



# EQUINE REPRODUCTION SVC

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## Tracking Down (and Preventing) Emerging Equine GI Diseases

Beyond being a pain in the gut, equine gastrointestinal (GI) diseases are expensive to deal with. Take a diarrhea outbreak, for instance: Diagnosing the cause, implementing biosecurity measures, eliminating the infectious agent, and returning to business-as-usual involves significant amounts of time and money.

Nathan Slovis, DVM, Dipl. ACVIM, is infectious disease specialist and equine emergency response director at Hagyard Equine Medical Institute, among other roles at the Lexington, Kentucky, and he's researched a variety of equine GI diseases and how they spread on farms and in clinics. In a sunrise session at the 2015 American Association of Equine Practitioner's convention, held Dec. 5-9, in Las Vegas, he and Ron Vin, DVM, Dipl. ACVIM, of Myhre Equine Clinic, and Christian Leutenegger, DrVetMed, PhD, FVH, of IDEXX Veterinary Laboratories, described emerging equine GI diseases, how to detect them, and how to avoid them in the first place.

### Foal Diarrhea

The presenters said that GI disease can be difficult to manage, particularly in foals. The National Animal Health Monitoring System reported in its 1998 study that 20% of foals develop infectious diarrhea by six months of age. In a more recent study<sup>1</sup>, published in 2009, researchers found an infectious agent in 55% of foals with diarrhea, but this begs the question: Does that infectious agent cause the diarrhea?

Identifying which pathogens are involved in a horse's GI illness is essential determining the cause of disease. Veterinarians can perform a rapid diagnostic test on fecal samples using a PCR (polymerase chain reaction) test—the chain reaction makes millions of copies of a pathogen's DNA to enable analysis. Slovis said that the load of virus in the sample is the best indicator of disease outcome, both in terms of degree of illness and the speed of resolution. PCR is also useful for identifying genes from bacteria that produce toxins.

In one study<sup>2</sup>, testing revealed a high percentage of rotavirus in foals with diarrhea. The researchers identified *Cryptosporidium* and coronavirus in both healthy and sick animals. Slovis, an author on the study, said, "The overall prevalence for any infectious agent was 63% in the diarrhea group and 43% in the healthy group, but just because a test identifies an infectious agent in the feces may not indicate that is the cause of disease."

Researchers found co-infections—more than one type of infectious agent per animal—more frequently in the diarrhea group (22 co-infections vs. 15 mono-infections) than in the healthy group (12 vs. four, respectively). Six of eight infectious agents detected were associated with the diarrhea group; the other two agents were not (equine coronavirus and *R. equi*). In general and especially if finances are a concern during a diarrhea outbreak, Slovis recommends pooling fecal samples—in other words, mixing together the feces of three to five horses and submitting it to the lab for one price.

In a different study, more than 20% of 59 foals born on one farm had diarrhea. Most cases developed within 48 hours of birth, many beginning at two days old despite foals living in different stalls. Testing revealed a potpourri of organisms in both healthy and sick foals but pointed to *Enterococcus* as the culprit, as researchers confirmed its presence in 71% of diarrheic foals but in none of the healthy foals. With further sleuthing, veterinarians detected *Enterococcus* somewhere completely unexpected: on the foaling cart and the book used to record foaling events. As the foaling manager assisted with the birth and recorded the event, the individual inadvertently transferred *Enterococcus* bacteria from hands to foaling stall and foal. The farm personnel had adopted other biosecurity measures, such as using booties when entering the stall, but Slovis noted that unless someone uses gloves to take off the booties, then hands are soiled; so, he stopped recommending the use of booties with certain diseases.

He advised taking environmental samples with a Swiffer dry electrostatic towel to keep tabs on pathogens in the barn or clinic. You can reduce contaminants in the environment—and everything is a potential contaminant—easily by using antiseptic wipes regularly on all surfaces that may be touched, including handles, doors, window sills, lights, etc. Slovis added that *Cryptosporidium*, often found in barns, can be quantified using a PCR test as a "marker" for environmental cleanliness. Birds carry this organism and defecate it into the horse's environment, and good hygiene practices can minimize its presence.

### Coronavirus in Adult Horses

Historically, coronavirus has been responsible for causing severe acute respiratory syndrome (SARS) in humans, but Vin said it is emerging as a significant GI disease in adult horses across the United States. Since 2011, fecal samples from 560 horses of all ages older than one year of age have been tested for coronavirus enteritis throughout various states. Clinical signs include diarrhea, colic, fever, and white blood cell suppression within two to four days of onset. Of 35 horses testing positive for coronavirus, three were co-infected with *Cryptosporidium*.

Coronavirus appears to be a seasonal disease, occurring more frequently in winter, but it can crop up anytime. Of horses testing positive for coronavirus in the 2011 outbreak, a few that died exhibited neurologic signs attributable to excess ammonia levels in the bloodstream—this appears to be a trend with cases of equine coronavirus. In general, two out of three horses affected with coronaviral enteritis develop fever, unwillingness to eat, and GI dysfunction. Infected horses shed high loads of virus in the feces and nasal mucosa for up to two weeks.

### Take-Home Message

The presenters recommended combining the use of PCR panels with quantitative toxin gene analysis rather than just using stand-alone tests because this enables detection of co-infections, which are significantly associated with risk of disease. Slovis said, "Just because a test shows positive for an infectious agent does not mean this is the primary cause of the illness."

Be sure to look for unexpected sources of contamination that might cause disease. And, as is the case with most infectious diseases, prevention is the best cure and is best accomplished when horse owners and barn managers implement excellent biosecurity and hygienic practices on the farm.

### References

- 1 Frederick, J., Giguère, S. and Sanchez, L.C. (2009). [Infectious Agents Detected in the Feces of Diarrheic Foals: A Retrospective Study of 233 Cases \(2003–2008\)](#). *J Vet Intern Med*, 23: 1254–1260. doi: 10.1111/j.1939-1676.2009.0383.x
- 2 Slovis NM, Elam J, Estrada M, Leutenegger CM. [Infectious agents associated with diarrhoea in neonatal foals in central Kentucky: a comprehensive molecular study](#). *Equine Vet J*. 2014 May;46(3):311-6.