

Diarrhea in Adult Does? It could be *Yersinia enterocolitis*.

By: Dr. Michelle Arnold

Diarrhea in adult sheep or goats is almost always attributed to parasites (gastrointestinal worms other than *Haemonchus contortus* or “Barberpole” worm), coccidiosis, a bacterial infection such as Salmonella, or a nutritional cause. However, a disease associated with decreased milk production, watery diarrhea, and that most often occurs in cooler months may be due to the bacterium *Yersinia pseudotuberculosis*.

Yersinia pseudotuberculosis enterocolitis caused the deaths of multiple adult does from separate farms in the spring of 2018. The affected does had watery diarrhea for three to seven days (sometimes longer) before death. In all reported cases, the owners suspected parasites or coccidiosis, but there was no response to treatment for these disorders. Early treatment with antibiotics saved a portion of the sick animals. Several dead animals were submitted to the University of Kentucky Veterinary Diagnostic Laboratory for necropsy (an animal “autopsy”). Severe abnormalities were found in the intestine both on gross examination (can be seen with the naked eye) and histologic (microscopic) examination. The *Yersinia pseudotuberculosis* bacterial organism was isolated by culture from the intestine in all of the cases. Concurrent problems included copper and selenium deficiencies, and gastrointestinal parasitism. Interestingly, the California Animal Health and Food Safety (CAHFS) Laboratory newsletter reported several cases in does last February (2018) describing similar clinical signs, necropsy findings, and they, too, cultured the same *Yersinia* organism.

So what in the world is “*Yersinia enterocolitis*” and how did it get here?

“Enteritis” or “enterocolitis” is a veterinary term for inflammation and infection within the intestines. Watery diarrhea is the most common clinical sign, but infection with *Yersinia* species can also result in mastitis, abortion, abscesses

and conjunctivitis. Rodents and birds are considered carriers or reservoirs for this bacteria. Goats are infected by ingesting feed or water contaminated with the organism, often from the feces of another infected goat. This is referred to as a “fecal-oral” route of transmission. There have been reports of a possible seasonality, with cases more common in the winter and spring. Typically, either single animals or small groups are affected, and it can be seen in adults or young stock. It has been suggested that stress related to weather (cold, wet, windy), lactation, trace element deficiencies, parasites, or shipping are necessary for disease to develop. The only way to definitively diagnose it, unfortunately, is through necropsy and identification of the characteristic lesions by a pathologist. In a live animal, a fresh fecal sample submitted to the lab for bacterial culture and parasites may yield potential causes of the diarrhea.

There are two species of *Yersinia* that can be pathogenic (disease-causing) in small ruminants. Previous research in Australia in weaned lambs found outbreaks associated with *Y. pseudotuberculosis* occurred only in winter while those associated with *Y. enterocolitica* occurred throughout the year. In winter, the researchers observed a progressively increasing number of cases during an outbreak of scours so, it is likely that pasture or barn contamination, along with environmental survivability during cooler months play an important role in fecal-oral transmission of *Yersinia* species within affected populations. Consequently, areas of overcrowding (especially within barns and pens), feeding on the ground where fecal contamination is possible, and areas where feed and water sources may be contaminated by wildlife feces (such as rodents or raccoons) are at highest risk for disease. During the summer and autumn, outbreaks were only associated with *Y. enterocolitica*. Although either type of bacteria only survives for short times in high temperatures, outbreaks can occur when a high proportion of animals are

shedding the bacteria and when stocking rates are high. In August 2018, several cases of *Y. enterocolitica* enteritis were diagnosed in adult does submitted to the University of Kentucky Veterinary Diagnostic Laboratory.

Treatment

Although treatment with sulfonamides (“sulfa boluses”) is often used for scours, they are not very useful for bacterial enteritis associated with *Yersinia* species. The use of oxytetracycline, together with management interventions such as decreasing the stocking rate, feeding off the ground to eliminate fecal contamination, and moving affected groups into areas with a lower risk of bacterial contamination is likely to be a more effective and sustainable approach. This bacterium is zoonotic (can cause disease in people). In human beings, the disease is considered a food-borne infection and several individual cases or community outbreaks have occurred in the past decades after ingestion of contaminated milk products, undercooked or raw meat, and fresh vegetables. Good hygiene including hand washing and changing clothes after handling sick animals is a must. Remember this organism, as well as many others, gains entry by contaminated feed or water so, protection of these sources from feces, especially from wildlife, would be of value to prevent disease introduction.

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