

Johne's Disease Information for the Veterinarian, Article No. Three

This is the third article in a series presenting the most current information and methods about Johne's disease in cattle. The series is directed toward veterinarians helping clients prevent or control this disease. Each article has been three-hole punched for your convenience. They can be collected and saved in any three-ring binder notebook for future reference. This series is being presented by the AABP Food Safety Committee. Information was edited and reviewed by the National Johne's Working Group, and endorsed for distribution by the USAHA.

Critical Management Points for Prevention and Control of Johne's Disease in Beef Cattle

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Premise for critical management points

1. Management points directed at prevention or control of Johne's disease will also reduce the risk for other important cattle pathogens such as rota and corona viruses, *E. coli*, *Salmonella sp.*, coccidia and *Cryptosporidia*. They will also help to improve animal performance.
2. Johne's disease is caused by the acid-fast, intracellular bacteria, *Mycobacterium avium subspecies paratuberculosis*, which infects intestinal track. During the final stage of infection the pathogen is disseminated to other organs as well. The infection causes diarrhea, poor performance, wasting and death. Clinical signs of the disease occur more commonly during the end stages of the infection.
3. Calves are at highest risk for infection and most susceptible.
4. Not all cows advance to clinical disease. What proportion and why is unknown.
5. The infection is chronic and mostly subclinical in nature. Thus, Johne's should be regarded as a herd-wide problem, not just a matter for individual cows that exhibit end-stage clinical signs.
6. An infected cow may shed the pathogen in her feces for months to years before she develops clinical signs. The cow may shed 10^6 to 10^8 mycobacteria/gram of her manure, thus severely contaminating her immediate environment. In the final stage, there may be 30 to 30,000 mycobacteria per ounce in her colostrum and milk. The bacteria can disseminate to infect a fetus *in utero*.
7. Johne's disease can be prevented, controlled and even eliminated from infected herds by applying critical management points that are based on an understanding of the epidemiology and pathogenesis of the disease.
8. Prevention or control of Johne's takes commitment and time. Half-hearted attempts to prevent or control the disease will generally fail. Prevention is in all ways, cheaper than control. After the infection enters a herd it may be years before clinical signs are noticed and is likely to take five or more years to control.

Prevention

The NAHMS Beef '97 survey showed that 80% to 90% of U.S. beef herds were at low risk for,

or may not have Johne's disease. Therefore, prevention should be the goal of every beef cattle operator. There is a need for low-risk and infection-free replacement animals. Veterinarians should encourage their cow/calf producer clients to find out their herd's Johne's infection status. If they are Johne's-free, assist them with plans to prevent entrance of infection.

The basics of preventing the introduction of Johne's disease are straight forward: close the herd to infected replacements, recipients, bulls or herd additions; and guard against entry of manure contaminated equipment, feed, water and contaminated colostrum or milk from other herds.

Recall that current tests are adequate tools that function well at the herd level for determining the infection status of the client's herd, or that of potential replacement animals from tested herds. However, they have low accuracy in detecting the early stages of infection, even in mature animals. Negative test results from immature animals (<24 months of age) for Johne's generally have limited value.

The Johne's disease-status of a source-herd provides critical information for estimating the infection status of an individual. Confidence that an animal, or herd, is not infected requires repeated tests with negative results, taken over time. However, national, USAHA approved, guidelines exist to establish a low risk herd status using cost effective testing.

I. Critical Management Points for Prevention of Johne's Disease

A. Prevent infections by closing the herd to animals with an unknown Johne's infection status.

1. *Purchase from a tested-negative herd.*
 - The owner has individual cow/calf records.
 - The owner uses the critical management points against Johne's disease.
2. *Pretest mature cow and bull additions.*
 - Recommended only when animals are acquired from an outside source of unknown infection status.
 - Test them two or three times at six to twelve month intervals, depending on the level of assurance desired.

B. Secure replacements, recipients and additions from herds that are at low risk for Johne's disease.

1. *Obtain from a herd with negative Johne's history.*
 - Owner and veterinarian can document Johne's disease monitoring and the herd has had no Johne's cases for past five years.
2. *Acquire from a herd with low Johne's incidence.*
 - Animals have tested positive for Johne's disease but herd history and test results indicate a low incidence.
3. *Purchase from a herd that tested negative on a sub-sample of the herd.*
 - Confidence in actual Johne's disease prevalence will depend on sub-sample size. See the testing protocol for the National Johne's Herd Status Program for examples of statistical subset sample sizes and their respective confidence limits.

4. *Pre- and post-test adult animal additions.*
 - Keep them isolated until cleared by tests.
 - Test them two to three times at six to twelve month intervals for increased confidence in their negative status.

Control

Additional steps are required to control infection. The critical management points in beef herds are aimed at protecting young stock from infection and reducing the pathogen load in the environment to reduce risk for transmission to young cattle. Identification and removal of infected animals may be more important in the beef herd because separation of young calves from adults is not practical.

Capitalize on the decision to manage against Johne's disease by addressing other health and performance issues on the ranch or farm that involve the same management areas and can be targeted as additional client goals.

Examples include reducing risk for other pathogens, improved calving management, improved heifer development, reducing feed waste and improving pastures.

II. Critical Management Points for Control of Johne's Disease

A. Reduce infections by manure management (all manure is suspect).

1. *Reduce exposure to *M. paratuberculosis* for newborns.*
 - Avoid a manure build up in pastures and corrals where late gestation cows are kept.
 - Clean calving area, keep cow density low, avoid overcrowding.
 - Move new cow/calf pairs to clean pasture as soon as bonding occurs.
 - Avoid keeping high risk or sick cows in common calving area.
2. *Provide clean feed for young stock and mature animals.*
 - Avoid manure contamination of feed by using feed bunks and/or hay racks.
 - Do not allow young stock and infected adults to use the same feed, pasture, or water sources.
 - Consider forage crops that had fresh manure applied as fertilizer during the current growing season as a feed risk to young stock.
 - Use separate equipment to handle manure and feed.
3. *Provide clean water for young stock and mature animals.*
 - Supply clean water, not contaminated by potentially infected animals.
 - Use troughs or panels to restrict access to streams and ponds.
 - Divert manure runoff from water sources.
4. *Keep manure from mature animals separate from young stock.*
 - Raise weaned young stock in separate facilities, or pastures not recently used by adult cattle.
 - Prevent transporting bacteria to young stock by people, runoff and equipment.
 - Transport cattle in clean trucks.

B. Reduce infections by colostrum management.

1. *Feed "low risk" colostrum.*

- When certain calves need a colostrum supplement, collect from healthy cows, negative on recent tests.
- Thoroughly clean the udder and teats before collection to avoid fecal contamination.
- Consider using quality commercial colostrum supplement products.

C. Reduce infections by management of infected animals (critical for beef herds).

1. *Identify and remove clinical and late-stage animals immediately.*
 - Watch for and confirm diagnosis of Johne's-suspect animals early.
 - Cull test-positives immediately, or segregate them from calving area and young stock.
 - Consider culling or segregating all offspring of these infected dams.
2. *Test to manage subclinical animals and define herd status.*
 - Develop and carry out appropriate test strategy to identify subclinically infected animals.
 - Cull, segregate, or manage them to reduce pathogen exposure to others.
 - Have a plan for high and low risk animals, based on test results, that enhances control efforts.
 - Strongly consider keeping replacement animals only from test-negative cows.
 - Schedule herd-testing to provide optimal information for herd management, i.e., testing at herd pregnancy examination or herd vaccination time.
3. *Be aware of disease risks when adding animals.*
 - Know the risk in the source-herd for infections one may bring in, i.e., Johne's, Salmonella, BVD or Cryptosporidia, etc.
 - Consider pretesting, including the source herd, where appropriate.
 - Isolate, observe and test new arrivals before adding to herd, then integrate them into the routine test program

D. Work with clients and key employees to develop a plan

- Use "Johne's Disease Manual for Veterinarians," Bovine Practitioner, June 1999.
- Take the time to work with your clients to develop a prevention or control plan that fits their operation.
- Assess herd history and estimate the level and potential impact of Johne's disease.
- Do a risk assessment of areas where infection can spread on the farm or ranch.
- Help clients define specific control measures to meet their objectives and situation.
- Make a team involving employees and other advisors, from the start, who will be responsible for carrying out the plan long term.
- Review plans and records regularly. Identify and address problems as they arise.