

# Down on the Farm



## Insidious Salmonella

*This microscopic invader is an equal-opportunity infector. Are your horses at risk?*

by **KAREN BRIGGS**

We tend to hear about Salmonella in relation to lectures on kitchen hygiene—it's one of the main reasons why we're warned to wash our hands vigorously after handling raw chicken. But chickens aren't the only species which can become infected with this bacterium. Your horse might be vulnerable, too.

According to Roberta Dwyer DVM, MS, Dipl. ACMPM, Associate Professor at the University of Kentucky's Gluck Equine Research Center in Lexington, Kentucky, there are over 2,200 serotypes of Salmonella present in the environment. They're in the water, the soil and the equine gut. They're extraordinarily resilient, sometimes lingering in the environment for years. And all but a few types are transmissible to humans.

Even though it's ever-present, under normal conditions Salmonella may have little influence on your herd's health. But if a horse is stressed and his immune system is operating at less than full capacity, the bacteria can sneak in and strike.

Its most common mode of attack in adult horses is the gastrointestinal tract, where it causes acute or chronic

diarrhea. In an acute case, the horse may have manure that's loose, liquid, foul-smelling and sometimes bloody—and he'll also show signs of fever, dehydration, and a hypermotile bowel which emits characteristic "crackling" or "tinkling" sounds. For most horse-owners, these are tip-offs for instant action.

Horses with Salmonella may also demonstrate chronic, milder symptoms such as mild depression and "cow patty" manure, which may not be obvious danger signs. They should be taken seriously because, left untreated, what appears to be a simple case of 'the runs' might quickly lead to potentially fatal dehydration and electrolyte imbalances. Weight loss, laminitis and kidney shutdown are other risks of a severe episode of Salmonella-triggered dehydration. The liquid manure is also extremely infectious, and can trigger a farm-wide outbreak of disease in your horses—or in your own intestinal tract. "When it causes problems, it causes big ones," says Dwyer.

In foals, Salmonella is a major threat. Not only can it create bacterial diarrhea (very dangerous, because a foal doesn't have the fluid reserves of an adult horse and can dehydrate in as little as eight hours), but it also has a

nasty habit of entering the system through the umbilical stump and causing a bacterial infection we call "navel ill" or "joint ill". In joint ill, a foal will suddenly exhibit lameness associated with a warm, painful enlargement of one or more of his leg joints. He may also become depressed, lose his appetite and run a fever. Fluid drawn from the affected joint capsule may be orange-brown instead of the usual light straw color, and cloudy rather than translucent. Left unchecked, joint ill can cause both destructive bony changes in the joint(s) and life-long arthritis.

What's designated as joint ill is usually localized to one or two joints, but there's also the possibility of Salmonella spreading throughout the body, causing a general septicemia, or lodging in the respiratory system, where it can trigger bacterial pneumonia. Either situation may sneak up very suddenly on an unsuspecting foal—Dwyer has known cases where a foal was apparently robust and healthy one day, but dead the next. Even eye infections can be caused by opportunistic Salmonella. Any way that you slice it, Salmonella can mean a critically ill foal.

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## DOWN ON THE FARM Cont.

Adult horses can sometimes suffer from “sub-clinical” cases of Salmonella too. Mysterious bone and joint infections, subcutaneous abscesses and pneumonia, can all be triggered by Salmonella which has entered the system through an open wound or through inhalation. In cases like this, your veterinarian will need to isolate the causative organism, for Salmonella is only one of a host of bacterial pathogens which can produce similar symptoms.

### A Slippery Little Organism

Salmonella is contagious, ubiquitous in the environment and adaptable. It's frequently resistant to antibiotics, which can make it difficult to treat. Salmonella can even adapt itself from horse to horse—so if you have an outbreak on your farm, the antibiotic you use to combat the infection in the first stricken horse may do nothing for horse number five. “Some Salmonella strains are susceptible to several different antibiotics,” says Dwyer, “while others are resistant to all but a couple. Your veterinarian may need to do repeated sensitivity tests on the cultures drawn from each case to determine which drug is the best choice. Many owners don't understand that the purpose of this is not just to pad the bill!”

It's impossible to predict how virulent a strain of Salmonella will be. Many horses go through a few days of being under the weather and then shake it off, while others may find themselves with a life-threatening condition, the onset of which can be gradual or sudden. Some horses even become ‘carriers,’ shedding the bacteria into the environment in their manure, without ever demonstrating any symptoms of the disease themselves. “That's the thing about this disease,” says Dwyer. “(Horses have) a highly variable response to it. It can be mild, or asymptomatic. . .or seriously nasty.”

Because of the vast number of serotypes of Salmonella out there in the soil, the water and the air, it's next to impossible to formulate an effective vaccine against the bacterium. You

may be able to protect against one, or even a couple of dozen serotypes, but you can't protect against 2,200 of them. That said, there is a vaccine available in Australia which is commonly administered to broodmares—

## Preventing Salmonella's Spread

- Fecal material from rodents and birds can spread the bacteria, so keep your grain in rodent-proof containers and do your best to dissuade birds from roosting above your horse's water and feed buckets.
- Test your water sources for fecal coliforms, especially if there are large poultry or swine farms, or sewage treatment plants, in your immediate area.
- Quarantine any horses new to the herd for at least a couple of weeks, and avoid spreading manure from these horses in areas where your established herd could be exposed.
- Since foals are especially vulnerable to Salmonella, build foaling stalls with easily-disinfected materials (that is, concrete rather than wood) and then disinfect these surfaces regularly.
- Avoid feeds which include animal sources of fat (such as tallow) or protein (such as bone, fish or feather meal). Most quality horse feeds won't include these ingredients, but some cheaper feeds and cattle rations may.
- Keep your manure pile isolated from areas where horses graze.
- If possible, pick up manure in your pastures, or drag the fields with a chain harrow to break up manure piles and expose them to sunlight (ultraviolet rays help kill the bacteria).

veterinarians “Down Under” do feel it's of some help against certain serotypes, though it's unlikely to provide 100 percent protection against any of them.

## Halt! Who Goes There?

Faced with a mystery infection on your farm, your veterinarian will want to do a culture as soon as possible to positively identify the culprit and determine the most effective treatment. Cultures can be taken from a fecal sample, the blood or joint fluid, depending on the nature of the disease.

Because lab cultures may take a couple of days, however, your vet may take action even before the results come back. In the case of a horse with diarrhea, replacement fluid therapy (usually intravenously, for more rapid absorption) is the first line of defence. Anti-inflammatories, designed to help bring down the fever, may also be recommended. But administering antibiotics may or may not be a good idea. Why? Antibiotics tend to kill bacteria indiscriminately—the good along with the bad. It's suspected that one of the main ways in which Salmonella takes hold is when populations of ‘good’ bacteria in the equine hindgut are compromised—as a result of a high-grain, low-forage diet, from the stress of hard training or shipping, from a heavy parasite burden, or any number of other factors. When populations of beneficial bacteria die off, opportunistic pathogens such as Salmonella can quickly gain a foothold. So, in cases of bacterial diarrhea, administering antibiotics often only exacerbates the problem!

The case for using antibiotics is clearer when you're treating a foal with joint ill or septicemia. But Dwyer emphasizes, “It must be your vet's decision. The wrong antibiotic can worsen the condition.” Once Salmonella has been positively identified as the cause, sensitivity tests can help define which antibiotics are most likely to be effective—and the results may prompt your vet to change his or her choice of drugs to treat your horse.

Because dehydration is such a serious concern, horses with bacterial diarrhea almost always benefit from replacement fluid therapy. “IV fluids is the quickest way to see results,” says Dwyer. “You can see them perk up. You can administer fluids by nasogas-

tric tube, too, but it's slower and you can only give them so much—a foal's stomach can get distended and even an adult horse's stomach is quite small and can't absorb a lot." The electrolytes sodium, potassium, chloride and calcium will be out of balance with a dehydrated horse as well. "You need to balance these out but not over-correct," Dwyer says. "Bloodwork can give you a lot of information here. Your veterinarian will also probably want to check for anemia, levels of glucose and protein, liver enzymes and BUN (Blood Urea Nitrogen)—which can all indicate problems with kidney function, thanks to a buildup of toxins in the body."

Anti-diarrheal medications, such as kapectate or activated charcoal, are sometimes prescribed for horses with bacterial diarrhea, as are probiotics which can help re-populate the gut with beneficial bacteria. In severe cases, plasma transfusions are sometimes used to help re-establish normal plasma protein values in the blood.

When your vet suspects Salmonella is at work on your farm, quarantine all of the affected horses. If you have access to a large animal veterinary hospital, placing them in isolation units there may be the best choice. Quarantine can also be done at home, but it requires dedication and vigilance. Because Salmonella has the potential to spread not only from horse to horse but also to you and your family, you'll need to designate only one person to handle the affected animals. "Wear latex gloves, put disposable covers on your boots and isolate all of the equipment that you use around the sick horses," Dwyer advises. "Don't allow someone whose immune system is compromised—a young child, someone who has lupus or who's recently had chemotherapy, for example—to be exposed. Handle the affected horses only after you've handled the healthy ones, and don't go back to the healthy ones till you've been thoroughly disinfected, washed your hands and changed clothes.


"Treat all cases of diarrhea as contagious and think about where that manure is going. You can track it throughout the barn very easily, or

expose your healthy horses to it if you spread it through their fields or living environment." Even horses who suffer from joint ill or septicemia may still shed Salmonella in their manure—it doesn't need to be liquid to be contagious.

Presuming your horse does fight off a Salmonella infection successfully (and up to 90 percent do, with prompt veterinary intervention), he may continue to shed the organism from his system for some time afterwards. So it's a mistake to turn an apparently-recovered horse back out with the herd. Instead, maintain him in quarantine

for at least 30 days, culturing fecal samples and/or blood for evidence of Salmonella a few times a week, until the horse has three to five consecutive 'clean' samples. "There used to be serious concerns that some horses would be permanent carriers," Dwyer says. "Twenty years ago, horses were sometimes euthanized for fear that they'd be chronic contaminants to the rest of their population. I don't think that stigma is there so much anymore, because we can run the cultures and demonstrate when he's no longer shedding the organism."

**Ken Arnold**  
*RANCH*



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