Are young stock contributing to Johne's disease in your herd?

UNIVERSITY OF CALGARY

The latest science on the role young stock play in transmitting Johne's disease may improve its control.

Herman Barkema and Larissa Martins, University of Calgary

Why focus on MAP transmission in calves?

Mycobacterium avium subsp *paratuberculosis* (MAP) causes Johne's disease, which is responsible for substantial economic losses in the dairy industry. Many Johne's disease control programs have been implemented around the world, typically recommending a combination of testing and culling positive animals in addition to implementing management practices to reduce the spread of contaminated manure to healthy animals. However, few programs have been successful in eradicating the disease. One reason for the limited success could be that the programs did not include young stock in their testing strategies. Traditionally thought to not play a major role in transmission, newer research has demonstrated that young stock can play an important role in the transmission of MAP.

The impact of early exposure

Cattle are highly susceptible to getting infected with MAP until at least 1 year of age. In fact, early exposure to MAP in a calf's life at 2 weeks to 3 months of age has been shown to result in:

- **Shedding more MAP in feces**
- **Having higher MAP titers in the blood**
- **Having more severe lesions in the gut**

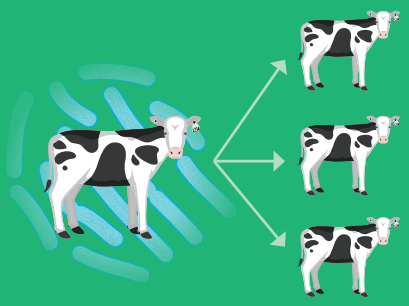
Key Points

- **Johne's disease control strategies often have not included young stock.** Recent research studies have demonstrated that they represent an important source of (MAP) transmission.
- **Testing for MAP has traditionally been difficult;** however, new testing strategies have been shown to accurately identify MAP infected young stock.
- **Using a multi-pronged approach to controlling Johne's disease is critical,** with a focus on identifying infected young stock and implementing key management practices to prevent MAP transmission to young stock.

This early exposure could lead to increased transmission to other herd mates, with infected young stock shedding MAP as early as 4 months following infection. When calves shed MAP in their feces, it will lead to an infection of other animals in contact with their feces. What is the risk?

> **Well, for every MAP infected calf housed in group pens, it will infect on average 1 to 3 non-infected pen mates.**

This highlights the importance of transmission of MAP among young stock.



Diagnosing MAP-infected young stock

Although shedding of high-levels of MAP can occur, young stock tend to shed low doses of MAP intermittently, making it difficult to find young stock in early stages of MAP infection. However, several improvements have been made in the traditional tests used to identify MAP in young stock to enable earlier detection.

Some options for diagnosis and follow-up in testing young stock between 7 to 14 months of age include:

Type of test	Meaning of positive result	Action following test	Final action
Fecal culture and polymerase chain reaction (PCR) confirmation	Infected with MAP	Isolate calf, repeat test in 1 month	Cull if 2nd test also positive
Direct fecal DNA extraction and PCR confirmation	Infected with MAP	Isolate calf, repeat test in 1 month to distinguish passive shedding	
Serum enzyme-linked immunosorbent assay (ELISA)	Infected with MAP but may have cleared the infection	Perform fecal culture or direct fecal DNA extraction and PCR	
Interferon-gamma release assay	Infected with MAP but may have cleared the infection subsequently	Perform fecal culture or direct fecal PCR	

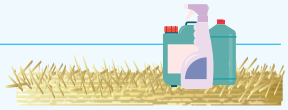
Controlling Johne's disease by including calves

Simply culling MAP-positive animals is insufficient to control MAP transmission within a herd. Therefore, strategies are needed to limit the development of new MAP infections in combination with a test and culling strategy, involving young stock and adult cows. When trying to control Johne's disease, it is important to consider the following areas:

IN UTERO TRANSMISSION

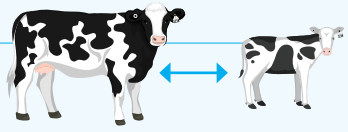
There are reports that 4 to 15% of calves are infected in the uterus from a MAP-infected dam.

MINIMIZE MAP EXPOSURE IN CALF HOUSING



Young stock should be born in a designated clean area for calving that is dry and free of manure to reduce exposure to MAP (and other pathogens) during calving. Furthermore, after calving, it remains important to prevent exposure of calves to feces or feces contaminated feed or equipment containing a high load of MAP.

REDUCE CONTACT BETWEEN NEWBORN AND DAM



Calves can be infected through contact with their dams' feces or by suckling their milk. Reducing calf contact with the dam and the calving environment may be accomplished by placing the calf in a feed tub or early removal after birth. While there is increasing discussion on cow-calf contact from an animal welfare perspective, a recent study showed that early separation of calves and their dams soon after birth reduced the odds of animals becoming MAP-infected by 55%.

MAP-FREE COLOSTRUM, MILK AND WATER

Studies have shown that feeding young stock milk replacer and pasteurized milk reduced the level of MAP when compared to feeding raw milk. In addition, having clean water, devoid of manure, should be provided for young stock. With regard to colostrum, discarding colostrum from MAP-positive cows has been shown to decrease the odds of animals becoming MAP-infected.

TESTING

Testing can be used to determine how successful the management strategies implemented have been but also to identify animals that could be culled.

Work with your herd veterinarian to discuss how you can make changes to your current practices to help prevent and/or control Johne's disease in your herd.

Funding Partners

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