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Enteric Diseases of Swine

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SWINE DYSENTERY

UNIVERSITY OF IDAHO

Swine dysentery is a common and important enteric disease that causes losses of \$30 to \$50 million to the swine industry in the United States each year. Losses are caused by unthriftiness, poor feed conversion, cost of treatment and death of affected animals. The disease was first described in 1921 and has since been recognized in most major swine producing areas of the world. The disease is also called black scours, bloody scours and vibronic dysentery.

Cause

For many years *Campylobacter (Vibrio) coli* was thought to be the primary causative organism for swine dysentery. However, recent work has shown that a different bacterium, *Treponema hyodysenteria*, is the most probable primary causative organism and that *E. coli* contributes further to the development of the disease. Stress factors such as changes in feed, shipping, castration, overcrowding and chilling can predispose pigs to the disease.

Since swine are the only known carriers of *T. hyodysenteria* organisms, outbreaks in a herd can often be traced to recent introduction of carrier animals. The organisms can be transmitted by contaminated clothing or footwear and perhaps by other means. Some researchers feel that *T. hyodysenteria* is normally present in the intestinal tract of pigs and that only certain strains produce the disease. Large numbers of the organisms can usually be found in feces of infected pigs, but only during the acute phase of the disease.

Studies suggest that *T. hyodysenteria* in feces of acutely infected and carrier animals remain infective and can survive for long periods of time even under extreme environmental conditions. The organisms also may survive in manure pits and lagoons. Drying and direct contact with sunlight readily kill the organisms, however. Research is continuing to gain a better understanding of the exact cause and the mechanisms whereby the organism can cause infection.

Clinical Signs and Pathologic Changes

Swine dysentery most often affects 8 to 14 week old pigs although suckling and adult pigs also can be affected. The disease may occur at any season of the year but it appears most commonly in the late summer and early fall. Transmission occurs primarily by ingestion of contaminated feces from other infected pigs and from carrier animals that shed the organisms and yet show no clinical signs. In severe outbreaks, 90% of the pigs may be infected and the mortality rate may be 50% in untreated cases. The incubation period is usually 10 to 14 days but may vary from 2 days to 3 months. The disease may appear in 3 to 4 week cycles after withdrawal of treatment or, in some cases, may reappear even with continuous treatment.

As the disease spreads slowly through a herd, bloody diarrhea is the most common clinical sign. In early stages, the feces are pasty and yellow to gray. Later, the feces are coated with excess mucus and contain bright red to black blood. Other clinical signs develop progressively and include partial loss of appetite, elevated temperature, arched back and evidence of abdominal pain, weakness in the hind quarters, dehydration and emaciation. Pigs may die within a few hours after onset of clinical signs, but usually the clinical course persists for several days. The cause of death is believed to be dehydration, acidosis and other physiologic alterations.

Pathologic changes are confined to variable-sized regions in the cecum and especially the spiral colon of the large intestine and seem to be directly associated with the growth of the *T. hyodysenteria* organisms in these locations. Similar lesions have not been observed in other portions of the intestinal tract. The lining of the affected portions of the large intestine in intermediate and longstanding cases appears necrotic, thickened and coated with fibrin, blood and mucus. Microscopically, the causative organisms are seen to invade and cause widespread death of the lining epithelial cells.

Diagnosis

Herd history, clinical signs and visible pathologic changes are all helpful in making a presumptive diagnosis of swine dysentery. A final diagnosis can only be made in the laboratory by special methods such as dark-field or fluorescence microscopy. In all cases, final diagnosis should be made with the assistance of your veterinarian and supported by a diagnostic laboratory when required. Other diseases that may result in a bloody diarrhea and must be considered in a differential diagnosis include whipworm infestation, salmonellosis and coccidiosis. Colibacillosis and transmissible gastroenteritis can also cause diarrhea in weaned and growing pigs but bloody feces is usually not an important clinical feature.

Treatment and Prevention

The most effective treatment for acutely affected pigs is to add medication to the drinking water. Medications are also routinely mixed in the feed to prevent the disease. Successful medications include certain organic arsenical compounds and tylosin, neomycin, bacitracin, furazolidone or other newer, more effective drugs. Sodium arsanilate is still commonly used today because of low cost, although an overdosage will cause toxicity problems. A number of more recently developed drugs are highly effective against *T. hyodysenteria* but are not commercially available because they have not been approved for use in swine by the Federal Food and Drug Administration.

To help control the spread of infection, you also should:

1. Separate and isolate clinically affected pigs from apparently normal ones;
2. Maintain pigs on a concrete floor that can be washed daily and alternately;

3. Disperse the pigs to a large grazing area to reduce the chances of exposure and reexposure.

The disease may reappear in the same group of pigs despite treatment, continuous medication and corrective management. Some pigs remain permanently infected carriers; many recover and are immune and resistant to subsequent reexposure. None of the commonly used treatments will completely eradicate the disease from a premises or eliminate the carrier state in all animals.

Recent evidence has shown that certain strains of *T. hyodysenteria* have developed resistance to sodium arsanilate and tylosin. Several other drugs are less effective than before, perhaps for the same reason.

Swine producers should always take precautions to keep from introducing the disease into a noninfected herd. Isolation of the herd and rigid sanitation management are vitally important.

Be certain that new replacement stock originates from herds free of swine dysentery. Primary SPF pigs are also acceptable replacement stock. Further, all new replacement stock should be quarantined, particularly since carrier animals often become clinically ill with swine dysentery soon after being transported.

Minimize stress by avoiding exposure to severe weather, over-crowding and handling and drastic and sudden dietary changes. In cases of chronic swine dysentery, herd owners may have to get rid of all swine for a period of time. This should be done during warm, dry weather to increase the chances of eliminating the infectious organisms from the premises. After animals are removed, all buildings should be thoroughly cleaned and disinfected and dirt lots should be plowed under. You can bring in new, noninfected replacement stock in not less than 60 days after the infected animals are removed from the herds. Serious losses may also be avoided in exposed herds by the use of preventive levels of medication.