Marker assisted selection using simulated IGF2 gene in Canadian Landrace

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Marker Assisted Selection (MAS) can increase the accuracy of selection in comparison to accuracy from conventional Best Linear Unbiased Prediction (BLUP). One of the major genes in the pig is Insulin-like growth factor 2 (IGF2) which has a large effect on muscle mass. The objective of this study was to investigate the advantage of using IGF2 paternal alleles on the accuracy of selection in MAS using simulated data. A population with almost one million pigs was simulated using the QMSim package (Schenkel and Sargolzaei, 2008). This simulated population was based on the Canadian Landrace population which existed in the national database managed by the Canadian Centre for Swine Improvement (CCSI). Data was simulated using heritability of 25% and with 15% of the phenotypic variance under the effect of the simulated IGF2 gene. Selection was at random because when simulation was performed with a major gene such as IGF2 and selection was by using BLUP, the major gene became fixed after a few generations. The proportion of genotyped animals was approximately 0.05% of the population and mostly chosen from recent generations. A software program was developed for estimation of genotype probabilities of the entire pedigree using the genotype information of relatively few genotyped animals. Estimated paternal allele probabilities of the simulated IGF2 gene were used as a covariate in the model. The observed accuracy of Estimated Breeding Value (EBV) for BLUP and MAS for genotyped animals were 71% and 80%, respectively.

KEYWORDS
IGF2
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