NATIONAL JOHNE'S EDUCATION INITIATIVE

Johne's Disease – Beef

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Johne's Disease — *What You Need to Know, Part I*

While research shows that only eight out of 100 U.S. beef herds may be infected with *Mycobacterium avium* subspecies *paratuberculosis* (*MAP*), the organism that causes Johne's disease, Dr. Elizabeth Parker with the National Cattlemen's Beef Association stated at an October 2009 Johne's Disease Working Group meeting that "If you ignore any disease—including Johne's disease, it will become a threat."

A prevalence study conducted in the Georgia beef industry found that 4% of Georgia beef cattle test positive for Johne's disease —and this 4% infection rate is estimated to cost to the Georgia beef industry $2.45 million to $4.9 million each year. If 8% of U.S. beef herds are infected with Johne's disease—as research indicates and the cost of the disease reflects the Georgia figures, then the cost of Johne's disease within the beef industry could reach $100 million and up.

"That's good reason for beef producers to be aware of Johne's disease and take proactive steps to keep the disease from entering their herd," states Dr. Elisabeth Patton, chair of the National Johne's Disease Committee of the U.S. Animal Health Association. "At a minimum, beef producers should participate in the Voluntary Bovine Johne's Disease Control Program on at least the education and management levels.

"Johne's disease is an easy disease to buy as animals that show no clinical signs of Johne's disease can still be infected with *MAP*. Producers should always ask questions about a beef herd's Johne's disease status and only purchase from low-risk herds. I need to underscore the fact that no herd—beef or dairy—can say it is 'Johne's free.' Herds that have been tested and have no positive animals can only say that they are low-risk herds."

There are three stages of Johne's disease in cattle:

STAGE I: Cattle are infected but showing no clinical signs and not shedding *MAP*.

Typically this stage occurs in calves, heifers, and young stock less than two years of age and many adult animals exposed to small doses of the disease-causing organism. This stage progresses slowly over many months or years to Stage II.

MAP, the bacteria that causes Johne's disease, doesn't take a break even in winter. Educate yourself about Johne's disease. Email info@johnesdisease.org today and request your free copy of "Johne's Disease Q&A for Bovine Producers."

STAGE II: Cattle are infected, shedding *MAP* but do not show clinical signs of the disease.

Typically this stage occurs in older heifers or adults. These animals pose a major, but often hidden, threat for infection of other animals through contamination of the environment.

STAGE III: Cattle are shedding *MAP* and showing clinical signs.

The onset of Stage III is often associated with a period of stress, such as recent calving. Cattle at this stage have intermittent, watery manure. Animals lose weight and gradually drop in milk production but continue to have a good appetite. Some animals appear to recover but often relapse in the next stress period. Most of these animals are shedding billions of *MAP* organisms that can infect herdmates and calves.

(Continued on Page 2)

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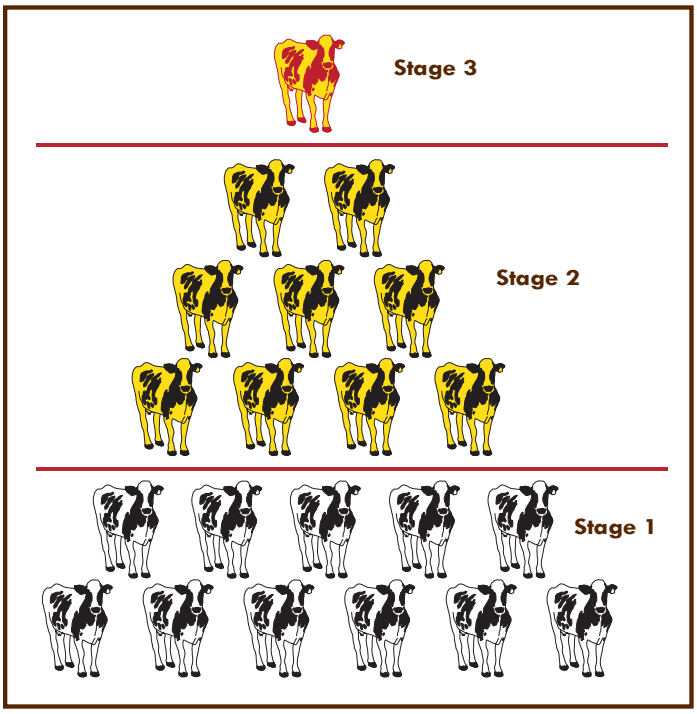
In the final and terminal aspects of Stage III of the fatal disease, animals become emaciated with fluid diarrhea and develop "bottle jaw." The carcass may not pass meat inspection for human consumption in the later phases of Stage III.

'The Iceberg Phenomenon' – Infection in the Herd



In the typical herd, for every animal showing clinical signs (Stage III), many other cattle are present in the earlier stages of the disease. The clinical case represents only the "tip of the iceberg" of *MAP* infection.

For every Stage III cow you can expect:

1-2 more cows in Stage III (clinically diseased)

6-8 cows in Stage II (unapparent shedders)

10-15 cows in Stage I (infected but not shedding *MAP*)

The iceberg phenomenon illustrates the key concept in recognizing the potential impact that Johne's disease can have on a herd. That is, if the infection remains unchecked, the rate and number of infected animals in the herd increases progressively over time. Early diagnosis and prevention of spread, before clinical cases have surfaced, can avoid the development of Johne's disease into a significant herd problem five to ten years into the future.

Vaccine Project in Phase 2

With a strong interest among many producers and veterinarians to have a more effective vaccine to help protect against Johne's disease, USDA/APHIS/VS is funding a vaccine project overseen by the Johne's Disease Integrated Program. The first phase of the project was an in vitro screening of all submitted candidates in laboratories at the University of Wisconsin-Madison and the University of Minnesota. Phase 2, which has begun, is to evaluate the Top 10 candidates using a mouse model.

The top candidates identified in Phase 2 will then be evaluated using a goat model.

"The goat model provides results very similar to those expected from cattle, but they are obtained more rapidly and at a lower cost," states Dr. Ken Olson, JDIP Outreach Coordinator.

"It is anticipated that, at the end of this process, one or more vaccine candidates will be identified for potential commercial development."

Dr. Olson adds that the project, from start to finish, is expected to take approximately three years.

Editor's Note: Commonly referred to as JDIP, the Johne's Disease Integrated Program is a comprehensive consortium of scientists whose mission is to promote animal biosecurity through the development and support of projects designed specifically to enhance knowledge, promote education, develop real-world solutions and mitigate losses associated with Johne's Disease. The coming together of scientists promotes efficiencies through collaborative research and sharing the intellectual and physical resources that are critical to overall success.

For information about Johne's disease, contact your Designated Johne's Coordinator Randy L. Wheeler, *Randy.Wheeler@IowaAgriculture.gov*, Ph (515) 281-0866 or your Beef Quality Assurance Coordinator Brian Waddingham, *brian@iabeef.org*, Ph (515) 296-2305.

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