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Pseudorabies in Swine

Pseudorabies, also called Aujeszky's disease and abbreviated PRV, is an often fatal disease affecting most species of domestic and wild animals. The disease, caused by a herpes virus, is characterized by severe itching and self-mutilation in some species, but rarely in swine.

Until 1974, pseudorabies in the United States was considered a disease of low virulence and low economic importance except in certain areas of Indiana. Since that time its prevalence has increased markedly, especially in Illinois, Indiana, and Iowa. In 1978 there were over 700 laboratory-confirmed outbreaks of pseudorabies in Iowa; that year fewer than 40 outbreaks were confirmed in Minnesota. However, if pseudorabies continues to spread as it has during the last 3 years, it will become a major disease of Minnesota swine.

CLINICAL SIGNS

Clinical signs of pseudorabies vary with age of pigs affected. Pigs less than 3 weeks old exhibit sudden death with few, if any, other clinical signs. Careful observers may notice some pigs with a fever exceeding 105° F, dullness, inappetence, vomiting, diarrhea, weakness, incoordination, and convulsions. When vomiting and diarrhea occur, pseudorabies closely resembles transmissible gastroenteritis (TGE). In pigs less than 2 weeks of age, death losses from pseudorabies frequently approach 100 percent. When baby pigs are infected in late pregnancy, they usually die prior to 2 days of age. Other pigs become infected immediately after birth and exhibit clinical signs within the first 2 days of life; they usually die before they reach 4 days of age.

After about 3 weeks of age, pigs usually develop some resistance to the disease and fewer may die. Virulence varies, making it difficult to predict the mortality rate associated with any given outbreak. On some farms the disease has been so virulent that market age and breeding age animals have died. Other farms have virtually no death losses during an outbreak.

Fever is a prominent clinical sign of pseudorabies in growing pigs—usually followed by loss of appetite, listlessness, labored breathing, trembling, and occasionally marked incoordination, especially in the hind legs. Death usually is preceded by convulsions. Vomiting may or may not be present. Respiratory tract involvement includes sneezing, coughing, and nasal discharge. Infected pigs which recover often are slow to reach market weight.

In finishing pigs the disease usually is not severe. When signs of PRV occur, they are similar to those for growing pigs.

Pseudorabies can cause major losses in the breeding herd. Sows infected in early stages of pregnancy may return to heat because embryos have died and have reabsorbed. Sows infected in the middle of pregnancy usually abort or give birth to mummified fetuses. Sows infected late in pregnancy abort or give birth to weak pigs, stillborn pigs, or pigs exhibiting congenital tremors (i.e., shaker pigs).

DIAGNOSIS

The diagnosis of pseudorabies usually is made presumptively on the basis of herd history, characteristic signs, and the absence of postmortem lesions. Because of the inconsistency of gross pathologic lesions, the diagnosis always should be confirmed by a laboratory. Laboratories use a fluorescent antibody test to determine the presence of the virus; or they can attempt to isolate the virus in cell cultures from fresh tissues—especially from the tonsil, lung, liver, spleen, and brain. Since virus isolation takes about 10 days, it is not as useful as the more commonly used fluorescent antibody test.

The presence of the virus within a herd also can be determined by a test on the serum of the pig, called a *serum neutralization test*. The antibodies detected by this test appear on about the seventh day after initial infection and may persist in a pig almost indefinitely. The detection of these antibodies in a blood sample from a pig is very strong evidence that the pig has been infected with the disease at least some time in the past. The absence of antibodies on the other hand may indicate that the animal has not been infected or that it may be in very early stages of the disease. When there is question about an animal, the test should be repeated to see if antibody levels are rising. A rising antibody level from one test to the second indicates that active pseudorabies infection is present.

The serum neutralization test requires approximately 10 days to complete and is considered a reliable test for detection of antibodies within a herd. There is some controversy about the reliability of the test for one animal; however, it is currently the best test available for detection of exposure to pseudorabies without sacrificing the animal.

One shortcoming of the serum neutralization test is its inability to distinguish between the antibodies caused by natural infection and the antibodies resulting from vaccination. *Since a negative serum neutralization test currently is required before breeding animals can be moved to other states, seedstock producers must give careful consideration to the use of the vaccination.*

Serum submitted for the neutralization test must be collected in clean, sterile tubes and submitted in packed ice. If the serum contains hemolyzed blood or is contaminated with bacteria, the serum neutralization test is unreliable. A common mistake is to send the serum sample in brucellosis tubes or other recycled tubes that have been washed with detergents or other chemicals that prove toxic to the cell culture system used in the serum neutralization test.

TRANSMISSION

Pseudorabies virus is spread within a herd by direct contact from pig to pig. Nasal discharge and saliva contain the virus. Drinking water, bedding, and other objects may become contaminated. Care must be taken that clothing, boots, and equipment are not responsible for transmission of the virus from one group of pigs to another.

Dogs and cats are very susceptible to pseudorabies and usually become infected through contact with infected swine. Raccoons, skunks, and mice also are susceptible; rats are more resistant. There is circumstantial evidence that animals other than pigs are responsible for the short-term, short-distance spread of pseudorabies within the United States. Most of these animals die within several days after infection, however, which limits the time during which they are infectious.

Recovered pigs may remain carriers of the virus. Research from Hungary suggests that approximately 3 percent of pigs carrying antibodies to pseudorabies also shed the virus. These pigs, transported as feeder pigs or breeding animals, probably are responsible for the long-distance transmission of pseudorabies.

IMMUNITY

When pigs recover from pseudorabies they develop an active immunity which may last several years. This immunity can be passed from an immune sow to her offspring through the colostrum and can provide protection for up to 5 weeks.

Serum from immune pigs can be collected and used to protect baby pigs against pseudorabies for a period of several weeks. If the antipseudorabies serum contains high levels of antibodies and if administered to baby pigs prior to infection with the virus, death loss can be reduced. Studies in Illinois indicate baby pig survival increased 25 percent in infected herds using the commercially prepared antiserum.

VACCINATION

In June 1977, the USDA issued a federal license for the manufacture and sale of two pseudorabies vaccines currently available on a prescription basis from veterinarians. Each state is responsible for establishing limitations on vaccine usage. The Minnesota Livestock Sanitary Board has decided that veterinarians in this state must keep a record of the usage of all doses of the vaccines.

The appropriate place to use the vaccines is in the breeding herd. The vaccines should confer protection in both the breeding animals and will passively protect baby pigs through the colostrum for up to 3 weeks, the time during which highest death losses can be expected.

Vaccinated pigs do not shed the vaccine virus and do not cause adjacent unvaccinated pigs to become positive to pseudorabies.

CONTROL

Because pseudorabies is less prevalent in Minnesota than in adjacent states, the primary challenge to Minnesota pork producers is to keep it out. Wherever possible refrain from purchasing animals that originate in or near pseudorabies outbreaks. Always suspect that incoming boars may be a source

of pseudorabies infection. Request that animals from another farm be tested and found negative prior to movement to your farm. For increased protection, maintain the boars in absolute quarantine for 2 weeks after they reach your farm; then retest. Only after two consecutive negative tests should the boars be allowed to contact other pigs on your farm.

Also suspect that incoming feeder pigs are a source of pseudorabies. Because of pseudorabies, pork producers have one more reason not to purchase and feed feeder pigs where a farrowing operation is also conducted. Pseudorabies may not cause serious losses in the feeder pig feeding unit, but if it spreads to the breeding herd in the farrowing house, major losses can be expected. In the most severe pseudorabies outbreaks, producers have lost up to 4 months of production. Nearly all pigs under 2 months of age have died, and nearly all litters in the last half of gestation have aborted or delivered mummified or weak pigs.

If a pseudorabies outbreak occurs in your community, be on guard for possible vectors of disease transmission—dogs, cats, and other exposed animals. Pigs that die from pseudorabies should be deep buried or burned. Recovered pigs from infected farms should be sold directly to market for slaughter. Transport vehicles should be thoroughly disinfected before contacting other pigs.

When pseudorabies is diagnosed on a farm, the pork producer must make some rapid decisions. One plan of action is to isolate infected pigs from all other pigs on the farm. An alternative is to encourage the spread of pseudorabies throughout the farm, so that recovered pigs acquire natural immunity and production returns to normal as soon as possible. Another alternative is to begin an immediate vaccination program.

PUBLIC HEALTH IMPLICATIONS

Pseudorabies does not infect humans and is not related to rabies. Pseudorabies-infected pork or pork from pseudorabies-infected herds is satisfactory for human consumption provided the animal does not exhibit a fever or obvious signs of disease at the time of slaughter.

Strict regulations regarding movement of swine and wise use of the vaccines should reduce major losses from pseudorabies. Perhaps an eradication program soon will be possible. Most scientists who have studied pseudorabies consider it an eradicable disease, if sufficient dollars and manpower are available.

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