Johne's Disease

Johne's disease (JD) is an infection of the intestinal tract caused by the bacterium *Mycobacterium avium* spp. *paratuberculosis* (MAP).

What's the Impact?

Johne's disease is an infectious disease found on many dairy farms that is particularly challenging to control[1-2].

Similar to BLV infection, infection with MAP will only produce clinical signs of disease (diarrhea, rapid weight loss, low milk production, and death) in 10-15% of infected cows[3]. The greatest impact of disease is seen in those that are subclinically affected (infected animals that do not show signs), which results in[4,5]:

- **Reduced milk production**
- **Increased mastitis risk**
- **Reduced slaughter value**
- **Premature culling**

What Does it Cost You?

The effects of JD result in significant economic losses to the dairy industry, with Canadian researchers estimating a loss of $416 per infected cow, per year[6,7]. **With an estimated 10% of cows infected within a positive herd, JD could cost approximately $4,200[7] per year for the average Canadian dairy farm (assuming 100 milking cows).** *All costs listed in Canadian dollars.*

Where Does it Come From?

Biosecurity is absolutely crucial in order to control between- and within-herd transmission of these pathogens. The primary route of transmission for MAP is through feces, where animals consume the feces of infected animals. Other modes of transmission include ingestion of milk or colostrum from infected cows, and transplacental transmission. Newborn calves (within 24 hours of life) are most susceptible[8] but calves less than 6 months of age also have significant risk.

Biosecurity Between Farms

The most likely source of MAP introduction into a previously uninfected herd is through the purchase and introduction of infected cattle. This occurs when cattle have not been tested, or are assumed to be healthy because they are not showing signs of the disease. The best way to prevent entry is to maintain a closed herd. If you must buy animals in, consider purchasing cattle from herds with a known disease-negative status or test cows prior to introducing them.

Some other sources of transmission include manure movement between farms, provision of contaminated colostrum or milk for calf feeding, and sharing of pastures or water sources between herds. These sources are low-risk when compared to the purchase of infected animals[8].

If you must buy animals in, consider purchasing cattle from herds with a known disease-negative status or test cows prior to introducing them.

Biosecurity Within Farms

As highlighted below there are many risk factors (factors associated with a higher level of JD) and protective factors (factors associated with lower levels of JD) that have been identified. The majority of the risk factors identified relate back to the fecal oral cycle and manure management.

Johne's Disease

HOUSING

- Manure build-up in calving area
- Routine use of calving pen for sick and lame cows

MANAGEMENT

- Smaller herd size
- Calves fed colostrum from known negative dam
- Use of pasteurized colostrum or colostrum replacer
- Purchase of cattle within the past 5 years
- Youngstock exposed to the feces of adult cattle
- Poor dry cow cleanliness
- Length of time calves spend in calving area

PROTECTIVE FACTORS[9,10]

RISK FACTORS[9,10]

Control Strategies

The major challenge with MAP is breaking the continual cycle of disease. This can be accomplished through[11]:

1. **Protecting youngstock from manure of adult cows, as well as feed and water contaminated with manure**
2. **Reduce the number of infected animals in the herd that may be shedding bacteria**

Management

Specific management practices that could be implemented to reduce transmission to youngstock include[11]:

- Clean and disinfect calving pens after use
- Calve cows in clean, dry, dedicated maternity areas
- Removing calf from maternity pen quickly following birth
- Collect colostrum from clean udders (prepare udders as if for normal milking)
- Provide calves with colostrum from known negative animals
- Use pasteurized milk or milk replacer during pre-weaning period
- Raise calves separated from adult herd for first year of life (separate calf and/or heifer facilities)
- Prevention of shared access of feed/water between adults and youngstock
- Not spreading manure on youngstock grazing land

The Costs and the Benefits:

If all of the above strategies were implemented, it would cost an average Canadian herd $1,200 in the first year and a recurring cost of $660 in subsequent years to maintain. This may seem steep, but it is estimated that a profit of $2,278 per year would be achieved with the control of JD[7]. Many farmers already have these strategies implemented and are well on their way to reducing the impacts of JD; implementing a few more of the strategies listed above could have a significant effect on your bottom line!

What About Testing & Culling?

Reducing the number of infective animals within the herd is also a beneficial strategy to reduce JD. Testing all animals and culling those that are positive has been a suggested strategy; however, this needs to be combined with the management strategies highlighted above to have the greatest impact[6]. In fact, within several years of program implementation, the level of MAP-positive cows in the herd could be expected to decrease approximately by 50%[12].

Take Home Messages

As highlighted above, JD is both a costly and common disease on Canadian dairy farms. To control the spread, infected animals should be prevented from entering non-infected herds. Within an infected herd, additional effort should be made to prevent fecal contamination from adult animals to prevent transmission to young calves.

You and your veterinarian can develop a strategy involving the above mentioned strategies to help reduce the impact of JD on your farm.

References for Johne's disease

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