

Hidden From Birth: How Bovine Leukemia Virus Affects Young Calves

Understanding the early-life impact of Bovine Leukemia Virus on herd health and productivity

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Background

Bovine leukemia virus (BLV) is far from new in Ontario's dairy industry. It's a bloodborne virus that quietly spreads through herds and has reached high levels across the province. A recent surveillance study found that 88% of Ontario dairy herds had at least one positive test for BLV based on bulk tank milk samples. While most infected adult cows don't show obvious signs of illness, the virus is far from harmless. It's been linked to suppressed immune function, reproductive problems, decreased milk production, and even tumors in some cases. Infected animals are more likely to be culled, and their carcasses may be condemned, costing producers money and reducing overall productivity.

But what many producers may not realize is that BLV isn't just an issue for adult cow, it may also be affecting calves, and much earlier than previously assumed.

New Research: BLV Starts Young

A recent cohort study conducted at a commercial calf-raising facility in Southern Ontario between May 2023 and May 2024 followed dairy calves for their first 84 days at the facility. These calves, estimated to be around 3 to 10 days old at arrival, were sourced from local dairy farms, and auctions. Researchers took blood samples from each calf at three time points: upon arrival, at day 30, and again at day 83. Samples were analyzed to detect the presence of BLV.

Out of 733 calves tested, 43 (5.9%) tested positive for BLV at one point in the study period. While none of the BLV-positive calves died during the trial, they did show significantly worse respiratory disease compared to their BLV-negative counterparts.

What Does BLV Do to Calves?

A closer look revealed troubling trends in respiratory health.

Compared to BLV-negative calves, those that tested positive for BLV:

- Had nearly twice as many observations with clinical signs of respiratory disease (such as nasal discharge, coughing, and labored breathing).
- Had fewer days with no signs of respiratory illness.
- Were more likely to score poorly on standardized respiratory exams.

These findings suggest that even in very young calves, early BLV infection may impair the immune system's ability to defend against respiratory pathogens.

What About Growth, Diarrhea, and Feed Efficiency?

Interestingly, the study did not find a statistically significant association between BLV status and

average daily gain (kg/d), feed efficiency (ME/kg of gain), or incidence of diarrhea. This may seem reassuring at first glance, but the story may be more complex.

Respiratory disease is known to have a negative effect on growth in calves, particularly in the first few months of life. It's possible that the indirect effects of more frequent respiratory illness in BLV-positive calves could still impact growth performance over a longer period. More follow-up is needed to assess those potential longer-term effects.

Why Might BLV Cause Respiratory Issues?

BLV attacks cells that play a critical role in immune response. In adult cows, studies have shown that BLV impairs immunity by reducing the ability of the “first defense” cells to respond to infections. It also lowers the effectiveness of vaccines, leading to weaker immune responses.

While this immune suppression has been well documented in adult cattle, this study raises concern that similar effects may occur in young calves infected early in life. If calves are infected within the first few days or weeks, their ability to fight off respiratory infections or respond to vaccines, like those administered in early life, may be compromised.

Takeaways for Ontario Dairy Producers

BLV may be silently impacting calf health earlier than previously believed, and the consequences appear to be concentrated around respiratory health.

Here are the key considerations for producers:

Start Thinking About BLV Control Early

- Calves in this study tested positive for BLV as early as a few days after birth, indicating they were likely infected at the dairy farm of origin.
- This emphasizes the importance of biosecurity, colostrum management, and BLV testing at the source farm.

Monitor and Support Respiratory Health in Young Calves

- Even without obvious illness, BLV-positive calves showed signs of weakened respiratory defenses.
- Subtle symptoms like nasal discharge, cough, or slight lethargy could be early indicators of disease. These calves may benefit from closer monitoring and prompt treatment.

Next Steps

More research is needed to fully understand how BLV affects calves, particularly in terms of immune development, and long-term performance. However, the current findings already suggest that calf health protocols should account for the possibility of early BLV exposure.

With such a high prevalence in Ontario herds, chances are your calves could be at risk. Reviewing colostrum protocols, and respiratory disease management strategies could go a long way in protecting youngstock and future herd performance.