Bovine Leukosis Virus

Bovine leukosis, caused by bovine leukemia virus (BLV), is a production-limiting disease commonly found in Canadian dairy herds.

What's the Impact?

BLV is a common disease in the Canadian dairy industry that infected herds must actively control and uninfected herds must work diligently to prevent[1-3]. Clinical signs of disease (e.g. weight loss, inability to stand, enlarged lymph nodes, tumors) are not often displayed by infected animals, while clinical signs of malignant lymphosarcoma (cancer) develop in < 5% of infected animals[3]. Despite the low prevalence of clinical signs, cows that have been infected with the virus have significant consequences, including[4,5]:

- **Reduced immune function**
- **Reduced lifetime milk production and cow longevity**
- **Carcass condemnation at slaughter**
- **Lower reproductive efficiency**

What Does it Cost You?

This disease is a major "silent" threat to the health and productivity of dairy cows because clinical disease often goes undetected. American and Canadian researchers have reported that costs range from $412[6]-635[7] per infected cow. **This means the disease could cost between $12,000-19,000 per year for the average infected Canadian dairy herd (assuming 100 milking cows).** *All costs listed in Canadian dollars.*

Where Does it Come From?

The source of BLV is other infected cattle. These animals serve as a source of transmission between cattle and other farms. The virus is predominantly spread through the transfer of blood from an infected to susceptible animal. Biosecurity is crucial in order to control between- and within-herd transmission. Several countries have officially eradicated BLV using either specific management interventions, test and segregation, and/or test and slaughter protocol; it is possible with stringent biosecurity protocols and robust testing to eliminate this costly disease!

As infection with this virus is permanent and untreatable, every effort must be made to prevent these animals from entering the herd!

Biosecurity Between Farms

The leukemia virus relies on the introduction of persistently infected cows that do not show obvious clinical signs to allow for transfer between herds. This is why maintaining a closed herd, or purchasing from low-risk herds, or tested animals, is critical to control. If purchasing is required, it is highly recommended to test all newly introduced cattle prior to arrival to the farm using a blood test; herds that do not test purchased animals have higher levels of BLV on their farm[1]. As infection with this virus is permanent and untreatable, newly arrived cattle that are infected serve as a continuous source for spreading the virus. Every effort must be made to prevent these animals from entering the herd!

Biosecurity Within Farms

As highlighted below there are many risk factors (factors associated with a higher level of leukosis) and protective factors (factors associated with lower levels of leukosis) that have been identified.

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MANAGEMENT

- Changing gloves between cows during pregnancy exams[1]
- Using artificial insemination[8]
- Feeding heat treated colostrum or colostrum replacers[5]
- Disinfection of blood-contaminated equipment (ear taggers, dehorning irons) between animals[5]
- Segregation and culling of cows that test positive for leukosis[5]
- Purchasing animals with unknown infection status[1]
- Lack of fly control[8]
- Gouge dehorning[8]
- Reusing needles[8]
- Breeding with a bull[8]

PROTECTIVE FACTORS

RISK FACTORS

Control Strategies

Based on these risk factors, there are a variety of control strategies that could be put into place including[7]:

1. **Improving management practices to reduce spread of disease**

2. **Identifying and removing positive animals from the herd**

3. **Rather than culling, keep infected animals in a separate pen, away from the herd**

Management

Each of the following strategies have been identified as factors associated with a reduction in leukosis and could be implemented with relative ease, but must be done consistently in order to be effective by everyone working with animals on your farm:

- Fly control
- Disinfection of equipment between animals
- Use of cautery dehorner
- Single use needles
- Single use examination sleeves for AI and pregnancy diagnosis
- Use of frozen or pasteurized colostrum or colostrum replacer

The Costs and the Benefits:

When implementing all these management strategies, it was estimated to cost approximately $32-85 (depending on whether a colostrum replacer was fed) per cow, per year[7], but it was estimated that the within-herd level of leukosis would fall by 25%! Despite the cost associated with prevention and management strategies, it led to an additional increase in profit per animal of $79-132 per year[7] by preventing reproductive inefficiencies and production losses, highlighting the success of using these strategies. If your herd has a high level of leukosis, this may be the best strategy to consider initially.

Test & Cull

This strategy focuses on identification and resulting culling of positive animals.

The Costs and the Benefits:

One research study used this approach but chose not to cull all positive animals and instead culled 10% of positives (to ensure the herd size remained constant), but culled in combination with the application of all management strategies mentioned above. They estimated this would cost $35 per cow per year, but yield an increased profit of $159 per year[7].

Test & Segregate

The segregation of positive animals in a separate pen has been demonstrated as an effective way to prevent new infections within a herd.

The Costs and the Benefits:

When combined with the implementation of all above mentioned management strategies (#1), researchers estimated a cost of $46 per cow per year. This strategy led to a profit of $159 per cow per year and had the highest rate of reduction in the number of cows infected with leukosis in the barn[7].

Take Home Messages

Bovine leukosis is a common and costly infection on dairy farms in Canada. Similar to other infectious diseases, the best option to prevent this virus from coming onto your farm is to refrain from purchasing and introducing potentially infected animals. The disease can be eradicated using a combination of management strategies and test and cull/segregate options.

Work with your veterinarian to develop objectives and a strategy to achieve them to reduce the risk and potential impact on your farm caused by BLV!

References for Bovine Leukosis

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