Quebec voluntary Johne's disease prevention and control program

A new option: milk screening

In charge of the program's management and financial support, the Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (MAPAQ) now includes the possibility of screening for the disease using a milk sample.

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Johne's disease is a chronic and incurable intestinal infection that affects cattle and other ruminants. It is caused by a bacterium called *Mycobacterium avium* subspecies paratuberculosis (MAP). The incubation period (time between contamination and the appearance of the first clinical symptoms) is long and the disease progresses slowly, thus making it difficult to detect.

Johne's disease has been a concern to the Quebec dairy industry for many years now, because it leads to significant economic losses in severely contaminated herds. It also constitutes a potential public health risk.

Damaging economic impact

The damaging economic consequences of Johne's disease stem from the gradual decrease in productivity in infected animals, which often leads to premature culling. The presence of the disease in a herd could also ultimately translate into restrictions on the sale of genetic material, since export markets are more and more sensitive to this condition.

Precautionary measures are always relevant

The scientific community continues to study the potential role of MAP in Crohn's disease (an intestinal disease) in humans. To date, there is insufficient evidence to conclude with certainty that MAP is the causative agent of this disease. Nonetheless, the dairy industry is applying the principle of precaution: when in doubt, implement measures to protect the consumer.

Industry concerns led MAPAQ, veterinary practitioners (AMVPQ), and the *Faculté de médecine vétérinaire* to offer Quebec dairy producers, as of 2007, a voluntary program aimed at preventing and controlling the disease. The objectives of this voluntary program are to:

- make dairy producers aware of the importance of Johne's disease
- encourage the implementation of husbandry practices that effectively reduce disease transmission
- identify low-risk herds
- screen out severely infected herds
- target intervention in these herds to help them fight the disease

The key to a successful Johne's disease prevention and control program is to intervene effectively to minimize the risk factors associated with the disease. Identifying management factors that may be contributing to the spread of the condition is an **essential first step.** A meeting between the dairy producer and his or her veterinary practitioner will help to identify any management practices that need to be corrected. Subsequently, the veterinary practitioner will recommend the appropriate screening test, taking into account both the producer's goals and the herd's history.

Experts have shown that, due to the nature of the disease, a control strategy based solely on testing and eliminating positive animals is doomed to failure.

Hence it is absolutely essential that the factors associated with the spread of the disease be effectively controlled. The main source of contamination in heifers (0-9 months) is exposure to manure from cows infected with the bacterium. Bacteria can also be transmitted through colostrum and milk from contaminated cows. The introduction of bacteria-carrying animals into the herd is a common transmission pathway for the disease.

Is Johne's disease present in my herd?

Herd-level screening for Johne's disease can be used to identify low-risk dairy operations and those where the disease is causing appreciable economic losses.

There are two options available to determine a herd's status:

1) bacteriological culture using fecal samples from the environment
2) serological testing on milk samples

When all the sample results (bacteriological culture or serological test) are negative, the herd is classified as low risk. Experts consider the economic impact of the disease to be negligible in a low-risk herd. More importantly, good management conditions (controlling risk factors) will gradually eliminate the condition, should it exist at a low level.

Experts also alert producers to the fact that a negative test result combined with poor husbandry practices is tantamount to playing Russian roulette!

When one or some of the samples (bacteriological culture or serological test) are positive, the herd is considered to be contaminated. Since the incidence of the disease is probably quite high (15 per cent of animals, according to experts), the producer should work with a veterinary practitioner to develop an intervention plan. Herds identified as positive are those that suffer appreciable economic losses, which justify the cost of an intervention plan.

Which screening test should be used to determine the herd's status?

When it comes to screening at the herd level, the two approaches (bacteriological culture and serological test) are considered to be equally reliable. The choice is therefore made on the basis of a thorough analysis of the situation by the producer and the veterinary practitioner.

Bacteriological culture of fecal samples from the environment is often a worthwhile and less costly alternative in herds with a low risk for contamination, based on the farm's history and the risk assessment.

When compared on a unit price basis, bacteriological culture is more expensive than the serological milk test. However, the economic advantage of bacteriological culture of fecal samples from the environment derives from the fact that six samples are sufficient to determine the status of the herd. The serological test using milk samples requires 60 samples to obtain the same level of certainty.

Herds where severe contamination is suspected could benefit from the serological test. If the herd test determines the herd is contaminated, the veterinary practitioner and the producer can request the results of the individual analyses to verify the status of all the animals.

Determining a cow's status

During the first stages of the disease, the bacteria discretely establish themselves in the intestine, without inducing the production of antibodies by the immune system. There is minimal shedding of bacteria in manure, which explains the poor performance of diagnostic tests in the initial stage of the disease. As the infection evolves, the bacteria multiply and the tests become more and more conclusive. A negative result must always be considered in this context (false negatives are not rare).

The nature of the disease and the accuracy of the testing procedures are such that a positive result is usually considered reliable for an animal showing clinical signs of infection. Conversely, the veterinary practitioner will have to consider a number of factors when interpreting a positive result for an asymptomatic animal.

An individual screening strategy (milk), in conjunction with selective culling and beneficial management practices, is often implemented in highly contaminated herds. In such a case, the individual serological test is often indicated because it is more rapid and less costly. The possibility of using the DHI milk sample for the testing also simplifies the procedure.

How do I purchase without contaminating my herd?

Individual testing doesn't provide the buyer much of a guarantee. In fact, it often procures a false sense of security. Testing identifies very few animals under the age of 24 months carrying the disease. Even in multiparous animals, false negatives are not a rare occurrence.

Producers are advised to purchase animals from herds with a low risk for contamination.

There is no such thing as zero risk when it comes to preventing the introduction of Johne's disease into a herd. Buyers should be wary of an operation that claims to be disease-free. Ideally, you should buy from an operation where management practices are not conducive to the spread of the condition and where the result of the herd screening test was negative. Ideally, you want to buy from a herd owner who does things as well as or better than you do.

The voluntary Johne's disease prevention and control program implemented in Quebec offers buyers a valuable alternative. As of November 17, 2010, 981 dairy herds were enrolled in the program. Of those, 962 have completed the risk assessment and 411 have performed screening procedures. To date, 95 per cent of the herds tested have been classified as low risk for contamination after a negative test result.

Consult your veterinary practitioner to set up a protocol that will ensure the profitability of your investment when you purchase an animal.

Battling with the disease is frustrating; buying it is even more so!