

Frequently Asked Questions about Johne's Disease

What is Johne's disease and what kind of animals get Johne's disease?

Johne's (pronounced "Yo-nees") disease is a contagious bacterial disease of the intestinal tract. A German veterinarian first described the disease in a dairy cow in 1895; his name is used as the common name for the disease. The disease is also called paratuberculosis. Johne's disease occurs in a wide variety of animals, but most often in ruminants. Ruminants are hooved mammals that chew their cud and have a 3-4 chambered stomach. Some of the more common ruminants are: cattle, sheep, goats, deer, antelope, and llamas. Johne's disease has been reported in all of these animals but is most commonly seen in dairy cattle.

What causes Johne's disease?

The bacterium that causes Johne's disease is named *Mycobacterium paratuberculosis* often the name is abbreviated *M. paratuberculosis*. It is a relative of the bacterium that causes tuberculosis in humans and animals. *M. paratuberculosis* only grows in animals: it can not grow and multiply in nature. However, if soil or water is contaminated with this bacterium, it can survive over a year because of its resistance to heat, cold and drying.

What are the signs of Johne's disease and how can I tell if my herd has Johne's disease?

Animals infected with *M. paratuberculosis* usually develop diarrhea and rapidly lose weight. However, in some animals, like sheep, goats and deer, diarrhea is less common. In general, Johne's disease is a wasting disease although infected animals continue to eat well. Infected animals appear unthrifty, are often weak, but they do not generally have a fever. The signs of Johne's disease can be confused the signs with several other diseases. Because of the slowly progressive nature of the infection, signs of Johne's disease are usually not seen until animals are adults. In infected dairy cattle, signs of Johne's disease commonly start within a few weeks after calving in the cow. In heavily infected herds, however, signs of Johne's disease can occur in heifers prior to calving.

Dairy herds with Johne's disease may have an occasional animal with diarrhea or weight loss, but a common complaint is that the herd production is going down or not as high as it should be. Herd nutritionist sometimes notice the problem when herd production is less than expected, given the quality of the feed and cows. As part of a plan to determine the cause of low herd production, tests for Johne's disease on several of the poor-doing animals should be considered.

How common is Johne's disease?

In the U.S. a national survey estimated that 1.4 percent of the nation's beef cattle and 2.6 percent of the country's dairy cattle are infected with *M. paratuberculosis*. Some areas of the country report much higher infections rates, however. In northern dairy states like Minnesota, Wisconsin, Michigan, Ohio, Pennsylvania, and New York, it is estimated that roughly 10 percent of dairy cattle are infected with *M. paratuberculosis*. In a blood test survey done in Wisconsin, one-third of herds tested positive: had one or more test-positive animals. Infection rates in beef cattle, sheep and goats are thought to be lower, but the disease is still commonly seen in these animals. Exotic ruminants kept in zoos, like antelope from Africa, have also gotten Johne's disease.

What causes the signs of Johne's disease?



M. paratuberculosis infects part of the small intestine called the ileum. There it causes a certain kind of inflammation called granulomatous inflammation. This inflammation thickens the intestinal wall, preventing it from functioning normally. This leads to diarrhea and poor absorption of nutrients. As a result, even though animals will seem to be feeling and eating well, they will rapidly lose weight.

How do animals get Johne's disease?

Johne's disease typically enters a herd of animals when an infected, but healthy-looking, animal is bought. The infection then spreads to other animals without the owner's knowledge. Eventually, often after several years, the owner recognizes signs of the disease in a number of animals.

Individual animals get infected by close contact with other infected animals. Most often, the infection is acquired by eating material contaminated with M. paratuberculosis when animals are very young. Young animals are far more susceptible to infection than are adults. Ingestion of the bacterium occurs when the newborn's environment is contaminated with manure from an infected animal, or by drinking milk from an infected animal. The bacterium passes out of infected animals primarily in the feces, but in the later stages of the infection it is also found in the milk of dairy cattle and presumably the milk of other animals too. After infection, many months or years go by until the infected animals shows signs of Johne's disease.

How can you prevent your animals from getting Johne's disease?

The best way to avoid this chronic infectious disease is to be as certain as possible that animals brought into the herd are not infected with M. paratuberculosis. This is not always easy. Laboratory tests for cattle are more widely available than for sheep, goats or zoo animals. Still, some type of test is available for every animal. When using laboratory tests for pre-purchase screening of animals, it is important to understand that tests done on individual animals are not 100 percent sensitive, meaning they can't detect 100 percent of all infected animals. A way to get around this problem is to rely on tests done on the herd of animals from which you want to buy. If a whole herd test is 100 percent negative, then the probability the herd is free of M. paratuberculosis infection is very high. Johne's disease test-negative herds are the best sources of animals for purchase.

How do you test animals for Johne's disease?

There are three common ways to test animals for Johne's disease: culture of fecal samples, DNA probe on fecal samples, and blood tests for antibodies to M. paratuberculosis.

- Culture of the M. paratuberculosis from fecal samples.

All animals can be tested for Johne's disease by doing a bacterial culture of a fecal (manure) sample. Your veterinarian can help collect and submit samples for a Johne's fecal culture. This test takes up to 16 weeks because of the extremely slow growth rate of M. paratuberculosis and typically costs \$10 to \$20 per sample.

- DNA probe on fecal samples.

M. paratuberculosis bacteria can be detected in fecal samples by use of sophisticated DNA probe tests. DNA probes are much faster than culturing the organism and can be done within three days. Unfortunately, the commercial kit for doing the DNA probe is only able to detect infected animals when their infection has progressed to the stage where large numbers of M. paratuberculosis are being excreted in the feces. Therefore, animals in early stages of the infection are not detected. The other disadvantage of the DNA probe for Johne's disease is that it is expensive to run, costing roughly \$25 per sample (although the price charged may be lower in states that subsidize testing through their veterinary diagnostic laboratory).

- Blood tests for antibodies to M. paratuberculosis.



There are several blood tests for Johne's disease. The ELISA is the one considered most accurate and best standardized. This test is licensed for detection of *M. paratuberculosis*-infected cattle by the U.S. Dept. of Agriculture. The ELISA is fast, simple, inexpensive (about \$5.00 per animal) and able to detect animals that are infected before they show signs of Johne's disease. Many veterinary diagnostic laboratories offer the ELISA for Johne's disease. For animals other than cattle, adaptation of the ELISA is in progress and will, likely, soon be available.

How do you control Johne's disease in a herd?

Methods for control of Johne's disease in animal herds or flocks depends on the type of husbandry. In principle, two strategies must be employed at the same time; 1) newborn animals must be protected from infection by being born and raised in a clean environment and fed milk absolutely free of *M. paratuberculosis*, and 2) adult animals carrying the *M. paratuberculosis* infection must be identified by laboratory tests and removed from the herd. For dairy cattle this means calving on clean pastures or in clean and disinfected maternity pens, using colostrum only from Johne's test-negative cows, and feeding artificial milk replacer to calves until weaning since the bacterium can be found in milk. Infected dairy herds should be tested for Johne's disease once a year and test-positive cows should be culled at the end of their lactation.

Can Johne's disease be cured with antibiotics?

Although few studies have been reported, Johne's disease is probably not curable. If it can be cured, it will likely require use of multiple antibiotics administered for a year or longer. For most animals, this is cost prohibitive.

Can humans get Johne's disease?

This is a very controversial subject. There is a human disease called Crohn's disease that resembles Johne's disease. Crohn's disease most commonly affects people 15 to 35 years old. It is a chronic diarrheal disease that has no known cause and no known cure. Recent reports in the medical literature indicate that 50 to 75 percent of patients with Crohn's disease test positive for *M. paratuberculosis*. A few laboratories have grown *M. paratuberculosis* from a few Crohn's patient specimens. However, no connection has been shown between contact with animals with Johne's disease or milk consumption and Crohn's disease.

An extensive website dedicated to the theory that *M. paratuberculosis* does cause Crohn's disease was created by Mr. Alan Kennedy, an information technology consultant with Crohn's disease living in Ireland. This site presents one perspective on this controversial question. It is an excellent source of background information about Crohn's disease with several links to related websites. The website also provides full text access to recent publications on *M. paratuberculosis* and Crohn's disease.

If my dairy herd has Johne's disease, should I drink the raw milk?

Given the present lack of knowledge about whether *M. paratuberculosis* can infect humans, it is better to be safe and not drink raw milk from infected herds. It should be noted that drinking raw milk is generally discouraged for many reasons other than presence of Johne's disease in a herd.

