



pork industry handbook

COOPERATIVE EXTENSION SERVICE • MICHIGAN STATE UNIVERSITY

Pseudorabies (Aujeszky's Disease, Mad Itch)

Authors

C. John Maré, University of Arizona
A. V. Zierke, Hubbard, Iowa
Don P. Gustafson, Purdue University

Reviewers

Robert D. Glock, Iowa State University
Willard Korsmeyer, Beardstown, Illinois
Robert Bennett, Linden, Indiana

Introduction and History

Pseudorabies (Aujeszky's disease) is an acute, frequently fatal disease affecting most species of domestic and wild animals. The disease is caused by a virus of the Herpesvirus group and is characterized by a variety of clinical signs, those involving the nervous and respiratory systems being particularly prominent. Severe itching with self-mutilation is seen in most species, but rarely in swine.

The disease was first recognized as an infectious disease of cattle and dogs in Hungary by Aujeszky in 1902. He succeeded in transmitting the disease to rabbits. It soon became evident, however, that swine were the reservoir hosts of the virus, and that pigs could also die of the disease.

In Europe pseudorabies has now been recognized for many years as an important cause of death in swine of all ages, and also as a cause of abortion. In the U.S.A. the disease until recently was considered to be important only as a cause of death in baby pigs, and occasionally in cattle, dogs, and cats. It has become evident, however, that pseudorabies has not only become more prevalent in the U.S.A. as a serious disease of swine, but that the viruses present in this country are capable of causing a wide variety of clinical manifestations, including death in newborn and occasionally in adult swine, and embryonic or fetal death in pregnant swine. The disease is now widespread and of considerable economic importance in the United States.

Clinical Signs

Pigs Less than 3 Weeks Old. In baby pigs the disease may be characterized by sudden death with few if any

clinical signs. More often death is preceded by fever which may exceed 105 F., dullness, loss of appetite, vomiting, weakness, incoordination, and convulsions. When vomiting and diarrhea occur, the disease closely resembles transmissible gastroenteritis (TGE). In pigs less than 2 weeks old death losses frequently approach 100%. Baby pigs may become infected before birth and die within 2 days after birth, occasionally after violent shaking and trembling (shaker pig syndrome, myoclonia congenita). Piglets infected immediately after birth may have clinical signs within the first 2 days of life and usually die before they are 5 days old.

Pigs 3 Weeks to 5 Months Old. After 3 weeks of age, pigs become more resistant to the disease. Death losses may decrease from about 50% in pigs exposed when 3 weeks old to less than 5% in pigs exposed when 5 months old. Death losses, however, vary with different strains of the virus and in different environmental situations; even in grown pigs, severe death losses occasionally occur.

Fever is a prominent clinical sign in these growing pigs and is usually followed by loss of appetite, listlessness, labored breathing, trembling, and eventually marked incoordination, especially of the hind legs. Death is usually preceded by convulsions. Involvement of the respiratory tract with sneezing, rubbing of the nose, and coughing may occur early in the disease. Clear to yellowish nasal discharges may be seen. Infected pigs that recover will usually have lost condition and may be slow to reach market weight. Stunting is commonly seen in recovered pigs.

Mature Pigs. The disease in adult pigs is usually not severe, but with some strains of pseudorabies virus deaths

may occur in grown pigs. The disease is usually characterized by fever, dullness, and loss of appetite, and may be followed by respiratory signs such as nasal discharges, sneezing, nose rubbing, coughing, and difficulty in breathing. Nervous signs such as trembling, incoordination, and itching occasionally occur, and blindness may rarely follow a pseudorabies infection. Vomiting and diarrhea or constipation may be seen.

Sows infected in the early stages of pregnancy may return to heat following the death and resorption of their embryos. Sows infected in middle pregnancy may eventually abort mummified fetuses, whereas sows infected late in pregnancy often abort or give birth to weak, shaker or stillborn pigs. Piglets infected immediately before birth usually die within 2 days.

Postmortem Lesions

No gross lesions characteristic of pseudorabies are consistently found. Small greyish-white spots may occur in the livers and spleens of pseudorabies-infected young pigs, and the blood vessels of the meninges may be engorged. Only microscopic examination of these and other tissues will reveal whether these lesions are related to the disease.

Immunity

Recovery from pseudorabies is followed by strong, active immunity which may last for years. The passive immunity transmitted from an immune sow to her offspring through the colostrum can protect the piglets for 5-10 weeks, after which they are fully susceptible. The passive immunity may, however, be too weak to protect the piglets, and thus the offspring of some immune sows may also die of pseudorabies.

Serum from hyperimmune pigs can be collected and used to protect baby pigs against pseudorabies for a period of several weeks. If this anti-pseudorabies serum contains high levels of antibodies, and if it is administered to baby pigs prior to or within 6 hours after infection with the virus, death losses can be markedly reduced. This serum is not a vaccine, and it is not available except as an experimental product.

Live-virus vaccines which confer fairly adequate long-term immunity have been widely used with varying success in Europe, but not in the U.S.A. Inactivated vaccines have been made but have usually given very poor protection. Although the live-virus vaccines reduce death losses from pseudorabies, they do not prevent spread of the virus. The widespread use of any vaccine makes detection of previous exposure to the virulent virus by serological tests impossible and thus eradication of the disease much more difficult.

Spread of Infection

Pseudorabies is spread mainly by direct contact between swine, the nose and mouth being the main entry points for the virus. Nasal discharges and saliva contain the virus, and thus drinking water, bedding, and other objects such as clothing and instruments may become contaminated with the virus. The virus can thus be spread without movement of pigs. Persons entering the swine premises should wear clean clothes and should disinfect boots on entering and leaving the premises.

Recovered pigs may become carriers of the virus and can later infect susceptible pigs or cattle with which they come in contact. Severe cattle losses from pseudorabies have occurred as a result of contact with apparently normal carrier swine. The disease also has been introduced to swine farms by introduction of apparently healthy carrier swine.

Dogs and cats are very susceptible to pseudorabies and usually become infected through contact with infected swine. Wild animals such as raccoons, skunks, and mice are also susceptible to the disease and may become infected in a manner similar to cats and dogs. Rats are quite resistant and, in Europe, have been suspected to be carriers of the virus. There is no conclusive evidence of the spread of pseudorabies by dogs, cats, or wild animals in the U.S.A., but pseudorabies-infected raccoons have been found dying on or near infected swine premises. These animals could have become infected by contact with infected swine.

Diagnosis

The clinical signs of pseudorabies are very variable, and so clinical diagnosis should always be confirmed by laboratory tests. The virus can be isolated in cell cultures inoculated with suspensions of fresh tissues, especially the tonsils, lungs, liver, spleen, and brain. Virus isolation and identification takes approximately 10 days. If good fresh specimens are submitted, more rapid confirmation of diagnosis can be obtained by using the fluorescent antibody (FA) test.

The serum-virus-neutralization (SVN or SN) test is used to detect pseudorabies antibodies in the serum of swine. These antibodies appear in the serum on about the seventh day of infection and may then persist for years. The presence of pseudorabies antibodies is certain evidence that the pig has been infected with the disease in the past. The absence of antibodies indicates that the animal has probably not been infected, or it may be in the very early stages of the disease. Diagnosis of a pseudorabies outbreak can be made by doing SN tests on paired serum samples, one taken from the pig early in the disease, and the second no sooner than 2 weeks later. A rise in antibodies from the first to the second bleeding indicates that active pseudorabies infection was present.

The SN test takes approximately 10 days to complete and is an extremely reliable test. While the test detects antibodies to the pseudorabies virus very accurately, it does not differentiate between antibodies resulting from natural disease and those resulting from vaccination. Since widespread vaccination has not been practiced in the U.S.A., the problem of differentiation exists only in a few areas. With a recently licensed live vaccine the problem of differentiation will become more serious.

Serum submitted for SN examination must be collected in clean sterile tubes (not brucellosis tubes!) and submitted packed in ice. If serum is badly hemolyzed or contaminated with bacteria, the SN test will be unreliable.

A skin test which may become a useful diagnostic tool has been developed and is undergoing field testing.

Control of Infection

The chances for introduction of the disease can be minimized by the owner through strict control of the movement of people, animals, and objects into swine premises. Clean clothes should be worn, and instruments, boots, and other objects should be decontaminated with a good disinfectant before introduction. Cats, dogs, and other animals should be kept away from pigs. Before introducing new pigs to a clean farm, they should be tested and shown to be free of pseudorabies antibodies, since pigs with antibodies are potential shedders of the virus. Such pigs should then be quarantined on the farm for 30 days, retested and, if found negative, released into the herd. Several states now require pseudorabies-antibody-free status before breeding animals may be introduced.

When pseudorabies occurs on a farm the premises should be quarantined, for a period determined by the appropriate regulatory agencies. If possible, the unaffected pigs should be separated from the sick pigs, and the movement of people and objects between them strictly controlled. Dead pigs should be disposed of by deep burial or burning. Recovered pigs should be sold only to slaughter

to prevent spread of the infection to other farms by carrier swine.

Infected premises should be thoroughly cleaned and disinfected before introduction of new pigs. During an outbreak, treatment of susceptible baby pigs with anti-pseudorabies serum before they become exposed can significantly reduce losses.

Summary

1. Pseudorabies has become a disease of major economic significance in the U.S.A.

2. Pseudorabies does not cause disease in humans, and it is not related to rabies. Pork from hogs which have recovered from pseudorabies may be used for human consumption.

3. Severe death losses, abortions, and reproductive failure may occur in pseudorabies-infected swine herds.

4. Cattle, dogs, cats, and wild animals also die of the disease.

5. Recovered swine are immune but must be considered to be carriers and, therefore, potential shedders of the virus.

6. Inactivated (killed) vaccines are generally ineffective. Modified live-virus vaccines reduce the severity of the disease, but they do not prevent infection or establishment of the carrier state in swine.

7. Pseudorabies could be eradicated, but uncontrolled use of vaccine would make this goal difficult to attain.

8. Diagnostic methods are reliable if good specimens are submitted.

9. Spread of the disease can be controlled by quarantine and strict application of hygienic measures.

10. Feeder pigs should never be brought onto premises where farrowing operations exist.

11. Drugs and feed additives are not effective for the control or treatment of pseudorabies.

