Summer 1990

Johne's Disease Update

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Recommended Citation
Perloff, Susan (1990) "Johne's Disease Update," Bellwether Magazine: Vol. 1 : No. 29 , Article 2. Available at: https://repository.upenn.edu/bellwether/vol1/iss29/2

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Managing dairy cattle is a cinch. Just give the herd acres of vegetation and a clean place to sleep, and use creme-de-la-creme milking equipment, and no problem.

There is a problem, though, by the name of Johne's (pronounced Yo-neeze) disease, caused by *Mycobacterium paratuberculosis*, a wasting illness that infects numerous cattle herds in Pennsylvania and throughout the USA and the world.

The good news is that promising strides are being taken by Dr. Robert H. Whitlock, Marilyn M. Simpson Professor of Equine Medicine, and Dr. Raymond W. Sweeney, Assistant Professor of Medicine, at New Bolton Center. They have utilized a powerful culture test that is three times more sensitive than that being used by most state agricultural specialists. Even with the more sensitive test, only 25-35% of all infected cattle in a herd will be detected on the first herd fecal culture test. This test is currently considered the "gold standard" test and is clearly superior to all currently available blood or serum tests. The bad news is that fecal culture testing requires a 12- to 16-week incubation period.

Dr. Whitlock considers this incubation time a "major frustration," but, he says, "As we develop a more sensitive culture test, we should be able to detect infected cows earlier than with other tests. When we report the results of our test, we give farmers the culture results as a score indicating how severely infected the cattle are. Cows with the highest score present the greatest risk to other cattle.
The economic losses may come from decreased milk from the adult herd and provide them with the disease and agribusiness representatives. Dr. Whitlock explained that, by repeated culture and culling infected cows, farmers can work toward obtaining a Johne’s-free herd. He describes the many unusual features of the disease:

- long incubation: two to eight years from infection to onset of clinical signs
- lack of a good diagnostic test to detect early infections
- tendency for infected animals to shed mycobacteria years before they show external signs of disease
- lack of treatment for infected animals
- availability of a vaccine of marginal value
- the organism’s ability to persist in the environment for months
- lack of complete understanding of transmission of the disease among cattle
- prolonged culture time: 12 to 16 weeks
- tendency for fecal cultures to be contaminated with bacteria and fungi
- unknown role of deer in the transmission of the disease

Diagnosis. Fecal culture is the most widely accepted diagnostic test, having no false-positive results when conducted properly. The problems are the difficulty of handling specimens, the 12- to 16-week incubation period, the contamination of specimens, and the lack of sensitivity: less than half of infected animals may be detected on a single test. By concentrating the sample, the Penn team has tripled the sensitivity rate compared to the earlier suspension techniques.

Despite the improvements in culture sensitivity, though the major disadvantage remains the prolonged incubation period; in some laboratories, the 12-to 6-week incubation period, the contamination of samples, and the lack of handling specimens, the 12-to 6-week incubation period initiates a faster onset of signs. The dose of organism ingested (a larger dose initiates a faster onset of signs).

This disappointing situation carries its own unhappy consequences. If a “carrier” is sold, the unsuspecting purchaser may be blind to the pernicious disease into a previously healthy, clean herd. Dr. Whitlock, a recognized expert on Johne’s organism, points out that the organism’s ability to persist in the environment for months, and may shed for years before clinical signs appear.

Transmission. Most often, Johne’s disease is transmitted when newborn calves consume milk, colostrum or feed that has been contaminated with manure containing the Johne’s organism. Sometimes calves suckle teats that are contaminated. (Even if the farmer washes the outside of the udder, the bacteria may be lurking inside the udder.) All young calves are susceptible to manure from any infected adult, too.

Although Johne’s can be transmitted to animals six to 24 months old or older, this occurs uncommonly on most farms. Dr. Whitlock, a recognized expert on Johne’s organism, explains that Johne’s is not present on the farm of the owner.

The owner of a Guernsey herd noticed weight loss and chronic diarrhea, development. The time lapse between infection and the appearance of clinical signs depends primarily on two factors:

1. The age at which the calf was first infected (newborns are most susceptible)
2. The dose of organism ingested (a larger dose initiates a faster onset of signs).

It is commonly believed that after the first two years of life, infected animals shed Johne’s organism in their manure, and may shed for years before exhibiting any clinical symptoms.

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