



# Johne's Watch

*A monthly bulletin for livestock producers*

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## Introduction to Johne's Disease

**J**ohne's disease was first identified in the U.S. dairy industry over 100 years ago, yet many producers are still unfamiliar with this serious, infectious disease.

Johne's disease, is a chronic, infectious disease which affects domestic and exotic ruminants including dairy and beef cattle, sheep, goats, cervids and camelids. It has been called one of the most serious diseases affecting cattle today.

The disease is caused by *Mycobacterium paratuberculosis*, a slow-growing bacteria. This bacterium invades the animal's small intestine causing a thickening of the intestinal wall, reducing the absorptive capability of the intestine.

According to researchers at Michigan State University, the bacteria are taken up by specialized cells in the small intestine. As the body tries to rid itself of these bacteria, the immune response causes a thickening of the intestinal lining, preventing it from functioning normally. This leads to poor absorption of nutrients and eventual diarrhea. As a result, although animals may be feeling and eating well, they begin to lose weight.

Because of the slow, progressive nature of the infection, signs of Johne's disease may not be seen until years after the onset of infection. The clinical signs of Johne's can be easily confused with several other diseases, including intestinal Parasitism, malnutrition, salmonellosis, hardware disease and winter dysentery. The most definitive way to determine the presence of Johne's is through testing.



## Clinical Signs

Clinical signs in cattle, include profuse watery diarrhea, weight loss, and lowered milk production. Appetite will stay the same or increase. Some animals may have a low-grade fever, and develop edema under the jaw (bottle jaw).

Johne's disease in a herd is said to be a silent disease. It may loom in the herd for years before a clinical case surfaces. The presence of infection in the herd is hard to detect until the disease has progressed to the second or third stage.

## Stages of Disease

All cases of Johne's ultimately progress through the four stages of development until the animal dies or is culled.

Stage 1 is silent, subclinical and non-detectable. Infected calves and animals younger than two years of age, or those exposed to a small dose of bacteria, which do not show symptoms, are in this category.

Stage 2 animals are generally older heifers or adults that may appear healthy. However, these subclinical shedders are generally passing enough organisms in their manure to be detected by fecal culture test. These animals pose a risk to others in the herd by contaminating the environment.

Stage 3 animals have visible symptoms of Johne's disease. They have acute or intermittent watery diarrhea, weight loss, and a drop in feed efficiency and milk production. Intermittent signs at this stage usually progress to more severe infection.

Stage 4 is the end of the disease process. Most animals appear very thin, with fluid diarrhea. Animals may progress from Stage 2 to Stage 4 in just a few weeks.

## Onset of Infection

The *M. paratuberculosis* bacteria are usually introduced to dairy herds through the purchase of infected though clinically normal cattle (Stage 2). Once the bacterium is introduced to the herd, it can spread quickly through contaminated feces.

The time from initial infection to onset of clinical signs (diarrhea and weight loss) is generally two to five years. Calves are the most susceptible to infection with the Johne's organism, especially in the first few weeks of life. Animals greater than one year old may acquire *M. paratuberculosis* infection but are more resistant to infection than young calves.

The South Dakota Extension Service reports that animals infected with *M. paratuberculosis* eventually shed the organism in the manure, with the number of organisms increasing over time. Cattle showing clinical Johne's disease shed a tremendous number of organisms into the manure, resulting in heavy environmental contamination.

The vast majority of infections in young animals are acquired by ingestion of *M. paratuberculosis*. This happens when they consume manure containing the bacterium. Sucking on manure contaminated teats on the udder of their mother, licking contaminated bars in the stall where they are born, or being housed in a location where they have access to manure from the adult herd are all ways young animals have opportunities to ingest this bacterium.

A second method of exposure is by drinking infected milk. *M. paratuberculosis* is excreted in the milk of infected lactating animals, particularly when the infection is in the more advance stages. When colostrum is pooled among animals, there is a risk of spreading the bacteria from one infected animal to several newborn calves.

Animals that spend a lot of time with their mothers and nurse naturally have the highest risk of becoming infected. On dairies where calves are normally removed from cows and housed separately, the practice of feeding whole milk instead of artificial milk replacers can result in the spread of *M. paratuberculosis*.



## Prevalence

A third, but less common, route of infection is in utero. In later stages of the disease, the bacterium can spread from the small intestine to other parts of the body. In advance stages of the disease, the bacterium can travel to the fetus of a pregnant animal.

**R**esearch conducted at Michigan State University in 1999 predicted that 55 percent of Michigan's dairy herd have two or more animals carrying Johne's disease. Likewise, in Wisconsin, research in 1994 found that an estimated 34 percent of the dairy herds had indications of the disease.

Because only an estimated 1 percent of the infected animals actually exhibit clinical signs, researchers refer to an iceberg effect when diagnosing the disease. What actually surfaces is only the tip of what is in the herd. For every clinical animal, there are 5 to 15 infected animals at the subclinical level.

## Continuing Information

**I**ncreasing awareness of Johne's disease among producers and veterinarians is key in helping control this serious disease. In-depth information regarding Johne's will be presented each month in this bulletin.

Upcoming issues will address control measures on the farm, the economic impact of Johne's disease, management strategies and testing procedures. If you have additional questions please contact AntelBio at 1.800.631.3510.

## References

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Information was compiled from resources including:

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Ohio Department of Agriculture (2000) Johne's disease.

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Web Sites of Interest: [www.vetmed.wisc.edu](http://www.vetmed.wisc.edu) and [www.aphis.usda.gov](http://www.aphis.usda.gov)