

Development and Demonstration of a Genomic-Enhanced Whole Herd Genetic Management Platform to Improve Beef Production Efficiency and Quality

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Background: Constant improvement of beef production efficiency and quality is essential to enhance the competitiveness of the beef industry. A key strategy to improve beef production efficiency and quality is to manage the genetics of the whole cattle herd to achieve optimal beef production performance. The best genetics of a beef cow herd is represented by animals that have both top genes inherited from their parents and optimal combinations of parental genes that result in retained hybrid vigor. However, whole herd genetic management is not widely used as beef producers lack effective and easy access science-based tools to select and breed more efficient cattle. Researchers at Livestock Gentec (AAFC, AAF and UAlberta) have developed various genomic prediction tools including a genomics enhanced whole herd management platform.

Goal: to improve beef production efficiency and quality through increased genomic prediction accuracy and a platform to aid producers in herd genetic management

Objectives: to refine and demonstrate the genomics enhanced whole herd management platform to the beef industry

- 1) Develop advanced genomic tools to improve prediction of genetic merit for growth, feed efficiency, carcass quality, fertility and greenhouse gas emission traits.
- 2) Develop and refine multiple trait selection indexes including a custom user defined index
- 3) Develop a mating selection tool to maximize genetic potential of a cattle herd.
- 4) Demonstrate the application of the genomic-enhanced whole herd genetic management platform by analyzing 10,000 beef cattle, in partnership with the Emissions Reduction Alberta (ERA) project, from participating beef producers.
- 5) Use the whole herd management portal to deliver genomic information to producers to aid in selection decisions and management of genetics.

Benefit: The platform will allow beef producers to easily access information on the genomic profile of their herd including status or ranking of genetic merit for production traits and hybrid vigour. Based on the genomic profile, producers will be able to select breeding stock (sire and dam) that will optimize genetic gain and improve efficiency and profitability.