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G85-748 Prevention and Control of Swine Dysentery

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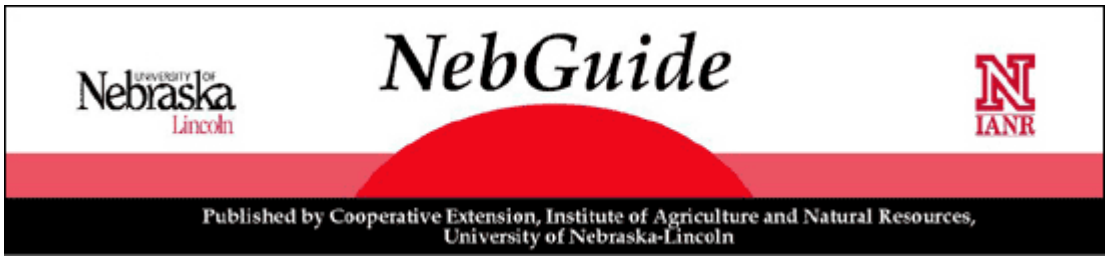

Prevention and Control of Swine Dysentery

This NebGuide describes the causes and symptoms of swine dysentery and offers management recommendations and treatment procedures for its prevention and control.

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- Clinical Signs
- Introduction and Maintenance of Swine Dysentery on the Farm
- Diagnosis of Swine Dysentery
- Control of Swine Dysentery
- Treatment Recommendations
    - Management Recommendations
- Management Recommendations for Eradication Without Depopulation
- Management Recommendations for Eradication With Depopulation

Swine dysentery is a highly contagious disease of growing and finishing pigs. First described in Indiana in 1921, it has been called black scours, bloody scours, and vibrionic dysentery.

Swine dysentery causes important financial losses because of reduced feed efficiency and lower weight gain, costs of medication and additional animal care, and death. Substantial costs may result from loss of sales of breeding stock, or depopulation when necessary. *Serpula (Treponema) hyodysenteriae*, a spiral bacterium, is the cause of swine dysentery, and seven different types have been recognized worldwide. Types 1 and 2 are the most common in the United States.

Clinical Signs

Pigs of all ages are susceptible to swine dysentery, but the disease is most frequently seen in feeder pigs 8 to 14 weeks old. The incubation period for swine dysentery is highly variable and can range between 10 to 30 days. The acute form of the disease is characterized by severe and often fatal bloody diarrhea. Affected pigs may be wobbly in the hindquarters and show evidence of abdominal pain, such as stretching and kicking at the belly. The feces may be red, resembling tomato ketchup, or may have a black, tarry appearance. Death usually results from dehydration caused by severe diarrhea. In herds

where the disease has become well-established, the only signs affected pigs may exhibit are lower weight gain and reduced feed efficiency.

Introduction and Maintenance of Swine Dysentery on the Farm

An important aspect of the disease is that pigs can continue to transmit swine dysentery even after they recover from diarrhea because they continue to "shed" the *S. hyodysenteriae* in their feces. These carrier-shedder pigs are the major source of the disease on infected farms, and also transmit it to noninfected farms. Once introduced onto a farm, *S. hyodysenteriae* quickly becomes established in the swine herd, the environment (especially waste collection systems), and the resident rodent populations. Shedding of *S. hyodysenteriae* in the feces of birds, dogs and mice makes these species potential vectors of swine dysentery among herds.

Several factors determine the extent and severity of swine dysentery in a swine herd. These factors are similar for many disease agents affecting swine raised under intensive production practices and broadly include:

1. the dose and virulence of the agent;
2. the degree of stressors imposed on the animals;
3. the level of immunity in the population at risk;
4. and the effectiveness of the control measures used once an outbreak occurs.

The dose of *S. hyodysenteriae* to which pigs are exposed depends on the degree of environmental contamination, which in turn is directly related to swine population density, level of hygiene, segregation of sick and poor-doing animals, and effectiveness of the medication strategy. Very little is known about the relative virulence of individual strains of *S. hyodysenteriae*. Environmental stressors decrease the resistance of pigs to diseases, causing recurrence of diarrhea in carrier pigs, and poor response to treatment in sick animals.

Diagnosis of Swine Dysentery

A key element to rational treatment and effective control of swine dysentery is correct diagnosis at the onset of an outbreak of the disease. Diagnosis of swine dysentery in chronically affected herds can be difficult and may require several submissions to a diagnostic laboratory before final confirmation is possible.

A presumptive diagnosis of swine dysentery is based on herd history, clinical signs, and observation of characteristic lesions in the large intestine of affected pigs. Other conditions which can be confused with swine dysentery or may sometimes occur in conjunction with swine dysentery include: porcine proliferative enteritis, salmonellosis, whipworm infestation, clostridial enteritis, coccidiosis, intoxications, and post-weaning colibacillosis.

These conditions can be tentatively differentiated on the basis of clinical signs and the appearance of the intestines at necropsy. Thread-like worms are seen on the lining of the large intestine of pigs affected with whipworms, whereas damage to the intestinal lining is present in both the small and the large intestine with porcine proliferative enteritis, salmonellosis, clostridial enteritis, coccidiosis, and intoxications.

Clostridial enteritis generally affects pigs during the first week of life and causes blood to accumulate mostly in the small intestine. While *S. hyodysenteriae* does infect young nursing pigs, blood is absent

and mucoid diarrhea is all that is seen in that age pigs. TGE virus, rotavirus, and colibacillosis can affect weaned pigs and cause diarrhea, but there is usually no blood in the feces and the diarrhea is usually watery with these diseases. Bleeding gastric ulcers cause large blood clots inside the stomach and intestine, accompanied by erosions and/or ulcerations of the stomach lining.

Specimens of large intestine collected as soon as possible after death, preferably from an animal that has not been treated with antibiotics, should be sent chilled on ice, and also fixed in buffered 10 percent formalin, to a laboratory familiar with the isolation and identification of *S. hyodysenteriae*. Laboratory tests used to confirm swine dysentery include histopathology, examination of wet mounts of feces or scrapings from the colon, to detect the presence of large numbers of spiral bacteria, and isolation of *S. hyodysenteriae* from the feces or intestine using selective culture methods. Typing of *S. hyodysenteriae* isolated from a herd may be useful where swine dysentery is a recurrent problem, or when the disease recurs in a depopulated or vaccinated herd.

Control of Swine Dysentery

Control of swine dysentery currently involves medicating water and/or feed with antimicrobials, stringent sanitation of the premises, and depopulation where feasible. Vaccination for prevention of swine dysentery may represent a viable alternative; however, the effectiveness of commercially available vaccines appears to be less than optimal. Although medicating pigs is an essential step for control of the disease, eradication of swine dysentery from the farm requires eliminating *S. hyodysenteriae* from the environment, including equipment, waste collection systems, and resident rodent population.

Because control of swine dysentery is costly, it is imperative that the producer and the attending veterinarian compare the costs and feasibility of controlling versus eradicating the disease without depopulation, with partial depopulation, or with complete depopulation. Before reaching a final decision on the course of action, the following points should be considered:

1. value of the herd, considering current market conditions;
2. feasibility of reducing the herd size by selling market hogs and culling excess breeding stock;
3. potential for success of the eradication efforts;
4. potential to stay free of swine dysentery after depopulation and cleaning;
5. opportunity to eradicate other diseases affecting the herd at the same time.

Success depends upon the constraints of the herd restocking procedures, design of the buildings, the system of waste management, and the owner's production goals and disease management skills.

Treatment Recommendations

An effective treatment regimen without depopulation generally includes water medication followed by feed medication and isolation of pigs with diarrhea in sick pens for special care and/or additional injections. Under certain market conditions, however, the costs of drugs may reduce or completely eliminate the profit margin for market pigs, thus making depopulation a viable alternative.

Carbadox (Mecadox), Tiamulin, and Lincomycin are some of the compounds most commonly used for treatment. Gentamicin sulfate has been used in some herds with variable success. Sodium arsanilate is no longer effective and may cause medicated pigs to "break" with bloody diarrhea.

Dysentery will persist or even recur in animals that do not consume sufficient amounts of medicated

feed or water either because of error in calculation of dosage, defective automatic feeders, water nipples, or water lines, or because pigs have reduced feed or water intake due to poor appetite resulting from swine dysentery or other concurrent illnesses.

Antimicrobial compounds should be used in accordance with the manufacturers' recommended dosage for treatment or prevention. Withdrawal times for all medications should be carefully adhered to before marketing animals for slaughter. Note that withdrawal times may vary for certain drugs used at various dosage levels.

Management Recommendations

Management practices that help control swine dysentery include:

1. Optimizing sanitation by maintaining pigs on concrete floors that are washed down daily.
2. Limiting population density.
3. Adhering to a rodent control program using a professional exterminator.
4. Segregating affected pigs in a sick pen, away from healthy pigs, and culling poor-doers.

Stringent sanitation practices are the most effective and economical means of controlling swine dysentery. Factors that affect hygiene and sanitation efforts are the design of a swine unit, waste management procedures, method of cleaning, type of disinfectant used, effectiveness of management and medication strategies for sick and poor-doing pigs. The facilities should be cleaned with steam or high pressure water systems.

Choice and appropriate use of disinfectants are critical to the sanitation effort. Chlorhexidine, formaldehyde and other aldehydes, cresols and phenols are most effective for disinfecting the premises and for use in foot baths. Use of boots, foot baths, brushes and disinfectants adds costs and labor to a swine operation, but translates into money and effort well spent when it comes to preventing disease transmission. Sodium hydroxide (lye) can be used for disinfecting the premises, but its use is limited because of its caustic properties.

Chlorine, hypochlorites, chloramines, and iodophores are useful for cleaning equipment, but become ineffective when exposed to animal or food wastes. They are effective only if applied to completely clean surfaces. Quaternary ammonium compounds are not inactivated by organic debris, but are incompatible with soaps.

Fumigation of the premises is ideal as long as it can be done safely and under appropriate conditions.

Management Recommendations for Eradication Without Depopulation

Swine farms without dirt lots that have concrete pens that can be cleaned easily and disinfected have the potential to eradicate swine dysentery without depopulation. Farms with flush systems where pigs have access to the flush water, especially when lagoon water is recycled as flush water, are unlikely candidates for successful eradication without depopulation.

A program for eradicating swine dysentery without depopulation requires the following actions:

1. Decrease pig density by partially depopulating the herd.
2. Empty and clean manure pits and keep them at low levels to prevent overflow.
3. Medicate the entire herd, including boars and sows, for 21 to 30 days with a compound that has

been shown to eliminate *S. hyodysenteriae* from infected pigs. Pigs nursing while the herd is medicated should be medicated at the time of weaning.

4. Wash medicated pigs with 0.5 percent sodium hypochlorite solution, paying special attention to the animal's feet. Move disinfected pigs to clean pens that have been disinfected with a disinfectant recommended for premises (see text above).
5. Continue to medicate clean pigs for three additional weeks or longer.
6. Prevent re-exposure to carrier pigs or to a contaminated environment.

Management Recommendations for Eradication With Depopulation

Depopulation may be considered in some herds; however, this approach depends on market conditions and the producer's production goals.

After removing infected pigs and cleaning/disinfecting the premises, rodents and waste collection systems may remain as a source of *S. hyodysenteriae*. To reduce the chances of recontamination, exterminate rodents and improve waste management systems.

Pits should be emptied, cleaned, and kept at low level to prevent overflow. Cover open flush gutters with slats or metal grates. Fresh water instead of recycled lagoon water should be used in facilities where flush gutter systems are used.

Control and eradication programs have greater chances of success if they are carried out during the summer months, because dryness and heat make it hard for *S. hyodysenteriae* to survive in the environment. Since *S. hyodysenteriae* does not survive in a dry, organic debris-free environment, facilities should remain empty at least 30 days before repopulation. This will allow time for the environment to dry thoroughly after cleaning and disinfection.

Pigs for restocking should come from a farm known to be closed; in addition, pigs should be free of active diseases, nonmedicated for swine dysentery, and under veterinary supervision for a minimum of at least one year before purchase. Because the incubation period for swine dysentery is extremely variable, newly acquired stock should be placed in isolation for 30 days or longer.

No matter what approach is used, always work closely with a veterinarian since a swine dysentery eradication program is prone to failure if every possible source of reinfection has not been considered and addressed.

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