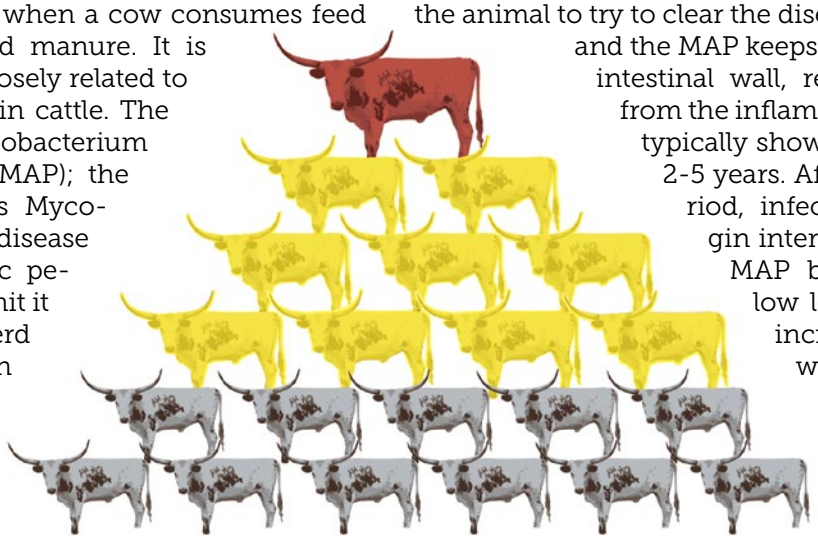
Johne's Disease: What Longhorn Breeders Need To Know

Johne's (YO-neez, not Johnnies) disease is a contagious, fatal disease in cattle transmitted by the fecal/oral route — basically when a cow consumes feed contaminated by infected manure. It is caused by an organism closely related to the tuberculosis bacteria in cattle. The Johne's bacterium is Mycobacterium avium paratuberculosis (MAP); the tuberculosis bacterium is Mycobacteria bovis (MB). This disease has a long asymptomatic period and a cow can transmit it to other animals in the herd unless the breeder has an ongoing screening program. Most Longhorn breeders screen for and promote a Johne's-free herd as an added value. Ignoring Johne's disease can have significant negative financial ramifications. The following is the first of two articles which will give you the information you need to know about this difficult problem.



With one infected cow showing signs Stage III infection you can expect 6-8 to be Stage II and 10-15 to be Stage I
Source: Johne's Disease Newsletter, Winter 2011.

PREVALENCE

The prevalence of Johne's disease is unknown in Longhorn herds but it is primarily a disease of confinement (68% of dairy herds are infected compared to 10% beef herds) — the higher the animal density, the higher the incidence. It has been estimated that 3-5% of all new cow purchases have subclinical Johne's disease. That means the buyer has a 95-97% chance of introducing it into his herd if he buys 100 cows. Dairy cows are the most highly confined breed with the highest incidence of Johne's so the prevalence of the disease in Longhorns is probably much less. Over a long period of time, the incidence is zero only if the breeder never tests his herd for it. Not addressing the problem early only magnifies the economic consequences later.

TRANSMISSION AND CLINICAL COURSE OF DISEASE

Johne's disease typically enters a herd when an infected but healthy appearing animal is purchased. The infected cow then sheds the MAP bacteria in manure and these bacteria can live up to a year on the ground. If the cow is pregnant, the MAP bacteria may also be passed through colostrum, milk and even blood to an unborn calf. Calves are more susceptible than cows probably because of an immature immune system. Once ingested ,the MAP invades the calves' small intestine and at some point initiates an immune response by the animal to try to clear the disease. This typically fails and the MAP keeps multiplying within the intestinal wall, resulting in thickening from the inflammation. Infected calves typically show no sign of disease for 2-5 years. After this incubation period, infected animals may begin intermittently shedding the MAP bacteria in manure at low levels initially, but ever increasing with age. Cows with clinical signs of Johne's disease shed billions of bacteria through their manure and this serves as a source of infection to others in the herd. Because Johne's disease has a long asymptomatic period, breeders may not realize many others have been infected until years have passed. The disease is obvious in the final symptomatic phase with chronic diarrhea and weight loss. Ironically, the cow may have been culled earlier for reproductive failure or raising calves with a failure to thrive. It is truly a sleeping giant unless the breeder develops an ongoing monitoring system.

STAGES OF THE DISEASE

STAGE I Non-detectable infection. This stage occurs in calves, heifers, and young stock under 2 years of age or animals exposed at an older age. Current tests (including fecal culture and serological tests) cannot detect infection.

STAGE II Subclinical shedders. Animals appear healthy but are shedding MAP in their manure at detectable levels. Current blood tests detect less than 50% of Stage II animals. These animals pose a significant threat of infection to other animals. Stage II animals may or may not progress over time to Stage III.

STAGE III Clinical Johne's. The infection is more advanced with stress precipitating diarrhea and weight loss despite a normal appetite. These animals are shedding billions of MAP and fecal/blood detection tests give positive results.

STAGE IV Terminal Animals become extremely thin and may develop bottle jaw. Culled animals for

slaughter may not pass inspection for human consumption. In the typical herd, for every Stage IV animal, many other cattle are infected—representing the "tip of the iceberg"

Weight loss in spite of a healthy appetite is a sign of possible Stage III Johne's.

ECONOMIC CONSEQUENCES

The economic consequences of having Johne's disease in a registered Longhorn herd are several fold. First, the chronic infection of the gastrointestinal tract creates poor nutrient absorption resulting in increased feed costs. Second, energy used to fight the infection reduces overall immunity increasing the risk of secondary diseases — BVD (bovine viral diarrhea), BRDC (bovine respiratory disease complex), P13 (parainfluenza) and others. Third, the energy drained cow is constantly fighting the MAP infection and consequently has a lower body condition score, less milk production and has fewer ovulations. Subclinical Johne's may be why some cows remain thin while the rest of your herd thrives. Fourth, chronic disease will invariably reduce horn growth— that always costs Longhorn breeders. Finally, the ultimate financial insult is bringing a high priced animal home from a sale with subclinical disease and she does not produce well and potentially infects your herd. If you unknowingly sell that infected cow to another breeder, then your reputation suffers and future sales are jeopardized.

LABORATORY DIAGNOSIS

Many infected animals are negative to all existing tests early in the course of the disease. After the animal begins mounting a specific immune response to the bacteria or shedding bacteria in feces, a diagnosis via laboratory testing is possible. However, testing for Johne's disease is frustrating, expensive and imperfect at best. The tests can identify the bacteria in feces or blood, but there are many false positives and negatives. The next article is devoted entirely to laboratory diagnosis as it is complicated and misunderstood for herd management.

CONCLUSION

Every breeder large and small should have a management plan for prevention and detection of Johne's.

If you have a Johne's free herd (to your knowledge- or relatively proven by screening tests):

(1) Avoid introduction of an untested asymptomatic animal. Since we all start our Longhorn herds by introducing outside animals to our herd from public auction or private treaty purchase, it is best to buy from breeders that have an ongoing screening program with blood and fecal tests.

2) Purchase cows that test negative 30 days before the sale.

(3) Test all animals over 24 months old every 6-12 months.

(4) If you really want an animal that has not been tested, quarantine and test that animal prior to releasing it into your herd.

If Johne's has been detected in your herd:

(1) The fastest elimination will come from testing all animals over 24 months old and culling all positive animals and offspring . The key is to understand all the intricacies of the laboratory tests before making a decision.

(2) Consider all manure infective and reduce build-up in pens and pastures

(3) Feed in bunks when possible and frequently move the location

(4) If you feed on the ground , change the location daily

(5) Clean the cattle working environment frequently.

(6) Reduce cow density and rotationally graze to minimize contact with manure. Do not graze on known contaminated pastures.

If you have a Johne's positive high priced cow that you want to keep the genetics in your herd:

(1) Quarantine her from the negative herd

(2) Remove her newborn calf from the positive dam immediately and hand raise at a MAP-free location

(3) Do not use milk or colostrum of unknown MAP status to feed the calf

(4) Regularly check the calf for Johne's to insure no transmission occurred in utero.

(5) Talk to your reproductive veterinarian about the possibility of getting uncontaminated aspirated oocytes to keep the genetics in your herd and then unfortunately taking her to the sale barn if the diagnosis is definitively established.

Next month we will focus on the interpretation of laboratory tests for Johne's and the added value of having a Johne's free herd.

1. Johne's Disease: Don't Bring Home more than you bargained for Oregon State Small farms. Vol 6(4) 2011
2. Johne's Information center. University of Wisconsin- School of Veterinary Medicine. 3/2010
3. Johne's disease in Canada: Part I Clinical Symptoms ,pathophysiology ,diagnosis and prevalence in dairy herds Can Vet J. 2006 Sep; 47(9): 874–882.
4. Johne's Information Center. http://www.johnes.org/general/faqs.html
5. Michael T. Collins, School of Veterinary Medicine, University of Wisconsin-Madison. http://www.merckvetmanual.com/generalized-conditions/paratuberculosis/overview-of-paratuberculosis
6. Johne's Disease in Beef and Dairy Herds (V1209 (Revised)). North Dakota State University
7. Johne's Disease and the ethical dilemma. Steven Hendrick PhD March 19, 2013 by Beef Research