



# What Causes Johne's Disease?

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*Mycobacterium avium* subspecies *paratuberculosis* (abbreviated MAP) causes Johne's disease. MAP only reproduces inside of the cells of host animals. Many different strains of MAP exist, but all strains of MAP infect animals in a similar way.

## MAP Is a Tough Bug

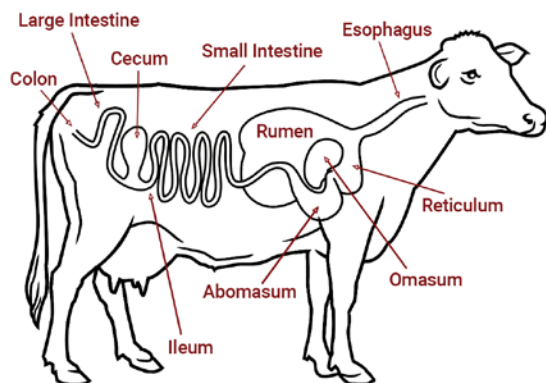
It is very difficult to eliminate MAP from a herd because it persists for a long time in the environment.

Survival of MAP in fields, pastures, and water can exceed one year. MAP bacteria have also proven to be resistant to the low pH of fermented feed.<sup>5</sup>

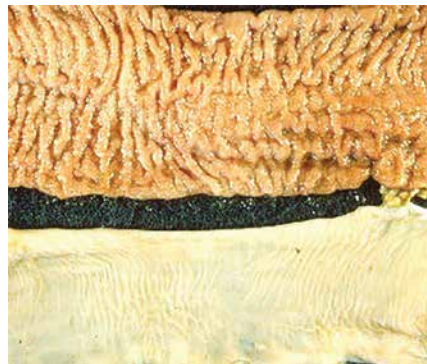
While the bacteria cannot multiply in the environment, an animal consuming water, pasture, or feed that has been contaminated with MAP could potentially become infected.

MAP is resistant to many antibiotics and disinfectants and can survive in hot and cold conditions.<sup>2</sup> Disinfectants labeled tuberculocidal are effective, if organic materials are removed first.

## MAP Infection of the Ileum



In later stages of infection, the response to MAP causes thickening of the intestinal wall, which leads to poor absorption of nutrients. MAP may be found in many tissues and organs,<sup>10</sup> including reproductive organs.<sup>2</sup>



A cow ileum with thickened lining (top) is contrasted with a normal cow ileum (bottom). Photo credit: Michael Collins, DVM, UW Johne's Information Center.

MAP primarily infects the ileum, or the end portion of the small intestine, by invading macrophages in areas of lymphoid tissue called Peyer's patches.

From there MAP migrates to and infects regional lymph nodes, primarily the mesenteric lymph nodes located near the small intestine.

## Johne's Disease Facts

- MAP can evade immune system defenses.
- MAP can survive in the environment, but only multiplies within a host.
- MAP can survive a long time in the environment, at least 8 months in manure and over a year in water.
- MAP is resistant to many common disinfectants.
- The manure pit is usually sampled for herd screening.
- Environmental sampling or composite manure samples can assist in determining a herd's infection status.



Photo credit: USDA NRCS



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