

Development of a Functional Genomic Prediction Platform for Industry Application

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Background: Genetic improvement of beef production efficiency and carcass quality is a key strategy to enhance national and international competitiveness and sustainability of beef production. However, the rate of genetic improvement using traditional phenotype and/or pedigree based genetic evaluation and selection has been slow for important beef performance traits that are difficult/expensive to measure, such as feed efficiency. In recent years, researchers at Livestock Gentec (AAFC, AAF, UAlberta) developed a number of genomic prediction tools including genomic prediction of genetic merit for feed efficiency and carcass traits, genomic prediction of breed composition and retained hybrid vigour, and multiple trait selection indexes. These genomic tools have been developed for commercial producers who do not have access to herd improvement tools from a breed association and who want to select the best replacement animals from their own herd.

Goal: to promote the wider application of genomic tools, particularly in commercial cattle producers, and to improve efficiency and quality in the beef industry

Objectives: to refine genomic prediction tools to improve prediction accuracy for multiple beef breeds by increasing genotype and phenotype data for a number of production traits

- 1) Increase genotype and phenotype data from multiple beef breeds and analyze multiple layers of beef cattle “omics” data
- 2) Develop a genomic prediction platform with modules that include animal DNA marker input, reference population database management, prediction of genetic merit, and consolidation of pipelines for analyzing genomic data
- 3) Improve genomic prediction for production traits, breed composition, retained hybrid vigour and multiple trait selection indexes

Benefit: The genomic prediction platform with improved accuracy will help service providers to deliver genomic decision support tools to their customers, which will allow the beef industry to improve beef production efficiency and quality via selection and management of genetics in their herd.



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