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Streptococcus suis Disease in Pigs- Pork Industry Handbook
Michigan State University Cooperative Extension Service
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pork industry handbook

Michigan State University Extension

Streptococcus Suis Disease in Pigs

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Streptococcus suis infection is a significant disease in intensive, indoor swine operations. *Strep suis* is now the most common cause of meningitis in pigs submitted to veterinary diagnostic laboratories. Furthermore, there has been a marked increase in *Strep suis* cases in nursery pigs from herds that have experienced an outbreak of the Porcine Reproductive and Respiratory Syndrome (PRRS).

Strep suis is a bacterium living in the tonsils of some pigs and capable of causing disease in the brain (meningitis) and other organs (septicemia). While *Strep suis* is most often associated with meningitis, other manifestations caused by *Strep suis* include pneumonia, a "fading piglet syndrome," polyserositis, arthritis, valvular endocarditis, myocarditis, pericarditis and abortion.

There are several types of *Strep suis*. In North America, Type 2, followed by Types 1/2, 3, and 8 are most prevalent, but types may vary depending on location. In fact, Type 7 is more frequently isolated than Type 2 from pigs at the Veterinary Diagnostic Laboratory at Iowa State University.

Clinical Signs

Although pigs from birth to adult may be affected, *Strep suis* disease outbreaks occur most frequently in recently weaned pigs. Typically, meningitis is seen in the post-weaning period. It may involve from 1% to 5% of the herd. Meningitis may appear as sudden deaths, or it may appear as convulsions and subsequent death in pigs in the first three weeks post-weaning. Often, previously robust pigs are found dead without having shown clinical signs of impending disease. Usually, however, pigs with *Strep suis* meningitis go through a progression of: loss of appetite, reddening of skin, fever, depression, loss of balance, lameness, paralysis, paddling, shaking and convulsing. Blindness and deafness may occur. Septicemia and arthritis in the absence of meningitis are less striking and go

unrecognized. The outbreak may be brought on by stress such as mixing, moving, weighing, vaccinating and weather changes which affect the ventilation and heating of buildings.

Strep suis septicemia in newborn pigs produces a "fading piglet syndrome." These pigs are born in good health, and initially, they suck avidly, but sometime over the first day or two of life they stop nursing, become lethargic, cold to the touch and die usually 12 to 24 hours after birth. The "fading pig" syndrome can be confused with starvation, but pure cultures of *Strep suis* often are cultured from the heart, blood and joints of these pigs.

In breeding herds, *Strep suis* infections are less common; however, some herds experienced a drop in farrowing rate from 85% to approximately 70% over a three month period. *Strep suis* 2 could be cultured from stillborn fetuses as well as from uteri of infected sows.

Pneumonias due to *Strep suis* are most common in 2 to 4 week old pigs, but pneumonias occur in the growing-finishing period as well. The *Strep* organism quite often is associated with other organisms such as *Pasteurella multocida*, *Actinobacillus (Haemophilus) pleuropneumoniae*, or Pseudorabies virus. In the finishing period, *Strep suis* is commonly observed after treating pneumonias with tetracyclines.

PRRS virus infection predisposes pigs to secondary bacterial diseases. *Strep suis* infection is predominant among these secondary bacterial diseases after PRRS outbreaks.

Epidemiology

Strep suis is introduced into new herds by healthy, carrier pigs which harbor the organism in their tonsils or nasal passages. Healthy pigs can develop meningitis after months of carrying the organism in their tonsils with no ill effects. The introduction of healthy carrier pigs (breeding gilts and boars, or

weaners) into noninfected herds usually results in the subsequent appearance of disease in weaners and/or growing pigs in recipient herds. Carrier gilts spread *Strep suis* organisms to their piglets when introduced into an uninfected herd. Piglets carry the organisms into the nursery, infecting other pigs. *Strep suis* affects pigs of all ages, but most cases occur between 3 and 12 weeks of age and especially after weaned pigs are mixed. Usually less than 5% of weaners are affected.

English researchers have found that breeding stock can carry *Strep suis* in their tonsils for at least 512 days. There is no test to detect the infective or carrier state in breeding stock. Medication does not eliminate the carrier state.

The common method of spreading *Strep suis* between herds is through the introduction of carrier pigs; flies, and dead carcasses also transport the bacterium. *Strep suis* lives in flies for at least five days. Flies regurgitating as they feed, may spread *Strep suis* throughout a hog unit or between units. Flies travel up to two miles on their own, and may hitch a ride on or in vehicles and travel much farther. Carcasses of dead pigs can be a source of the organism. Properly dispose of infected carcasses by burning, burial or removal from the premises.

Diagnosis

Make a definitive diagnosis after the *Strep suis* bacterium is isolated and typed from diseased organs. Clinical signs and postmortem findings are helpful, but not specific. One of the best ways to obtain a definitive diagnosis is to culture the brain tissue from affected or dead pigs. An antibacterial susceptibility test performed on organisms isolated from an affected, untreated pig identifies the most effective treatment.

Treatment and Control

Prior to learning the antibacterial susceptibility of the strep organism, affected piglets may be treated individually with injections of penicillin or ampicillin, and given supportive nursing care. Early treatment prevents death and may result in complete recovery. Generally streptococcal organisms are somewhat resistant to the tetracyclines. If the pig is down or convulsing, tranquilizers and fluids may be used. The affected pig should be removed from the pen. Water and/or electrolytes may be given orally or rectally. Give fluids at the rate of 12 ml/kg body weight (5 ml/lb). The affected pig should be kept comfortable, warm and propped up on its sternum. Typically, tetracyclines are effective on only about 6% of isolates.

Treatments aimed at the rest of the group must be considered. Injection of the whole group with penicillin, ampicillin or another antibiotic to which the strep is susceptible may be of value. This is especially true if others are affected, or history shows the chances for that are good.

Alteration of management to minimize stress from overcrowding, poor ventilation and drafts, mixing and moving pigs is a key factor in some control. Strategic antibiotic feed medication, prior to known periods of heightened risk is beneficial but often results in shifting the expression of clinical cases to later in the production cycle. If the economic effects of the disease warrant it, depopulation and restocking with clean stock may be the only effective means of eradication.

Practical preventive programs include the use of bacterins in herds with both the meningitis and reproductive problems. Some failures have been observed with commercial bacterins, and may be due to other types of streptococcus. Autogenous bacterins frequently fail to reduce disease, in part because most

bacterins contain killed bacteria. Solid immunity is developed by live or avirulent organisms. Less immunity is demonstrated by killed organisms.

To avoid introduction of *Strep suis* in uninfected herds, ask the source of new stock whether it is a problem in the herd. Have your veterinarian talk with the veterinarian in charge of that herd. Artificial insemination, embryo transfer or C-sections with cross-fostering can be used to bring genetics from infected to noninfected herds.

Monitoring herds

Monitoring herds for the presence or absence of *Strep suis* presents a difficult problem. Serological tests frequently cross react so they are of little value.

Collecting tonsillar cultures and checking for the presence of disease-producing strains of streptococcus may help identify problems. However, the techniques are difficult to accomplish and generally more suited to research purposes than for practical use as a monitoring method. *Strep suis* is difficult to find in young pigs in the first week of life in immune herds.

There is an extreme amount of variation in the virulence of streptococcus between herds. Some may be present but cause no problem, others may cause severe problems.

Eradication or elimination from a herd may be done by Specific Pathogen Free (SPF) techniques and Medicated Early Weaning (MEW). This method requires medication of the sow and removal of piglets from the sow during the first week after birth. The piglets are then reared in clean quarters apart from animals in the rest of the herd, and they are provided with feed containing appropriate medication.

Mass medication, which does not include offspring segregation at an early age, does not necessarily eliminate the organism from a herd.

Zoonotic *Strep suis* (Infection in Humans)

So far, 30 different types of *Strep suis* have been identified. As mentioned above, some types of *Strep suis* also affect humans, producing septicemia and meningitis. Meat industry workers are at greatest risk, but farmers, veterinarians, food preparers and anyone else who handles uncooked pork or is in contact with live pigs may also be exposed. Butchers and others become infected through cuts and abrasions while handling and cutting pig carcasses. Human cases have been reported from Denmark, Holland, France, United Kingdom, Canada, and Hong Kong. The disease may manifest itself as a "flu-like" disease followed by meningitis. Sixty percent of the human cases that recover have permanent hearing loss.

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