ehrlichia chaffeensis* in archived tissues of a white-tailed deer. Journal of Wildlife Diseases 35: 596-599.

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