

Using DNA Pooling for Breeding Management in Commercial Cow-Calf Herds

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Background: The Canadian beef industry is challenged to remain globally competitive while improving efficiency and sustainability. To address these challenges, the beef industry must continue to evolve using advanced technologies such as genomics. Decreasing genotyping cost has led to the adoption of genomic tools by the seedstock sector; however, these costs continue to be a barrier for the commercial beef sector, where data collection is minimal and sire is often unknown. An innovative approach to reducing the cost and labour associated with genotyping is DNA pooling, where information is collected on a group of individuals. This method can be used to measure and manage group-level breed composition and hybrid vigour.

Goal: to increase the accessibility of genomic management to commercial beef producers to improve efficiency, profitability and sustainability

Objectives: to validate a low-cost DNA tool to monitor herd level genomic breed composition, hybrid vigour and sire contribution using DNA pooling

- 1) Monitor 10 commercial cow-calf herds for herd-level breed composition, hybrid vigour and sire contribution using DNA pooling
- 2) Determine the effect increasing herd-level hybrid vigour on economic performance and green house gas emissions
- 3) Develop herd-specific strategies to retain and/or increase hybrid vigour
- 4) Determine the effect of grouping strategies (coat colour and cow age; coat colour, breed composition and hybrid vigour; and pregnancy test outcome and cow age) on offspring performance
- 5) Determine the effect of grouping strategies (by breed composition, hybrid vigour and sire contribution) on carcass uniformity

Benefit to the Industry: DNA pooling may “open the door” for commercial producers to use this cheaper genotyping strategy for breeding management. DNA pooling can also be used to develop grouping strategies to increase carcass uniformity and value. Finally, increasing hybrid vigour on the herd level can improve health and resilience, reduce carbon footprint and result in improved economic net returns.