



LIVESTOCK GENETIC SERVICES

PEDIGREE + PERFORMANCE + GENOMICS

John Genho

NBCEC Brown Bagger Series

Models for Genomic Enhanced EPDs

Single Marker Tests



Models for Genomic Enhanced EPDs

Single Marker Tests

- Included individual SNPs into EPDs as fixed effects
- Associated calpain and calpstatin SNPs with tenderness; and thyroglobulin with marbling

Models for Genomic Enhanced EPDs

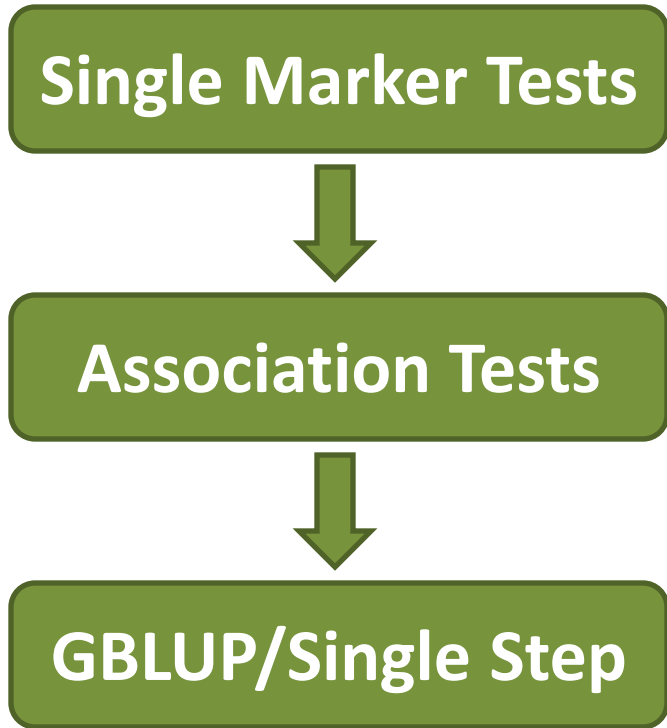
Single Marker Tests



Association Tests

- Included Pfizer (now Zoetis) and Igenity MBVs in EPDs as correlated traits
- Method relies on genetic correlation between trait of interest and MBV – was not high for populations I was working with
- Could not get genotypes from companies – only MBVs – which were less useful as predictions were updated

Models for Genomic Enhanced EPDs

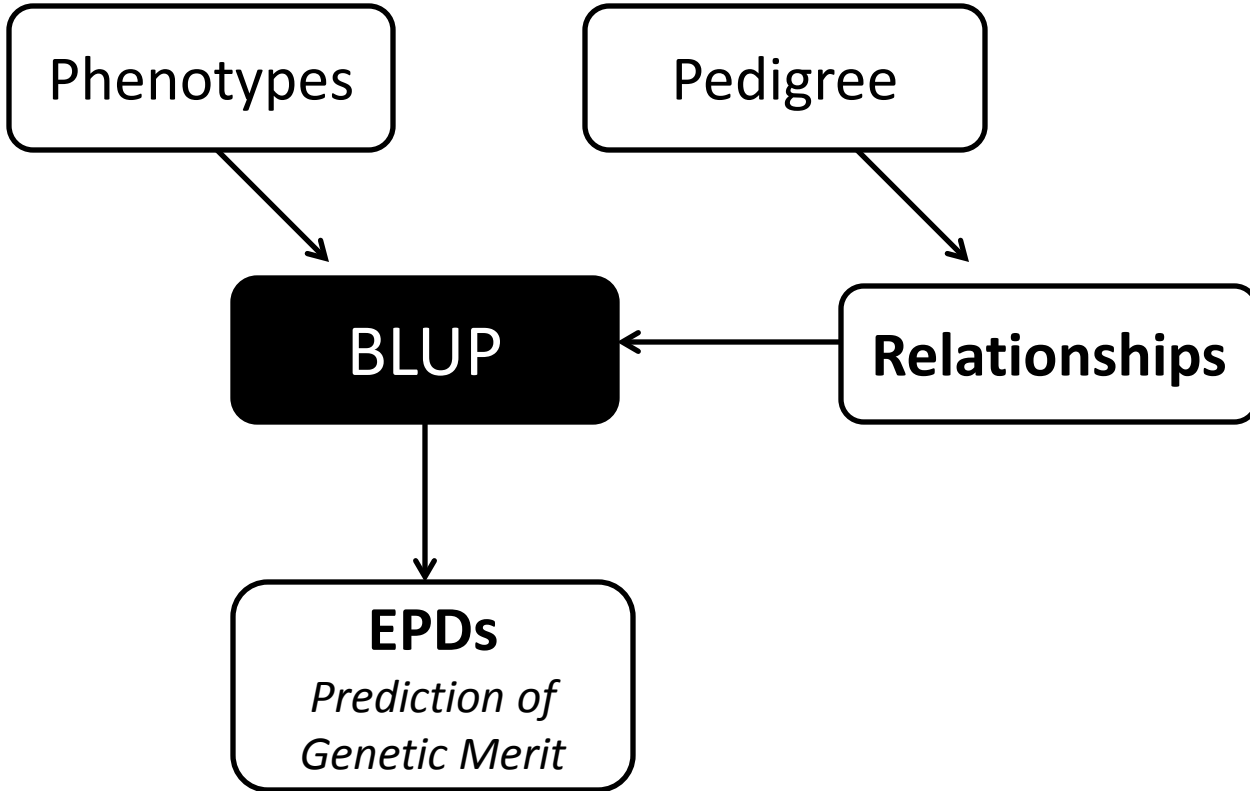


What is GBLUP?

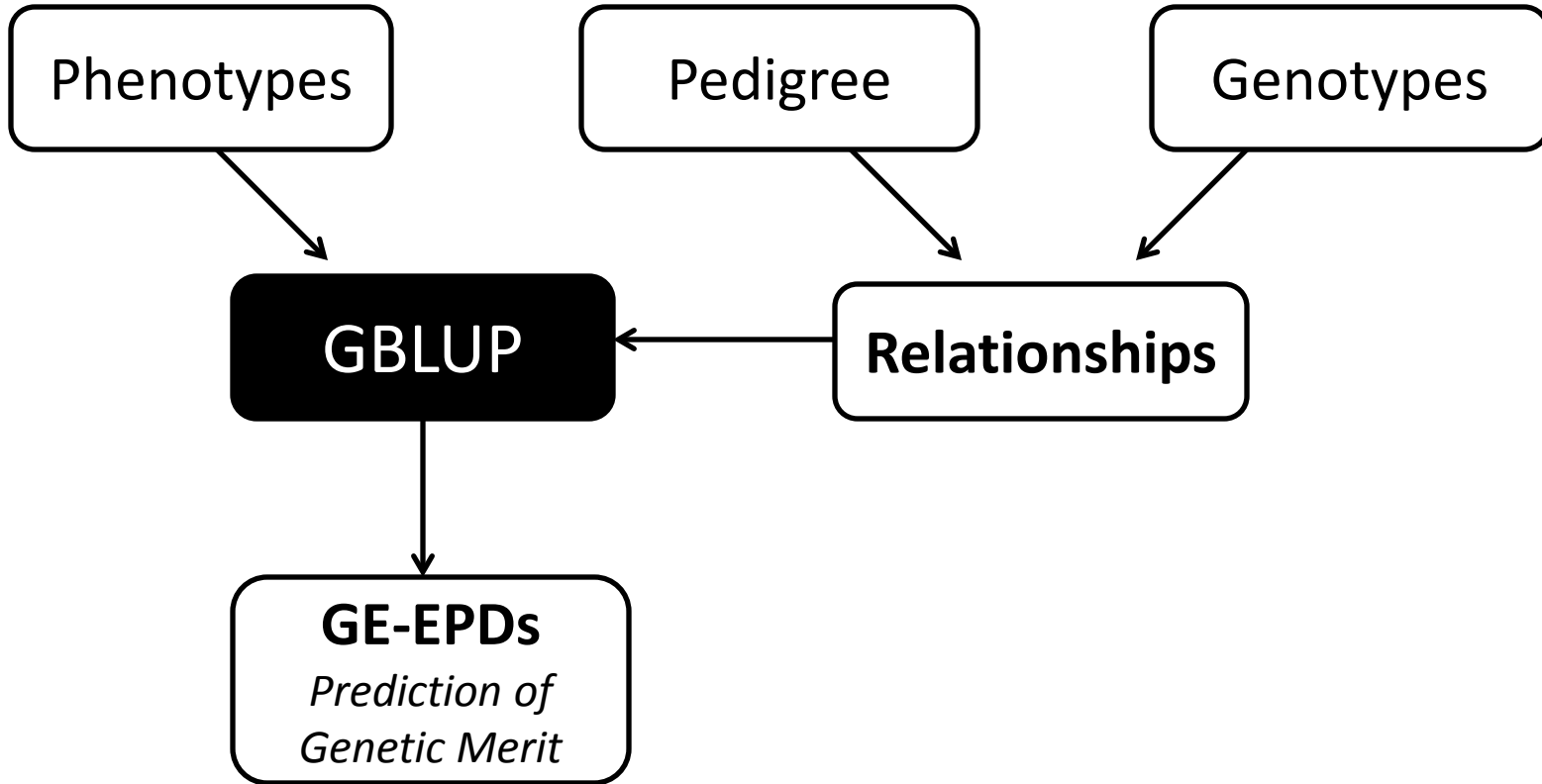
$$\begin{bmatrix} X'R^{-1}X & X'R^{-1}Z \\ Z'R^{-1}X & Z'R^{-1}Z + H^{-1} \otimes G_0^{-1} \end{bmatrix} \begin{bmatrix} \hat{b} \\ \hat{u} \end{bmatrix} = \begin{bmatrix} X'R^{-1}y \\ Z'R^{-1}y \end{bmatrix}$$

$$H^{-1} = A^{-1} + \begin{bmatrix} 0 & 0 \\ 0 & G^{*-1} - A_{22}^{-1} \end{bmatrix}$$

BLUP



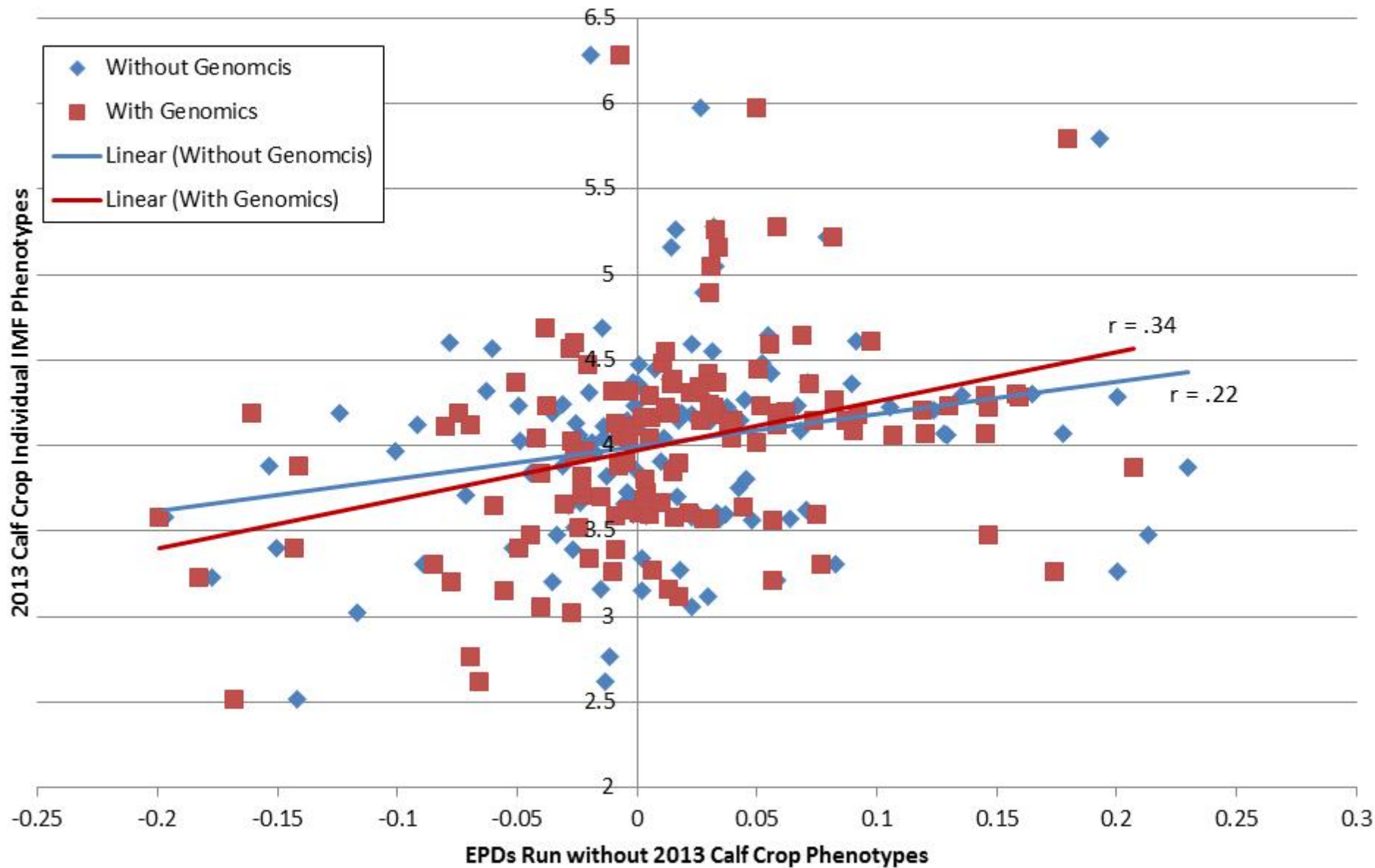
GBLUP



“All models are wrong, but some are useful.”

George Box

Correlation for IMF between Actual Performance and EPDs



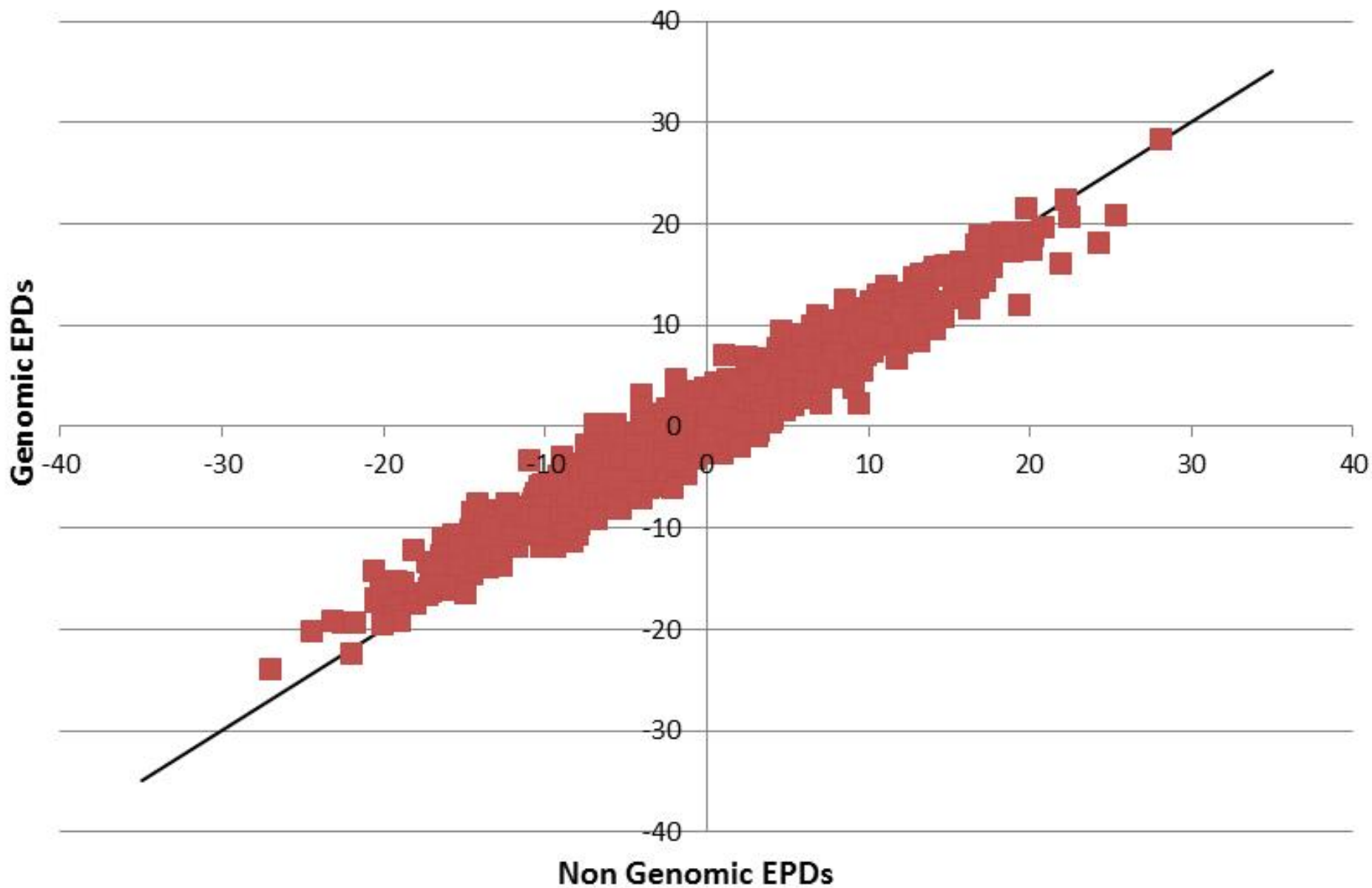
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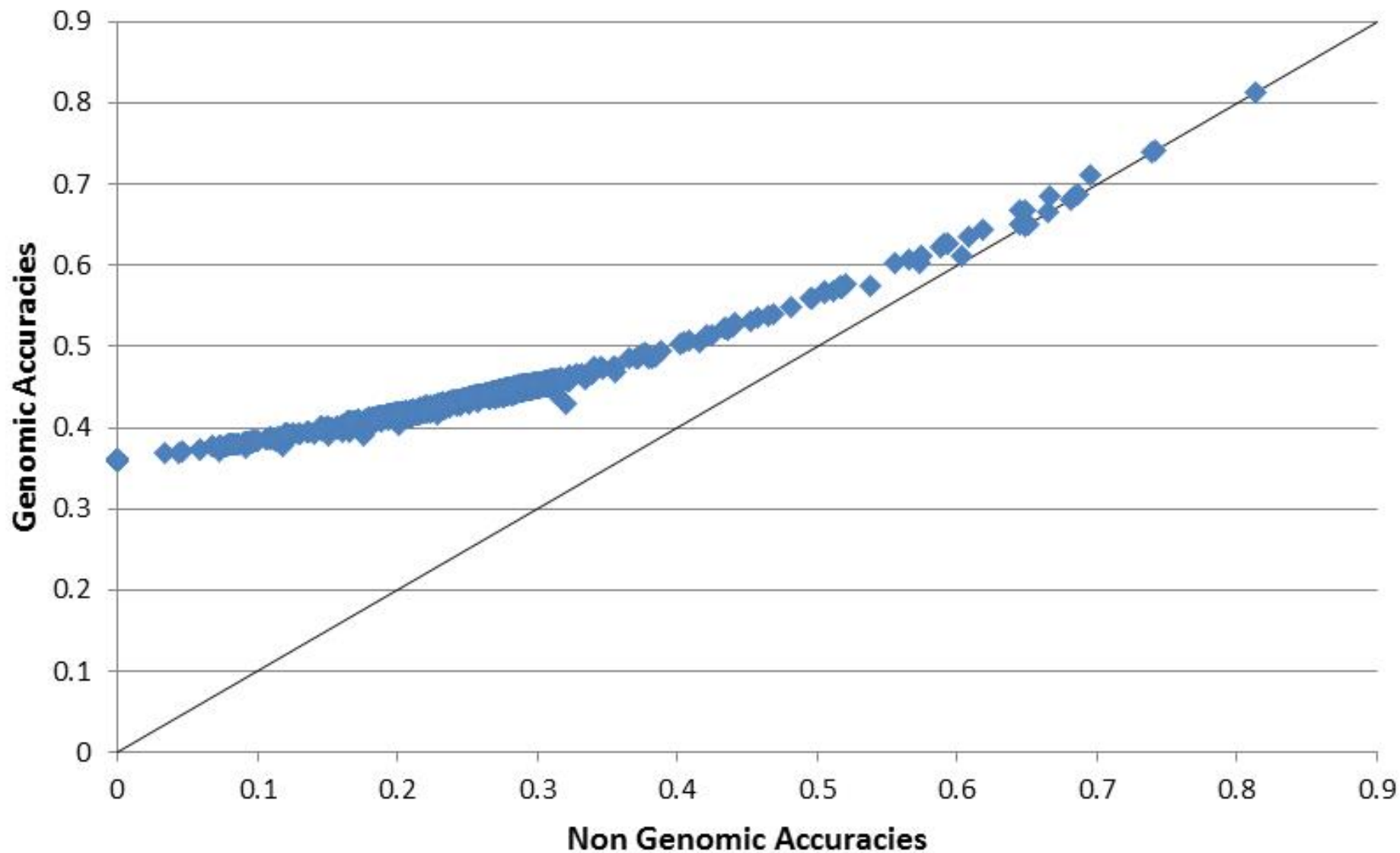
SGBI Accuracy vs Change in EPDs



Weaning Weight Comparison



Weaning Weight Accuracy Comparison



Implementation

- Currently have GBLUP implemented at:
 - Santa Gertrudis Breeders International
 - Deseret Ranches
 - King Ranch
 - Eldon Farms
- Evaluating implementation at:
 - International Brangus Breeders Association
 - American Braunvieh Association

Questions??



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