***Johne's disease, Article No. Two***

# Critical Management Points for Prevention and Control of Johne's Disease in Dairy 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 and improve animal performance.

2. Johne's disease is an intracellular intestinal infection caused by the acid-fast bacterium, *Mycobacterium avium subspecies paratuberculosis.* The infection eventually causes weight loss (despite good appetite), drop in milk production, diarrhea (sudden onset or intermittent) and death. Some cows may develop "bottle jaw" due to a low protein edema, or appear unthrifty overall. Clinical signs of the disease occur more commonly during the end stages of the infection, typically at three to six years of age.

3. Not all cows advance to clinical disease. What proportion and why is not always known. It may be because the infection progresses slowly, infection is arrested, or the cow leaves the herd for other reasons.

4. The infection is chronic and mostly subclinical in nature. Only 1-5% of infected cows in a herd may show signs of the disease each year while the rest appear healthy. Thus, Johne's should be regarded as a herd problem. A cow with clinical Johne's disease represents the "tip of the iceberg" of infected animals in the herd.

5. An infected cow may shed the pathogen in her feces for months to years before clinical disease develops. The clinical cow may be shedding $10^6$ to $10^8$ mycobacteria per gram of feces, thus severely contaminating her immediate environment. Two feedings of $10^6$ organisms can infect a calf. In the late stage of disease, the microbe can disseminate into colostrum, milk (10 to $10^3$ organisms/ml) and the fetus.

6. 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.

7. Prevention or control of Johne's takes commitment and time. Half-hearted attempts to prevent or control the disease will generally fail. Once the pathogen is brought into a herd the infection can spread through the herd for a few years before clinical cases are noticed. A typical herd control program may take five years or longer. A shorter period is possible, but may be more expensive. Prevention is in all ways cheaper than control.

8. Many other pathogens that affect dairy cattle are also transmitted via the fecal-oral route. A partial list includes: Corona and Rota viruses, E.coli, Salmonella, Coccidia, Cryptosporidia and intestinal nematodes.

## Prevention

The NAHMS Dairy '96 survey showed that 60% to 80% of U.S. dairy herds were at low risk for Johne's disease. Therefore, prevention should be the goal of every farm that is currently free of the disease.

The basics of prevention are straight forward: Prevent introduction of the microbe by closing the herd to infected animals and guard against entry of equipment, feed and water that is contaminated with manure.

The Johne's disease-status of a source-herd provides the most information for estimating the infection status of an individual.

Current diagnostic tests for Johne's are adequate tools for use in disease prevention at the herd level. 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 may be of limited value

Confidence that an animal, or herd, is not infected requires repeated tests with negative results, taken over time.

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. *Acquire from a test-negative herd owner.*
   - Owner has individual cow/calf data.
   - Practices critical management points
2. *Pretest mature cow additions.*
   - Only when acquired from outside sources of unknown Johne's infection status.
   - Test them two to three times at six to twelve month intervals.

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

1. *Acquire from a herd with negative Johne's history.*
   - Owner and veterinarian document monitoring and the herd has had no Johne's cases for past five years.
2. *Acquire from a herd with low Johne's prevalence*.
   - Tested positive for Johne's disease but history and test results indicate low prevalence.
3. *Acquire from a herd that tests negative on a sub-sample of the herd*.
   - Negative test results from 30 randomly chosen cows, > three years old, likely indicate that < 10% of the cows are infected.
   - *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.

## Control

Additional steps are required for control of infection. The critical management points are aimed at

protecting young stock from infection and reducing the pathogen load in the environment to reduce risk for transmission.

Control is based on improving management and offers the opportunity to capitalize on the decision to manage against Johne's disease. Many health and performance issues involve the same management areas and can be targeted as additional client goals. Examples include reducing risk for other pathogens, improved maternity management, monitoring of fresh cows, improved heifer development, improved bunk management, etc.

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

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

1. *Reduce exposure of newborns to M. paratuberculosis in the maternity area.*
   - Clean dry maternity area.
   - Remove newborn calves from dams, do not allow calves to seek or nurse.
   - Avoid keeping high-risk cows in common calving area.
   - Separate maternity and hospital areas.
2. *Provide clean feed for young stock and mature animals.*
   - Do not feed rations contaminated by manure from potentially infected adults including refused cow feed.
   - Use separate equipment to handle manure and feed.
   - Reduce contamination from human and equipment traffic patterns.
   - Do not allow young stock and infected adults to use the same feed, pasture, or water.
   - Do not feed hay or forage with residual manure, i.e., applied during the same season.
3. *Provide clean water for young stock and mature animals.*
   - Supply clean water, not contaminated by potentially infected animals.
   - Use troughs or individual waterers.
   - Restrict runoff, or access to standing water that collects runoff.
4. *Keep manure from mature animals separate from young stock.*
   - Raise young stock in separate facilities,
   - Or use solid barriers to prevent contact with adult manure.
   - Prevent transporting bacteria to young stock by people, equipment, etc.
   - Prevent manure runoff from mature animals from reaching young stock.

**B. Reduce infections by colostrum and milk management.**

1. *Feed "low risk" colostrum.*
   - From healthy cows, negative on recent tests, i.e., no suspicion of Johne's.
   - One cow to one calf, not pooled.
   - Set up a colostrum bank from test-negative cows, refrigerate and/or freeze.
   - Consider colostrum supplement use.
2. *Feed "low risk" milk.*
   - Milk replacer best.
   - Pasteurize milk or collect only from healthy cows with recent negative tests.
   - Thoroughly clean the udder and teats before collection to avoid fecal contamination.

**C. Reduce infections by management of infected animals.**

1. *Identify and "remove" clinical and late stage animals as soon as possible*.
   - Watch for and confirm diagnosis of Johne's-suspect animals early.
   - Cull test-positives immediately, or segregate them from maternity areas and young stock.

- Do not feed their colostrum or milk.
- Consider culling or segregating all offspring of infected dams.

2. *Test to manage subclinical animals and define herd status.*
   - Carry out test strategy to identify subclinically infected animals.
   - Cull, segregate, or manage them to reduce pathogen exposure to others.
   - Manage high and low risk animals, based on test results, to enhance control efforts.
   - Schedule testing to have timely information for management, i.e., monthly testing of late-lactation cows to make decisions about their .
3. *Be aware of disease risks when adding animals*
   - Know the risk for infections that may be acquired from the source-herd, i.e., Johne's, Salmonella, Strep ag, Staph aureus, BVD, Mycoplasma or infectious foot diseases.
   - Consider pre-testing, including the source herd, where appropriate.
   - Isolate, observe and test new arrivals before adding to herd, or integrate into a routine test program

4. 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.
   - Assess herd history and estimate the level and potential impact of Johne's disease.
   - Do a risk assessment of points where infection can spread on the farm.
   - Help clients define specific control measures to meet their objectives and situation.
   - Involve employees and other advisors, as a team responsible for carrying out the plan over the long term.

Note:
Some additional recommendations are:

1 Get current on Johne’s disease epidemiology, control points and diagnostic test performance and interpretation.
2. Ask if the diagnostic laboratory is approved by the NVSL for the Johne’s disease diagnostic tests they offer and what test interpretation they provide.