

Salmonella *Dublin* – What Is It?

Why is this important?

The University of Saskatchewan Rayner Dairy herd recently experienced a *Salmonella Dublin* outbreak. *S. Dublin* poses significant risk to the health and productivity of dairy, veal, and beef herds, as well as human health. There are currently no data available on prevalence of *S. Dublin* in Canada. However, we are beginning to look for these bacteria more often and discovering that it appears to be more prevalent than previously thought with many herds containing carrier animals. In the USA, *S. Dublin* is especially prevalent in large herds and custom heifer raising and veal facilities due to the mixing of animals from multiple farms and the sometimes higher-stress conditions of the facilities.

What is *Salmonella Dublin*?

Salmonella Dublin (*S. Dublin*) is a type of bacteria that is host-adapted to cattle, meaning that it thrives best in bovine species. It does not always present as diarrhea. Instead, it more commonly presents as pneumonia or respiratory illness. *S. Dublin* typically affects young calves and can be deadly when transmitted to naïve herds.

Young calves take up the bacteria orally from their environment, as it is shed in feces, urine, milk, semen, and vaginal secretions. Typically, a producer will see very sudden onset of the illness, lethargic calves, high fevers (as high as 106-107 °F), septicemia, and heavy breathing with or without diarrhea. Upon introduction into a herd, many calves are likely to die, but mortality will decrease as herd immunity builds.

Post-mortem examination shows enlarged lungs, swollen livers, and enlarged spleens. This is due to bacteria leaving the intestine and travelling through blood and lymph to these organs. A veterinary diagnostic lab will be able to isolate and grow the bacteria from tissue samples collected from calves and/or fecal samples. Diagnostic labs will also be able to conduct antibody testing (looking for antibodies to *S. Dublin*). Bacteria cannot be isolated from fecal material unless it is being shed at that time. As with many forms of *Salmonella*, an animal may be a carrier (not showing clinical signs; approx. 5-20% of previously affected calves) and will not always shed the bacteria. Other forms of testing may be required to identify sick or carrier animals.

How do we treat it?

S. Dublin is multi-drug resistant and there are very few approved medications that will work on these bacteria. Veterinarians agree that there is very little overall success when treating animals with antibiotics. Instead, producers should focus on prevention and control of transmission.



How do we prevent it?

Health

Monitoring and maintaining calf health will prevent transmission of *S. Dublin* and minimize the impact if infection occurs, as healthy calves have better immune function. Remove calves promptly from the calving pen and provide high quality, pasteurized colostrum to calves at birth. Provide a diet of clean milk replacer or pasteurized milk as well as high quality calf starter and water. Producers may want to consider supplementing transition cows and calves with a probiotic that has good activity against *S. Dublin*. If calf mortality is high due to “pneumonia”, it is worth conducting a necropsy to determine the cause.

Biosecurity

On-farm biosecurity should focus on animal and human movement, both within and between farms and facilities. Purchasing animals is a major risk factor in introduction and transmission of *S. Dublin*. Ideally, a producer should pre-screen replacement animals with antibody tests and/or fecal cultures or purchase animals from herds

with known disease status. Additionally, transport animals using clean, disinfected trucks and isolate/ quarantine the animal for a period of several weeks. With respect to human movement, work with your veterinarian, service providers, and other farm visitors to ensure that these individuals follow proper biosecurity protocols on your farm and are not a source of infection. Also consider transmission between areas of the farm. For example, the Rayner Center has purchased a second set of boots for their staff that are to be worn only in the calf barn.

Sanitation Protocols

Proper cleaning of the calving pen and calf pens is essential and should include cleanout and disinfection between each animal. It is important to use products that disrupt the biofilm (which contains the bacteria) and to ensure contact time that will kill the bacteria effectively. Studies have shown that a pen that is cleaned, with fresh bedding, but not disinfected only requires 24 hours before there is enough *Salmonella* in the new bedding to make a calf sick. Additionally, when cleaning, it is important to remember to use low water pressure, as high-pressure washing can lead to the spread of bacteria.



Summary Points

- *Salmonella Dublin* poses a risk to animal and human health.
- *S. Dublin* commonly presents as sudden onset respiratory disease with high fever, with or without diarrhea in calves.
- *S. Dublin* is multi-drug resistant and difficult to treat effectively.
- Producers should focus on prevention of *S. Dublin* through biosecurity protocols, sanitation, and optimization of calf health.