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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

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Streptococcus suis Disease in Pigs

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Streptococcus suis infection is an emerging disease in swine operations. Diagnostic laboratories recently have reported *Strep suis* as the fifth most common disease and the leading cause of meningitis, an inflammation of the brain tissue. In a recent survey of 200 swine practitioners, *Strep suis* was listed second as a disease that will cause increasing problems in the next 5 years.

Strep suis is a bacterium that lives in the tonsils of some pigs and is capable of causing disease in the brain (meningitis) and other organs (septicemia). While *Strep suis* is most often associated with meningitis, other manifestations in pigs 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*. Although in the past, type 2 has been most commonly identified with meningitis outbreaks, types other than 2 may also cause meningitis. 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 1 to 5% of the herd. Meningitis may appear as sudden deaths or pigs with convulsions dying in the first three weeks post-weaning. Previously robust pigs may be found dead without having shown clinical signs. 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 also occur. Septicemia and arthritis in the absence of meningitis are less striking and may go unrecognized. The outbreak may be brought on by stress

such as mixing, moving, weighing, vaccinating, and weather changes that affect ventilation and heating in 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 some time over the first day or two of life they stop nursing, become lethargic, and cold to the touch and die usually 12 to 24 hours after birth. The "fading pig" syndrome can be confused with starve-outs, but pure cultures of *Strep suis* are often cultured from the heart, blood, and joints of these pigs.

In breeding herds, *Strep suis* infections are less common; however, there have been cases in which the herd experienced a drop in farrowing rate from 85% to about 70% over a 3-month period. *Strep suis* 2 could be cultured from stillborn fetuses as well as from uteri of infected sows. In one herd, abortions at 60 to 80 days gestation were observed. The sows were obviously sick, running temperatures of 106 to 107° F.

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

Epidemiology

Strep suis is one more in a series of newly recognized diseases afflicting pigs in our modern pig production systems. *Strep suis* disease is prevalent in the intensive, high-population-density systems. Poor ventilation, buildup of pit gases, overcrowding, and other stress factors such as mixing, moving, weighing, and vaccinating are all associated with *Strep suis* outbreaks.

Strep suis is introduced into new herds by healthy car-

rier pigs that harbor the organism in their tonsils or nares. Healthy pigs can develop meningitis after months of carrying the organism in their tonsils with no ill effects. The introduction of these healthy carrier pigs (breeding gilts, boars, or weaners) into noninfected herds usually results in disease in weaners and/or growing pigs in recipient herds. When carrier gilts are introduced into an uninfected herd, they spread *Strep suis* organisms to their piglets. The piglets can carry the organisms into the nursery, infecting other pigs. *Strep suis* can affect pigs of all ages, but most cases occur between 3 and 12 weeks of age and especially after weaned pigs are mixed together. Less than 5% of weaners are usually affected.

English workers 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.

While the most common method of spreading *Strep suis* between herds is through introduction of carrier pigs, flies and dead carcasses may also transport the bacteria. *Strep suis* will live in flies for at least 5 days. Flies regurgitating as they feed may spread *Strep suis* throughout a hog unit or between units. Flies will travel up to 2 miles on their own, and may hitch a ride on or in vehicles much farther. Carcasses of dead pigs are also a good source of the infection. Proper disposal of infected carcasses by burning, burial, or removal from the premises is advised.

Since at least one strain of *Strep suis* (*Strep suis* type 2) also causes meningitis in humans, it is comforting to note that the *Strep suis* bacterium is easily killed by commonly used soaps and disinfectants.

Diagnosis

Definitive diagnosis is made when 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 will identify the most effective treatment for use in the herd.

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 also be used. The affected pig should be removed from the pen. Water and/or electrolytes may be given orally or per rectum. Fluids are given 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 also 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 practices to minimize stress

from overcrowding, poor ventilation, mixing, and moving pigs is a key factor in effecting 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 a later period 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 caused by other types of streptococcus. Even autogenous bacterins frequently fail to reduce disease. This may be because most bacterins contain killed bacteria. Solid immunity is developed by live or avirulent organisms. Less immunity is demonstrated by killed organisms.

In uninfected herds, to avoid introduction of *Strep suis* 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 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 (infectivity) 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 SPF techniques and medicated early weaning. This method requires medication of the sow, with the piglets removed 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 are provided with feed containing appropriate medication.

Mass medication that doesn't include offspring segregation at an early age does not necessarily eliminate the organism from a herd.

Zoonotic *Strep suis* (Infection in Humans)

So far, 17 different strains of *Strep suis* have been identified. As mentioned above, one of the strains of *Strep suis* type 2, also affects humans, producing septicemia and meningitis. Those at greatest risk are meat handlers, but housewives, farmers, and veterinarians 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 recovered cases have permanent hearing loss.



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