

# Prevention and Outbreak Management of Foal Diarrhea

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Diarrhea is among the most common clinical complaints in foals. According to the National Animal Health Monitoring System Equine '98 study, diarrhea affected > 20% of foals within the first 6 months of age. Although diarrhea is common with enteritis (inflammation of the small intestine), diarrhea is not always associated with inflammation of the bowel. Before the veterinarian can consider a treatment course for diarrhea they must understand the mechanisms of diarrhea. Is it malabsorptive or secretory diarrhea? Malabsorptive is the inability of the intestinal tract to reabsorb water and nutrients. Secretory diarrhea results in the hypersecretion of both water and electrolytes into the intestinal tract. In a general categorization, bacterial toxins (Ex. *Salmonella* or *Clostridium spp.*) may cause a secretory diarrhea while viruses (Ex. *Rotavirus* and *Coronavirus*) can result in a malabsorptive diarrhea. In severe infections both bacteria and viruses can result in both a secretory and malabsorptive diarrhea. Most infectious causes of diarrhea and enteritis result in signs of mild to severe abdominal pain.

Diagnosing the cause of enteritis in foals can be difficult because of the myriad of potential causes. Obtaining historical information can provide clues to the etiology of the enteritis. Questions may include:

- Have there been or currently any other animals on the farm having fevers or diarrhea?
- Has the foal received any medications that may have predisposed it to diarrhea?
- Have there been any changes in management (Feeding, turnout and etc.)?
- What is the consistency of the feces? Fetid in odor?
- What is the age of the foal?

Infectious causes of diarrhea may include Rotavirus, Coronavirus, *Clostridium perfringens A* and *C*, *Clostridium difficile*, *Campylobacter*, *Enterococcus durans*, *Bacteroides fragilis* and *Rhodococcus equi*.

Non-infectious causes of diarrhea include decreased oxygenation of the bowel during foaling (This causes a transient injury to the intestine that results in fetal diarrhea), foal heat diarrhea, diet and ingestion of sand.

## DIAGNOSIS:

Diagnosis of diarrhea requires detection of the virus, bacteria and/or toxins in feces. The tests include electron microscopy, enzyme linked immunoassay (ELISA), Polymerase chain reaction (PCR- Which is a DNA test) and culture. Our clinic currently offers a variety of comprehensive (panels) diagnostics that can test for several organisms from just one fecal sample. Call your veterinarian for more information.

## TREATMENTS:

**Treatments** for the viral, bacterial and non-infectious diarrhea are generally empirical and symptomatic which **MAY** include antibiotics (If bacterial in origin: Example is Metronidazole for Clostridial diarrhea) and anti-ulcer medications (Carafate or Gastrogard®). Antidiarrheal medications such as bismuth subsalicylate (Pepto-bismol®) may help reduce bowel inflammation and provide for secondary toxin absorption. One novel treatment plan currently used as an adjunctive treatments for both viral and bacterial causes of diarrhea is the use of Bentonite clay. Bentonite is effective because it bonds to a variety of toxins and prevents the absorption of toxins by coating the intestinal wall. Not all bentonite clay is created equally and currently there is an ultra-purified bentonite clay that is available for use in our equine patients. **(Hagyard Anti-Diarrhea Gel which can be purchased at our pharmacy)**

Fluid therapy may be necessary in animals with severe diarrhea to correct hydration, shock and electrolyte imbalances. Prevention of infectious diarrhea requires proper hygiene. Vaccines are available for salmonella and *Clostridium perfringens* at our pharmacy. These vaccines were developed by Hagyard's veterinarians and Dr. John Timmone. For more information about these vaccines feel free to call our pharmacy or consult one of our veterinarians.

## Infectious Control Measures for animals with Diarrhea

### **Isolation from the remainder of the population:**

Horses that have recovered clinically from an episode of diarrhea or that continue to pass soft feces may potentially shed infectious organisms in their feces and therefore should be isolated from healthy animals. This isolation period is most easily managed in a stall for most farm situations. In general, a minimum period of 30 days isolation is recommended for horses diagnosed with *Salmonella* and a period of 14 days after normalization of feces in horses infected with *Rotavirus* and *Clostridium*. Those diagnosed with *Salmonella* should be re-cultured prior to returning to the

normal population (see section: return to normal farm population). Additionally, the recovering horse should not be placed in stressful situations or activities (hard exercise, long-distance transportation, athletic competition, and elective veterinary procedures) as this may induce the recurrence of diarrhea or the shedding of infectious organisms.

#### **Handling the affected individual:**

Horses that have recovered clinically from an episode of diarrhea or horses that continue to pass soft feces may potentially shed infectious organisms in their feces and should therefore be handled with care to avoid spreading or carrying infected feces from the area of isolation to the normal farm population. Farm personnel should wear gloves, boots, and protective gowns when handling the affected horse to avoid cross-contamination. These protective articles of clothing may then be removed and either discarded or saved at stall-side for use when re-entering the stall (**Hagyard pharmacy stocks a variety of gowns, gloves and protective footwear. Call for more information!**). Additional actions include foot-baths and hand-washing (soap & water or hand disinfectants), but these control measures are effective only if consistently and stringently used. Farm personnel should remember that infectious organisms are not visible and may be in feces that have contacted the horse's tail and then spread to other parts of the body or the walls of the stall, feed containers, water buckets (eg, a water hose submerged in a contaminated water bucket can conceivably carry infectious organisms to other water buckets) and grooming tools (ie, brushes, combs). Farm personnel should be informed that *Salmonella* may cause illness in humans. Other agents may cause illness in people who are immunocompromised.

#### **Manure disposal:**

Horses that have recovered clinically from an episode of diarrhea or that continue to pass soft feces have the potential to shed infectious organisms in their feces; therefore, feces and contaminated bedding material should not be spread on pastures where other horses or farm animals (dogs, cats, cattle...) may come in contact and potentially consume the material. Ideally, feces and contaminated bedding should be discarded at a landfill. Composting may be effective in killing infectious organisms if the compost material reaches adequate temperatures and if the material remains unused for several months.

#### **Cleaning and disinfection:**

Stall cleaning must begin with complete removal of all bedding and fecal material. In some cases, it may be necessary to scrape the fecal material from the floor or walls. Pressure washing machines may aerosolize organisms and spread them into other stalls or the rafters above the contaminated stall, therefore this type of equipment should not be used for cleaning when infectious organisms are likely. After thoroughly removing all fecal material, the walls and floor (if solid) should be scrubbed with detergent (ie, Tide or Universal Barn Cleaner used by our hospital) and water, and then rinsed. After thorough cleaning, the walls and floor should be sprayed with a suitable disinfectant for the suspected agent.

A number of disinfectants can be considered. Phenolic compounds such as Biophene (Sold at our pharmacy) Tek-Trol, or 1-Stroke will kill bacteria (eg, *Salmonella*) and viruses (eg, Rotavirus) and this class of disinfectants is effective in the presence of organic material (ie, mucus, blood, manure); however, these compounds are corrosive.

Chlorine-containing compounds are corrosive and will cause discoloration. Additionally, these agents are inactivated by organic material; therefore, thorough cleaning must take place before these agents can be used. These agents are ineffective against Rotavirus.

Iodophors are corrosive and inactivated by organic material. They should not be mixed with chlorine-containing compounds for disinfection.

Quaternary ammonium compounds (eg, Roccal-D, Virkon-S, Madisan 75) are non-corrosive. They are not as effective against Enterobacteriaceae and they can be incompatible with many soaps and detergents. They are inactivated by organic material.

#### **Return to the normal farm population:**

The time required for a horse to return to the normal farm population without being a source of infection and a source of contamination to the environment will vary depending on the infectious agent. Horses infected with *Salmonella* may shed the bacteria for unknown periods of time. The best (and most widely accepted) available method for determining how long the *Salmonella*-infected horse will shed and how long the horse should be isolated is to submit feces for microbiologic culture. About 60% of horses that have recovered from Salmonellosis have negative fecal cultures by 30 days after recovery, and about 95% are negative by 90 days (Dr. Brad Smith Personal communication). Because it is impossible to predict the degree to which an infected horse sheds *Salmonella*, the infected horse should be isolated from other horses for a minimum of 30 days. After this time period has passed, a series of 5 fecal cultures should be performed. These fecal samples may be submitted once daily or once weekly, depending on the recommendation of your veterinarian. Regardless of the technique, negative results on five consecutive cultures should be obtained prior to reintroducing this horse into the herd.

It is generally accepted that horses infected with *Rotavirus* may shed the virus for a period of 14 days after normalization of feces. A similar isolation period is recommended for horses infected with *Clostridium*.



**FIGURE 1:** Poor hygiene. No paper towel holder or antibacterial soap dispenser. Without proper hygiene it would be impossible to control diarrhea on your farm



**FIGURE 2:** Ideal Hand Hygiene set up: Note wall mounted soap dispenser, Towel dispenser and clean sink area.