



FACT SHEET

Department of Animal Science, University of Connecticut

Effective Horse Management - Horse Health Series

Equine Botulism - Causes, Signs, & Prevention

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In 2008, there were many reported cases of botulism or suspected botulism in the United States, including horses suspected to be affected in Connecticut. A large outbreak in Florida killed 114 horses, and there were four horses affected in Vermont, two dead and two that showed symptoms at that time. This illness can be a serious problem, so we will discuss the causes, signs, and prevention of botulism.

Causes of Botulism

Botulism is a disease that occurs when toxins produced by *Clostridium botulinum*, an anaerobic spore-forming gram-positive bacterium, blocks the release of acetylcholine, a neurotransmitter. Acetylcholine acts to allow muscles to contract; without it the horse's muscles cannot contract, including the diaphragm. The diaphragm is associated with breathing when contracted thus affected horse may die of respiratory failure and asphyxia. There are seven recognized types of botulism (A, B, Ca, Cb, D, E, F and G), and of these types, Type A, B, C and D cause most cases in animals. Type A has been found in several cases in horses in the northwestern states including Washington and Oregon. Type B is predominantly seen in horses as it has been found to affect up to 80% of horses diagnosed with botulism. Type C is associated with ingestion of feed containing a decomposed carcass (bird, cat, dog, rodent, etc.) or from eating the bones of

dead animals. Type C is also found, like Type D, in poultry and poultry manures, mink, and wild ducks.

A horse can get botulism by:

- U consuming soil containing the bacteria, which then produces toxins in the digestive tract that are then transferred into the bloodstream (most common in foals - aka shaker foal syndrome)
- U consuming forage or feed containing the toxins already formed by the bacteria (aka forage poisoning)
- U through puncture wounds which close after the bacteria invades, resulting in conditions favorable for the bacteria to produce the toxins - rare

Signs of Botulism

Horses that are affected usually show the signs below, but onset is so rapid that the horse may be found dead. These signs, which can occur within several hours or up to 7-10 days post ingestion of contaminated feed, include:

- U muscle tremors
- U weakened, recumbent (unable to stand)
- U tongue hangs from the mouth (since the horse cannot control it)
- U unable to eat
- U drool because they can't swallow
- U walk stiffly with a short stride or may be weak and stumble
- U lose tail tone
- U dilated pupils
- U decreased muscle tone of the eyelid
- U green or milky nasal discharge
- U respiratory failure
- U asphyxia

It usually only takes one to two days to cause death. Recommended treatment includes giving the horse an antitoxin which may cost more than \$3,000/horse. It is most beneficial if used when a horse is first observed to be sick. Horses can recover with supportive care but will most likely die despite treatment if exposed to a large amount of toxin.

Prevention of Botulism

- U There is a USDA approved vaccine available to prevent botulism. Neogen makes the vaccine, sold as BotVax B. It only effective against Type B. Speak to your veterinarian about the best vaccination schedule for your horse. There is an initial 3-dose series for those horses that have not been previously vaccinated or have an unknown vaccination history. Once horses have been vaccinated, revaccination occurs annually.

- U Check your bales of hay and feed carefully to be sure that there are no small, dead animals included, since ingesting the bacterium in feed is the most common route of infection.
- U Avoid feeding poor-quality round bales since it is a particular risk factor if baled with excessive moisture content. Do not allow any round bales to be exposed to the weather. Check round bales periodically for quality. Spoiled material is most likely to be internal in round bales and may need to be opened to check for quality. If you do feed round bales, it is best to have an amount that horses can consume in one week to avoid having them consume moldy feed.
- U Always keep rodents and other small animals away from food and water supplies.
- U Remove and deeply bury dead animals.
- U Feeding silage or haylage to horses can also create a risk for botulism if the pH was not lowered enough to inhibit the growth of *C. botulinum* and prevent the toxin from being produced. It is recommended that horses that will be fed silage be vaccinated against botulism.
- U Use of poultry manure on land intended for hay production for horses may be a risk factor.
- U Make sure hay is baled at less than 22% moisture level or use acid preservatives on hay when baling. This ensures that pH drops below 4.5 rapidly (within 2-3 days of bagging).
- U When raking hay, raise up the tines of the hay so it doesn't pull soil into the hay that could have *C. botulinum* in it (since the bacterium is commonly present in soil).

Botulism is a scary but most likely preventable disease. This is a good time to be sure that you are storing feed away from rodents and to implement new practices of checking your hay regularly to be sure that there are no decomposed carcasses in it. Also be sure that you are storing your hay out of the weather and away from excess moisture. Check into vaccination. Thanks, and have fun with your horses!

Sources:

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