

## ***Appendix 1: Discharge Information for Horses with Salmonella*** **Infection Control Measures for *Salmonella* in Horses**

### **General Information**

*Salmonella* is a bacterium that is an important cause of disease in horses and other species (including people). Diarrhea is the most common disease that develops in infected animals, however fever and depression may be the only signs in some horses that get sick, while others can carry *Salmonella* without showing any signs whatsoever. *Salmonella* is transmitted via the 'fecal-oral' route, meaning that *Salmonella* is present in manure and must be ingested to infect other animals (or people). A small percentage of horses transiently carry *Salmonella* in their intestinal tracts at any time, typically without any problems. These horses can be sources of infection for other horses, and for subsequent development of disease in themselves.

*Salmonella* infection is diagnosed by culture of fecal samples. However, testing of a single fecal sample will not always detect *Salmonella*, and 5 negative samples are required to confidently determine that *Salmonella* is not present.

### **Management of a *Salmonella* positive horse on the farm**

Sometimes, it is necessary for an infected horse to move onto, or return to, a farm. Because *Salmonella* is an infectious agent, certain precautions should be put in place to reduce the risk of infecting other animals or people. *Salmonella* outbreaks are uncommon on horse farms but can occur. Similarly, transmission of *Salmonella* to people on farms is uncommon but possible. Therefore, care should be taken to *reduce the risk* of this happening.

**Note:** These are general guidelines only. An infection control program needs to be catered to the challenges and needs of each farm. It is wise to discuss infection control plans with your veterinarian or Ontario Veterinary College personnel.

1. The horse should ideally be housed in an isolated barn, away from other horses. If this is not possible, it should be in a stall as far away from other horses, particularly sick horses, pregnant mares and foals. Alternatively, it could be kept in an isolated pasture or paddock, with no contact with other horses.
2. The stall should be adequately identified as containing an infectious horse to keep other people away.
3. The horse should remain in its stall as much as possible; all the time if feasible. It should not be allowed into any public areas. If walked, it should be walked in an area that horses and people will not be using. If the horse passes any manure, it should be cleaned up promptly.
4. When the horse is handled or the stall is entered, 'barrier precautions' should be used. This means using disposable plastic overboots or boots that are only worn in the stall, disposable gloves, and coveralls or similar protective outerwear that is only used in the stall. Plastic overboots should be disposed of after every use. If other boots are used instead, they should be removed after exiting the stall and cleaned and disinfected.

5. A garbage bag should be placed immediately outside the stall for all disposable items.
6. After entering the stall or handling the horse or stall items, it is essential to wash your hands with antibacterial soap or use an alcohol-based hand sanitizer.
7. Buckets, shovels, pitchforks, wheelbarrows and other items should not be moved between an infected horse's stall and other stalls without thorough disinfection.
8. For disinfection of items, they must be cleaned, then treated with an appropriate disinfectant. A 1:10 dilution of household bleach (1 part bleach to 9 parts water) is an effective disinfectant in the absence of dirt, manure or other debris. 10-30 minutes of contact with the bleach solution is required. Other disinfectants can also be used. It is important to ensure that you are using a disinfectant (which is designed to kill bacteria) versus a cleaner (which will not kill bacteria, just facilitate removal of debris).
9. Most stalls cannot be easily disinfected. Dirt, unsealed wood surfaces and porous materials complicate cleaning and disinfection. When the stall is no longer needed, it should be thoroughly cleaned and disinfected, and left empty for as long as possible. To make wooden stall walls easier to disinfect, they can be painted with 2 coats of marine varnish to seal the surface.
10. Manure should be disposed of in an area away from other animals, and where run-off will not contaminate the water supply. Composting is an effective way of killing *Salmonella*.
11. *Salmonella* is killed by sunlight, but only if sunlight can penetrate it. If an infected horse passes manure outside, manure should be picked up and sunlight allowed to kill any residual *Salmonella*. If an infected horse is on pasture, manure should be picked up or the pasture harrowed frequently. If the pasture is harrowed, the tractor and harrow should be considered infectious until disinfected.
12. Periodic (1-2/week) fecal samples should be submitted for *Salmonella* culture. Once a negative culture is obtained, samples can be collected daily until 5 consecutive samples have been obtained, at which point the likelihood that the horse is still shedding *Salmonella* is very unlikely. Please discuss the logistics of sample collection and submission with your veterinarian.
13. When no longer required for an infectious horse, items such as buckets, twitches, lead ropes, hay nets and any other in-contact item should be disinfected or disposed of.

## Frequently Asked Questions

### 1) Do all horses with *Salmonella* get sick?

**No.** Most horses that are exposed to *Salmonella* will not become infected. Even if *Salmonella* survives in the intestinal tract of a horse, disease does not necessarily develop. The likelihood of disease depends on the number of *Salmonella* that are ingested, the *Salmonella* strain, and the health status of the horse. Healthy adult horses usually require very large numbers of *Salmonella* to get sick. However, if they are being treated with antibiotics, held off feed, undergo general anesthesia, have feed changes, are shipped or encounter other stressors, they are more likely to get sick with lower doses.

### 2) How long will my horse continue to shed *Salmonella*?

Most horses only shed *Salmonella* for a ***reasonably short period of time***. In some cases, horses can shed for a few months, but lifelong shedding is not recognized. It is impossible to predict whether a horse will shed *Salmonella* for a few days versus a few months.

### 3) Is my horse at risk of infecting other horses upon return to the farm?

**Yes**, however the risk is probably not great in most circumstances. Most clinically normal horses (i.e. without diarrhea) shed relatively low levels of *Salmonella*. Further, most horses on farms are a relatively low risk for disease because they don't have the risk factors described above. However, we still recommend taking precautions to ensure that your horse does not transmit disease. These are described above.

### 4) Can *Salmonella* infect people?

**Yes.** *Salmonella* is a zoonotic disease. That means it can be transmitted from animals to people. People can become infected by ingesting *Salmonella* from a horse. As with horses, healthy people are reasonably resistant to infection with low levels of *Salmonella*. People with poor immune system function (caused by certain diseases or drugs), and those taking antibiotics, are at greater risk. High-risk people (immunocompromised, antibiotic-treated, very young, very old) should not be allowed to come into contact with infected horses, regardless of the infection control protocols that are in place. Good personal hygiene (especially hand hygiene) and use of infection control protocols can greatly reduce the risk of transmission of *Salmonella* to people.

### 5) What can be done to shorten the length of time my horse sheds *Salmonella*?

**Nothing specific** can be done. Antibiotics are not effective at eliminating carriage of *Salmonella* and might increase the risk of developing diarrhea. Probiotics have not been shown to be effective. Probably the best thing that can be done is to provide the horse with a good diet, good management and limiting stress.