

Randall J. Berrier, DVM
Staff Veterinarian
Technical Service

Clostridium Perfringens in Domestic Farm Animals

INTRODUCTION

Clostridium perfringens is a spore forming, anaerobic bacteria widely distributed in the soil and the digestive tract of many domestic animals. Six Types (A, B, C, D, E and F) have been identified on the basis of the toxins produced, with Types B, C and D being the most commonly associated with disease in domestic animals. Vaccines and antitoxins that produce protection to Types C (Alpha and Beta toxins) and D (Alpha and Epsilon toxins) will also protect against Type B (Alpha, Beta and Epsilon toxins).

Type B is a highly fatal intoxication of young lambs and is commonly referred to as lamb dysentery. Type B has also been associated with disease in young calves. Type C is associated with hemorrhagic and necrotic enteritis in cattle, sheep, goats and swine. Type D is associated primarily with sheep, less frequently with cattle and goats, and is commonly referred to as "Pulpy kidney disease" or "Overeating disease".

Clostridium perfringens normally inhabits the digestive tract in small numbers without causing disease. If any toxin is produced, it is in small quantities and passes through the animal without causing problems. If an animal is exposed to a sudden increase in carbohydrates, such as a heavy feeding of milk, lush pastures or supplementary concentrates, resident bacteria may multiply rapidly and produce large amounts of toxin. These toxins may damage the intestines, facilitating the absorption of toxins to the bloodstream. The end result of this intoxication is usually rapid death. The collective term for this disease is enterotoxemia.

Clinical signs are usually absent with animals that were healthy several hours prior and then suddenly found dead. Close observation of animals prior to death may reveal animals that are listless, have stopped nursing or demonstrating signs of colic. Central nervous system signs such as excitement, incoordination, circling, headpressing and convulsions may be noted prior to coma and death. Body temperature is usually normal or subnormal unless associated with convulsions, in which case the body temperature may be one to two degrees above normal. Diarrhea may be noted, depending on the amount of toxin produced and the length of illness. Frequently, animals near death or that have died recently, are found on their side with the head and neck bent backwards.

Post mortem examination may reveal internal lesions. Lesions which may be noted include: inflammation of the intestinal wall, diarrhea with or without blood in the intestine, small areas of hemorrhage on the surface of the intestines and heart, fluid around the heart or rapid degeneration of the kidneys (hence the name "Pulpy kidney disease"). Diagnosis is based on clinical signs, if noted, post mortem lesions and demonstration of specific toxin in intestinal contents.

CONTROL AND PREVENTION

Due to the acuteness of intoxication and death, treatment is usually not an option and prevention of enterotoxemia involves both management and vaccination of susceptible animals. Management practices such as gradual feed changes and feeding hay early in the day prior to turning out on lush pastures will decrease the chances of carbohydrate overload.

Immunization with a product containing *Clostridium perfringens* Types C and D should be an integral part of a vaccination program. Naive animals should be vaccinated twice, with the second dosage administered three to four weeks after the first. Animals entering a feedlot or experiencing diet changes should receive the second vaccination at least two weeks prior to these anticipated events. Once an animal has been properly vaccinated, an annual booster vaccination is recommended.

Enterotoxemia may occur in newborn and young animals, in which vaccination prior to exposure is impossible. Prevention of enterotoxemia in newborns should involve a vaccination program of the dam. Dams that have not been vaccinated previously should receive a product containing *C. perfringens* Types C and D toxoid 60 and 30 days prior to giving birth. Previously vaccinated dams should be boosted about 30 days prior to giving birth.



Also, transfer of colostrum from the dam to the newborn should be verified.

In addition to vaccination, antitoxin that contains antibodies to *Cl. perfringens* Types C and D can also be used in a prevention program. Animals which are at risk, and adequate time is not available for a vaccination program to be instituted (i.e. newborns), can benefit short term from the administration of C and D antitoxin. C and D antitoxin will provide an animal with 10 days to 3 weeks of protection and can also be used in a treatment program, if disease is diagnosed early.

There are other diseases that may cause sudden death, and for specific management recommendations to control this complex disease, it is recommended that producers consult with a veterinarian before instituting a prevention or control program.

Colorado Serum Company proudly produces and distributes products containing *Clostridium perfringens* Types C&D Toxoids and C&D Antitoxin. Contact your local distributor or veterinarian and request these and other fine products from Colorado Serum Company.