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Concern for FMD Increases

As of April 30, 2001, foot-and-mouth disease (FMD) outbreaks had occurred in the United Kingdom (UK), The Netherlands, France, Republic of Ireland, Colombia, Argentina, and other countries. FMD also is present in South America and in some areas of Africa, the Middle East, and Asia. In the UK alone, more than 1,500 cases have been confirmed in livestock in the recent outbreak. Fortunately, the number of new cases detected has decreased to less than 10 per day from more than 40 daily in late March, and new cases have not been detected for several weeks in some of the affected countries. All wildlife tested in the UK so far has been negative for FMD, and wildlife has not been depopulated to stop spread of the disease.

The U. S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) has reminded livestock producers and veterinarians in the United States to be alert for disease conditions suspicious of FMD in susceptible animals and to take every precaution to promote biosecurity. APHIS, with assistance from SCWDS, has extended this notice to wildlife professionals because an FMD outbreak in the United States could be devastating to wild animals as well as domestic livestock.

Foot-and-mouth disease is a highly infectious viral disease that can severely affect all domestic and wild cloven-hoofed animals including cattle, swine, sheep, goats, and deer and other cervids. FMD virus does not readily infect humans. In affected animals, FMD causes blisters (vesicles) in the mouth and on the feet and teats, lameness, and excessive salivation. Young animals that are severely affected may die; however, chronic non-fatal cases are much more common. FMD can be confirmed only by laboratory tests.

The highly transmissible nature of FMD cannot be overemphasized. Infected animals are the source of the virus, but infectious viral particles may be carried in the wind or on virtually any animate or inanimate object. Virus may be found in aerosols, saliva, feces, urine, milk, semen, meat, and meat byproducts of infected animals. To prevent the spread of FMD virus in the UK and other parts of Europe, more than two million cattle, sheep and swine have been slaughtered, animal movement has been banned, livestock shows have been cancelled, and national parks and public footpaths have been closed to eliminate human traffic that may spread the virus. APHIS routinely restricts importation of animals and animal products that could spread FMD from FMD-infected countries, and these restrictions have been extended to include the European Union.

An outbreak of FMD in the United States could directly affect wild ruminants and feral swine by causing clinical disease or death. Equally significant is the probability that wildlife could be heavily impacted by control programs if wild animals were confirmed or suspected as reservoirs or disseminators of FMD virus. Following the 1924 outbreak of FMD in California livestock, more than 22,000 deer were slaughtered in the effort to eliminate the disease because deer with lesions suggestive of

FMD were found. The response to an outbreak of FMD in the United States will be dramatic and would be designated as a national emergency. Wildlife-related control measures to prevent the spread of FMD could potentially include local depopulation of susceptible wildlife, closure of hunting seasons in affected areas, prohibition of movement of wildlife or wildlife products, and restriction of access to public and private land in affected areas.

All wildlife professionals should be alert to the current FMD threat and be aware of the potential for wildlife involvement if FMD spreads to the United States. Unusual mortality of any cloven-hoofed wildlife should be reported immediately to the State Veterinarian and the APHIS Area-Veterinarian-in-Charge, who will assist with the diagnostic investigation. (Prepared by Joe Corn and John Fischer)

Keep FMD out of America!

Foot-and-mouth disease (FMD) is endemic in many countries around the world, but new outbreaks are occurring in areas that have not been affected for decades. Fortunately, this severe disease of cloven-hoofed livestock and wildlife has not been present in the United States since 1929 because of the constant vigilance and strict importation standards set by the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS).

Due to the recent outbreak in the United Kingdom and other countries, APHIS has expanded to keep FMD from entering the United States. The following new regulations were implemented:

- Temporary prohibition of importation of all swine and ruminants and their by-products from the European Union.
- Importation of used farm equipment is temporarily banned from all areas under FMD import restrictions.

In addition to the emergency measures, APHIS also has increased action in several other areas to help ensure that FMD does not gain entry into our borders.

- APHIS has dispatched teams of veterinarians and other animal health personnel to assist the United Kingdom in bringing the current epidemic under control.
- More than 450 specially trained veterinarians, including APHIS employees, military personnel, and state and federal employees, are working with state and local agriculture officials to investigate any reports of possible FMD occurring in the United States.
- The APHIS Emergency Management Operations Center (EMOC) has been activated to answer technical and consumer/ traveler questions regarding FMD (technical questions 1-800-601-9327, consumer/ traveler hotline 1-866-723-4827). APHIS also has information available on an improved web site (www.aphis.usda.gov).
- Increased numbers of APHIS inspectors are posted at America's borders, airports, and ports to watch for illegal entry of animals and animal by-products that might harbor the FMD virus.
- APHIS has emergency operations plans in place to respond to the potential spread of FMD to the United States.

APHIS asks that everyone help prevent the spread of FMD to the United States by practicing the following basic preventive measures that have always been in effect.

- Travelers entering the United States from all countries must declare all visits to farms or livestock facilities on their U.S. Customs Declaration Form.
- International travelers must report food items and other material of plant or animal origin in their possession upon entering the

U.S. Mailing animal products from countries under import restrictions is illegal.

- Travelers should avoid farms, sale barns, laboratories where animals are housed, packing houses, zoos, and fairs for five days prior to returning from an affected country.
- All travelers from FMD-affected countries must avoid contact with livestock and wildlife for five days after returning to the United States.
- Travelers should clean their clothes, shoes, luggage, and other personal belongings before returning to the United States or as soon thereafter as possible.
- Persons transporting dogs and cats from an affected country into the United States should rid the animal of excess dirt and make sure that bedding material is free of straw, hay, or other natural bedding materials that might harbor the virus. As with people returning to the United States, it is advisable to keep pets separate from livestock for five days after returning as well as bathe them as soon as they are back in the United States.

If all of the recommended procedures are observed, the chance of the FMD virus entering the U.S. remains small. However, it is extremely important for everyone to follow APHIS' travel and importation guidelines in order to prevent FMD from entering the United States. (Prepared by Christine Budke and John Fischer)

APHIS Policies for Wildlife in an FMD Emergency

On April 20, 2001, the International Association of Fish and Wildlife Agencies (IAFWA) hosted a meeting to discuss wildlife issues regarding foot-and-mouth disease (FMD) and to maintain open communication between animal health and wildlife management agencies. The meeting was attended by individuals representing state and federal wildlife management and animal health agencies, SCWDS, and wildlife-oriented non-governmental organizations.

Dr. Alfonso Torres, Deputy Administrator for Veterinary Services, U.S. Department of Agriculture (APHIS), discussed APHIS policies regarding wildlife in a potential FMD emergency. APHIS believes that FMD most likely would be self-limiting in wildlife in the long term. The most efficient method of controlling FMD will be immediate removal of infected and exposed domestic animals to prevent transmission of FMD to other livestock or wildlife. Dr. Torres stated that APHIS does not have plans to systematically kill or depopulate wildlife to control FMD. However, in the short term preventing transmission of FMD between domestic and wild animals will be critical. Immediate surveillance of susceptible free-ranging species, primarily wild ruminants and feral swine, potentially exposed to infected livestock is warranted to determine whether FMD has spread to wildlife. This will entail lethal collection of these species for diagnostic testing. Additionally, local reduction of the density of susceptible wildlife populations in an infected zone would be employed to prevent the spread of FMD if wildlife were identified as a risk factor. Long-term observation in the area also is warranted to ascertain that FMD has not become established in wildlife. Involvement of the state and other appropriate wildlife management agencies is essential in planning and implementing wildlife-related work in an emergency response. These policies and procedures may change as additional information becomes available through research or while monitoring an outbreak.

The need to develop additional information regarding FMD in wild species was identified. Funds are being sought for experiments to evaluate clinical disease and viral shedding in native North American species, such as bison and pronghorn. Additional research projects

are needed to assess the potential for non-susceptible wild species, such as birds, to serve as mechanical carriers of FMD virus.

Dr. Torres also discussed the concept of "compartmentalization" of animal diseases with respect to international trade. In short, the presence of a particular disease in free-ranging wildlife may not affect the "disease free" status of a country providing there is no apparent transmission of the disease to domestic livestock. The implication of this policy is that there would be no economic-based pressures to depopulate wild animals to control a disease that is not affecting domestic animals, provided that disease transmission between wild and domestic animals is mitigated. Regardless, the ultimate goal will be eradication of the disease from all animals within the country, whether domestic or wild.

The recent meeting reaffirmed the network that exists between animal health and wildlife resource agencies. For decades, state and federal wildlife management agencies have worked with APHIS to protect the health of wild and domestic animals. In the early 1980s, Memoranda of Understanding were signed between APHIS and the wildlife management agencies of all 50 states, as well as the U.S. Department of the Interior, to formally acknowledge the cooperative effort required to eradicate or control certain animal diseases. There is open communication between APHIS and wildlife agencies through the Fish and Wildlife Health Task Force of the IAFWA, as well as through a Cooperative Agreement between APHIS and SCWDS. Under this Agreement, SCWDS serves as liaison between animal health and wildlife agencies to provide information, training, and recommendations to prevent or control animal diseases via a network of wildlife liaisons representing 52 state and territorial wildlife agencies.
Veterinary Services, through SCWDS, currently is developing additional guidelines for wildlife aspects of the emergency response to a highly contagious animal disease. These guidelines will be added to a revised document originally made available on March 30, 2001, and will be disseminated to all state wildlife resource agencies. The original guidelines and other information regarding FMD are available at the APHIS web site (www.aphis.usda.gov). (Prepared by John Fischer)

What if FMD Hits?

While every effort is being made to keep foot-and-mouth disease (FMD) out of the United States, state and federal agencies are continuing to prepare for the worst. In the event that an FMD outbreak does occur, state and federal agencies will implement their emergency response plans in order to contain and then eradicate the disease. This emergency response plan will entail a huge cooperative effort involving many areas of expertise, including diagnosis and surveillance, quarantine and biosecurity, epidemiology, depopulation and disposal, cleaning and disinfecting, and public information. The following is an abbreviated summary of guidelines for fish and wildlife agencies if FMD occurs in the United States. SCWDS developed these guidelines in cooperation with Emergency Programs, Veterinary Services, Animal and Plant Health Inspection Service (APHIS), U.S. Department of Agriculture. Since 1979, SCWDS has conducted surveillance and training programs regarding the wildlife aspects of foreign animal diseases (FAD), and has participated in the response to FAD introductions into the United States under a Cooperative Agreement with APHIS.

If FMD is confirmed in the United States, the affected state(s) will initiate immediate measures in response to the outbreak. In addition, a declaration of an emergency by the Secretary of Agriculture would activate the Regional Emergency Animal Disease Eradication Organization (READEO). The READEO will provide technical support for the state emergency response system. The READEO is comprised of state and federal

personnel who have been trained to perform pre-assigned tasks and are prepared to mobilize immediately. This response includes a READEO Wildlife Section. The Wildlife Section will be led by a USDA-appointed Wildlife Officer and a State Wildlife Liaison Officer (SWLO). The goal of the Wildlife Section is to protect both domestic animals and wildlife through prompt disease eradication. A SWLO has been appointed to the READEO by each of the 52 state and territorial Fish and Wildlife Agencies.

Objectives of the Wildlife Section include determining the risk for wildlife to maintain or disseminate FMD and the reduction or elimination of such risk. This risk will be dependent upon the distribution, density, and biology of wildlife species present, the level of exposure of susceptible wildlife to infected domestic animals, and the environmental conditions in the area. It will be critical to rapidly assemble all current information regarding wildlife in the affected area. Depending on the species present and their potential exposure to FMD, the Wildlife Section will determine if surveillance is necessary.

Surveillance of wildlife for FMD in the vicinity of an infected premise will be based on the prevailing local circumstances. Surveillance will include FMD-susceptible species to determine if wildlife at a premise is infected and if the virus is spreading away from the premise. Surveillance also may be conducted on non-susceptible species such as birds to evaluate their potential role as mechanical carriers of virus. Because FMD is highly infectious, all persons participating in Wildlife Section activities must officially be part of the Task Force and will work under strict biosecurity guidelines. In addition, surveillance and disease control programs must be conducted within federal, state, and local laws.

If wildlife is considered a risk factor for FMD dissemination in the outbreak, programs will be initiated immediately to prevent contact between infected livestock, wildlife, and uninfected domestic animals. Containment of free-ranging wildlife to prevent the spread of disease is extremely difficult. It may be deemed necessary to reduce local wildlife populations to a density at which FMD transmission is unlikely. This would require immediate and aggressive actions that will adversely affect local wildlife. However, the short-term and localized impact must be weighed against the long-term and widespread consequences of allowing FMD to persist in wildlife, including the potential for considerable wildlife mortality from FMD.

As has been seen in the United Kingdom, control and eradication of FMD can affect public access to affected areas. The Wildlife Section will identify hunting seasons and wildlife-associated activities occurring within affected areas. This information will be used to provide recommendations for hunting season closures, as well as restrictions to public land access, in order to halt the spread of FMD. It is highly probable that private landowners with animals at risk also will close their property. Public support for these and other eradication activities will be essential for success.

State Fish and Wildlife Agency personnel currently are participating in state emergency planning activities. SWLOs are ascertaining immediate availability of wildlife distribution and density information, scientific collecting permits, personnel, and equipment to conduct the above-listed activities. For additional information please contact SCWDS at 706-542-1741 or APHIS at 1-800-601-9327 or see the APHIS web site at www.aphis.usda.gov. (Prepared by Joe Corn and John Fischer)

No Time for Complacency!

"If it looks like a duck, walks like a duck, and quacks like a duck…it must be a duck!" This old adage can be useful in many situations where the odds strongly favor the probability that what is seen truly is a "duck." But, there is

another adage that declares, "Assumption is the mother of all foul-ups!" Not all things are what they seem, and the similarity between foot-and-mouth disease (FMD) and hemorrhagic disease (HD) in white-tailed deer is a good example.

The Annual SCWDS Hemorrhagic Disease Surveillance Questionnaire has revealed that HD has occurred in free-ranging deer in multiple states every year since the survey began in 1980. Thus, the odds strongly favor that we will see HD again somewhere in 2001. Most readers are familiar with HD, and many can rapidly recall animals they have seen or the photographs of HD lesions shown in SCWDS's *Field Manual of Wildlife Diseases in the Southeastern United States* or the SCWDS HD brochure. But there is a hazard to this familiarity: experimental FMD infections in white-tailed deer caused oral, foot, heart, and rumen lesions that are visually indistinguishable from HD lesions!

The scale of the FMD outbreak in Europe and its presence on other continents has heightened public awareness of the risk that FMD represents to the United States. Should FMD enter the United States, we do not know how it will behave in our wildlife populations, although all cloven-hoofed animals must be considered vulnerable. We know that white-tailed deer are fully susceptible to FMD, based on a small experimental trial; we also know that black-tailed deer likely were involved in the 1924 FMD outbreak in California. The California episode was disturbing because the lesions were not discovered in deer until the outbreak in cattle was 145 days old! Can we afford to learn that we have FMD in wildlife after we have been fighting the disease for almost five months?

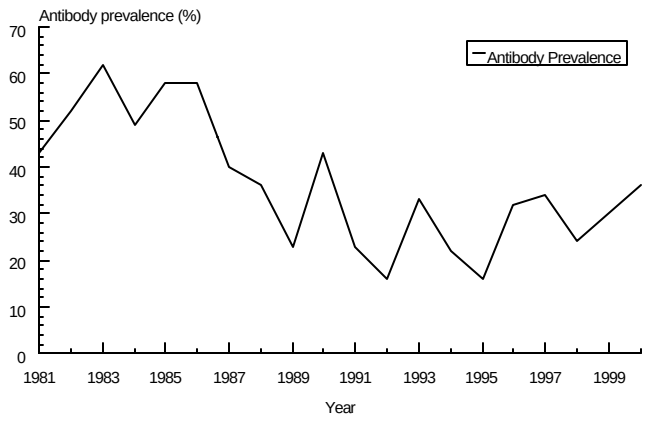
It is unlikely that the first case of FMD seen in the United States will be in a wild ungulate. But if it is, the sick wild animal probably will not exhibit the classical vesicular lesions (blisters) of FMD that occur on the mouth and feet. These vesicles are fragile and transient, and it is more likely that the affected deer, elk, pronghorn, or other animal will have progressed beyond the vesicular stage to having erosions, which will mimic HD! For this reason, wildlife managers must make the extra effort to get professional diagnostic assistance on suspected cases of HD during the upcoming year. Assistance can be obtained by contacting SCWDS, your State Veterinarian's office, State Veterinary Diagnostic Laboratory, or APHIS' Area-Veterinarian-in-Charge for your state. (Prepared by Vic Nettles)

VS Persistence on Ossabaw Island

Georgia's Ossabaw Island has the distinction of being the only confirmed enzoootic focus of the New Jersey serotype of vesicular stomatitis virus (VSV-NJ) in the United States, and the barrier island has served as an outdoor laboratory for research on the epidemiology of VSV-NJ since the early 1980s. VSV-NJ activity on Ossabaw Island initially was detected in the 1960s by serologic testing of feral swine and white-tailed deer. But it was not until 1983 that the virus was isolated from a feral pig with vesicular lesions. From then through the early 1990s, VSV-NJ was isolated on several occasions from the sand fly vector (*Lutzomyia shannoni*) and from additional feral swine, with and without clinical disease.

White-tailed deer (WTD) represent the only species at this site that have been under continued surveillance since 1981. WTD have proven to be a reliable indicator of VSV-NJ activity, despite the fact that naturally occurring vesicular stomatitis has never been observed in WTD, and there have been no isolations of VSV-NJ from free-ranging WTD. From 1981 through 2000, SCWDS has tested blood samples from more than 1,800 hunter-killed WTD as shown on the Figure below, and seropositive deer have been detected every year.

Antibodies to VSV-NJ in white-tailed deer
Ossabaw Island, GA 1981-2000



The prevalence of antibodies to VSV-NJ appears to be decreasing, but it is possible that this represents variations in sampling rather than an actual decrease in activity. For example, it is known that VSV-NJ is associated with the old-growth maritime forest on Ossabaw Island, and since 1981 the area under surveillance has been enlarged to include less favorable VSV-NJ habitats due to expansion of the public deer hunting zone.

These data indicate that VSV-NJ is alive and well on Ossabaw Island, and its continual detection solely through wildlife surveillance has important implications to developing integrated animal disease detection systems. SCWDS work on Ossabaw Island clearly demonstrates that important livestock pathogens, such as VSV-NJ, can persist in the absence of domestic animal hosts and, that in such areas, detection of the virus would escape conventional surveillance systems based on domestic animal species alone. This focus of VSV-NJ infection would still be unknown if active surveillance directed at wildlife had not taken place. This observation could have relevance to other diseases of domestic animal. (Prepared by Dave Stallknecht)

More TB in Michigan

The number of counties and wildlife species in which bovine tuberculosis (TB) has been found continues to increase in Michigan. Bovine TB has been recognized as endemic in free-ranging white-tailed deer in the state's northeastern lower peninsula since 1994. Surveillance of hunter-killed deer in 2000 detected an infected white-tailed deer in Emmet County for the first time, and the number of Michigan counties in which deer with TB have been found now stands at 12. Bovine TB also was confirmed for the first time in a hunter-killed wild elk in Michigan in 2000. Surveillance of other Michigan wildlife has detected bovine TB in 13 coyotes, 4 black bears, 4 bobcats, 2 raccoons, 2 opossums, and 2 red foxes.

Surveillance of Michigan wildlife for bovine TB continues. To date, more than 64,000 wild white-tailed deer have been examined and 340 positive animals have been found. Nearly all of these animals were submitted as part of a voluntary program in which heads from hunter-killed deer were examined by personnel from the Michigan Department of Natural Resources, Michigan State University, and the U.S. Department of Agriculture. More than 800 hunter-killed elk and numerous wild carnivores and omnivores also have been examined.

Continued surveillance of domestic livestock in Michigan recently detected bovine TB in three beef cattle herds in Alpena County and one in Alcona County. These are two of four counties, parts of which make up the "high risk area" where bovine TB has been found in livestock. This makes a total of 2 dairy herds and 14 beef herds to test positive as of May 14, 2001. Owners are given the choice of depopulating each entire herd or becoming involved in a test-and-remove program. The Michigan Department of Agriculture has conducted more than 600,000 individual animal tests for TB in cattle, goats, bison, and privately owned cervids. (Prepared by John Fischer)

CWD in Saskatchewan Mule Deer

Chronic wasting disease (CWD), a transmissible spongiform encephalopathy of deer and elk, recently was diagnosed in a two-year-old hunter-harvested mule deer in western Saskatchewan, Canada. Prior to this, CWD had been detected only in free-ranging cervids from an endemic focus in adjoining areas of northeastern Colorado, southeastern Wyoming, and western Nebraska (see SCWDS BRIEFS Vol. 16, No. 4). In 1997, the disease also was detected in captive elk in South Dakota. Subsequently, CWD-positive captive elk herds have been identified in four additional states (CO, MT, NE, and OK) and Saskatchewan, Canada.

Last fall, Saskatchewan Environment Resource Management personnel collected brain samples from approximately 1,400 free-ranging elk and deer for CWD testing. The positive mule deer is the only wild cervid in Canada in which CWD has been detected. Test results are pending for other deer harvested in the area in which the positive mule deer was taken. Additional work will be necessary to determine if the positive mule deer represents a new endemic focus of CWD in free-ranging cervids or spillover from disease in CWD-positive farmed elk. (Prepared by Joe Gaydos)

HD 2000

Reports for the 2000 Hemorrhagic Disease (HD) Surveillance Questionnaire have been received from 39 states, and a Preliminary Report has been issued to all contact persons for final verification. Activity that fits at least one of the four HD criteria (late summer/ early fall death losses, compatible necropsy findings, isolation of an HD virus, or chronic HD lesions in hunter-killed deer) has been reported by 21 states. HD death losses that were confirmed by virus isolation and/or polymerase chain reaction (PCR) tests occurred in 11 states (AR, CA, GA, ID, KS, MD, NE, NC, SC, TX, VA). Epizootic hemorrhagic disease virus serotype 2 (EHDV-2) was the most common virus isolated. EHDV-1 was isolated in California, and both EHDV-1 and EHDV-2 were found in Texas. North Carolina had one deer infected with both EHDV-2 and bluetongue virus serotype 13. In addition, California had a small episode of the unrelated deer adenovirus infection in one county. Notable mortality was reported in CA, GA, ID, KS, KY, MD, MT, NE, NC, ND, and SC. A final report will be prepared after the comments are received from the participating biologists and veterinarians. (Prepared by Vic Nettles)

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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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