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## Introduction

Across-breed genomic prediction using SNP marker panels has been associated with low accuracy, particularly for genetically distant breeds.

Whole genome sequence (WGS) data would cover genetic markers at or in high linkage disequilibrium with causative chromosomal regions.

### Objective:

In this study, the accuracy of across-breed genomic prediction was assessed using either standard 50k SNP genotypes or 50k SNP genotypes plus 2,590 selected markers from WGS.

## Methods

Genomic prediction was based on genomic best linear unbiased prediction (GBLUP) and considering 350 independent purebred **Border Leicester (BL)** animals as test set.

Reference sets for genomic prediction were: a) 1,764 to 1,930 purebred BL, b) 2,382 to 3,635 purebred Merinos (Mer) or c) 13,074 to 15,864 mixed purebred and crossbred animals other than BL breed.

The studied traits were weight (PWT), scanned fat (PCF) and scanned eye muscle depth (PEMD) measured at post weaning age. Selection of genetic markers was based on genome-wide association study using WGS, performed on a large multi-breed sheep independent data set.

## Results

Accuracy of within breed genomic prediction in BL was on average 0.28 which increased to 0.32 by using selected SNPs from WGS data.

Across-breed prediction accuracy for BL was on average 0.10 which increased to 0.17 by using selected SNPs from WGS markers with 50k genotypes.

Bias of genomic breeding values tended to be less based on prediction from 50k integrated with selected markers from WGS than 50k only.

Figure 1. Prediction Accuracy for BL animals from BL, Merino or mixed purebred xbred non BL reference set

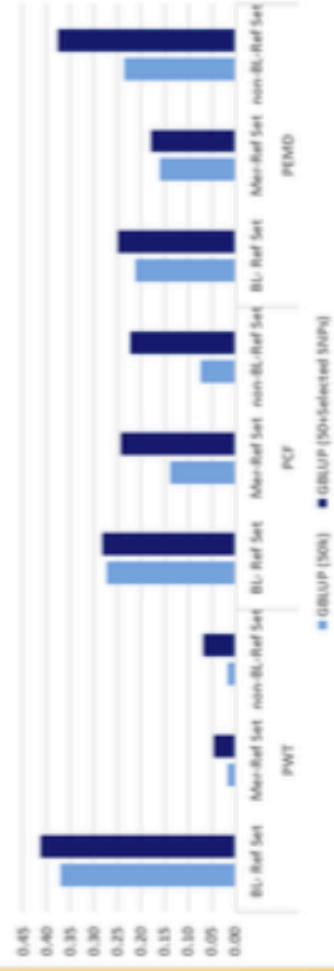


Table 1. Regression coefficient of GBV from adjusted phenotypes.

Trait	Reference Set (size)	Target Set	50k	50k & Selected SNPs
PWT	BL (1,553)	BL	1.40	1.30
	Merino (3,535)	BL	0.05	0.88
	non BL (15,864)	BL	0.02	0.54
PCF	BL (1,553)	BL	0.87	0.66
	Merino (2,382)	BL	1.74	1.05
	non BL (13,074)	BL	0.02	0.81
PEMD	BL (1,553)	BL	1.16	1.17
	Merino (2,382)	BL	0.13	0.21
	non BL (13,074)	BL	0.79	0.59