KEEP CALM

AND

BLEND

EBV

TO GET MORE GENETIC GAINS

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Interbeef?

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Across-Country Genetic Evaluation for beef cattle

Current research:
- Female Fertility & Carcass
- Angus & Hereford
- Linking with Australia

INTERBEEF

9 Countries

2 official runs x2 yearly:
- Calving & Weaning Weight
- Direct & maternal traits

3 beef breeds: Charolaise, Limousine & Simmental

Objective

- To Explore & Validate a method for integrating Interbeef EBVs into the Irish genetic evaluation

Weaning weight data

Reduced Irish evaluation

- 20,390 phenotypes purebred Limousin

- Single trait (direct & maternal effects)

- 48,345 EBVs & rel.

Full Interbeef evaluation

- 1,2M phenotypes purebred Limousin

- Multi-country (direct & maternal effects)

- 2,7M EBVs & rel.

- ~580,000 pub. EBVs & rel.

- ~68,000 pub. in Irish scale

Preparing for Integration

1. Computation of ERC* from rel.

| ERC$_{IRLdirect}$ | ERC$_{IRLmaternal}$ | ERC$_{InterbeefDirect}$ | ERC$_{InterbeefMaternal}$ |

2. Computation of DRP** from EBV & ERC

| DRP$_{IRLdirect}$ | DRP$_{IRLmaternal}$ | DRP$_{InterbeefDirect}$ | DRP$_{InterbeefMaternal}$ |

All ERC & DRP were computed separately using MiX99

*ERC = Effective Record Contribution

**DRP = Deregressed Proof

Avoiding x2 counting

- Because Irish phenotypes are both in the domestic and the Interbeef runs

- Computation of corrected ERC & DRP

$ERC^* = ERC_{Interbeef} - ERC_{IRL}$

$DRP^* = [ERC_{Interbeef} \times DRP_{Interbeef} - ERC_{IRL} \times DRP_{IRL}] \times ERC^{*-1}$

Integration Step

- Required some adaptations of the Irish domestic model

$$y = Xb + q_a Z_a a + q_m Z_m m + e$$

Vector of phenotypes and DRP* (weighted by ERC*)

Vector of 0/1 to associate direct DRP* & ERC* to animal effect

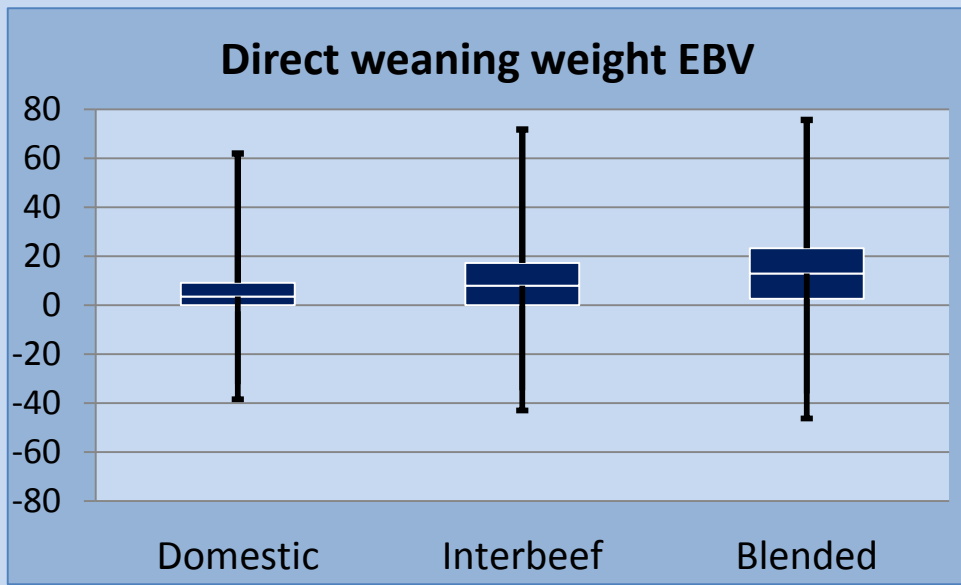Vector of 0/1 to associate maternal DRP* & ERC* to dam effect

Results: Direct EBV & rel.

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Direct weaning weight EBV

(box-and-whisker chart with y-axis from -80 to 80; categories: Domestic, Interbeef, Blended)

Direct EBV Correlation

	IRL**	ITBF*	Blend
IRL			
ITBF	0.77		
Blend	0.73	0.98	

Average Reliability Direct Effect

(bar chart with y-axis from 25 to 40; categories: Domestic, Interbeef, Blended)
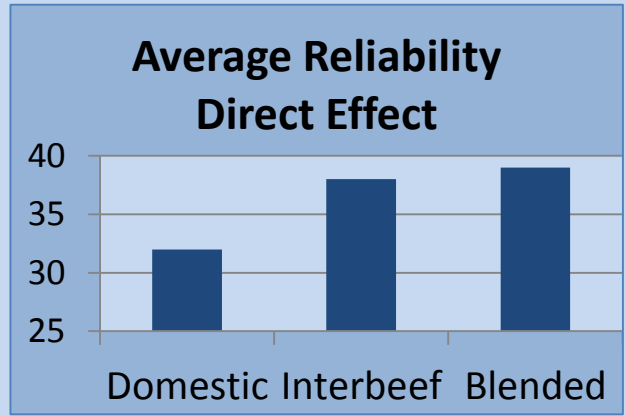
**IRL = Domestic Irish EBV
*ITBF = Official Interbeef EBV

Results: Maternal EBV & rel.

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Maternal weaning weight EBV
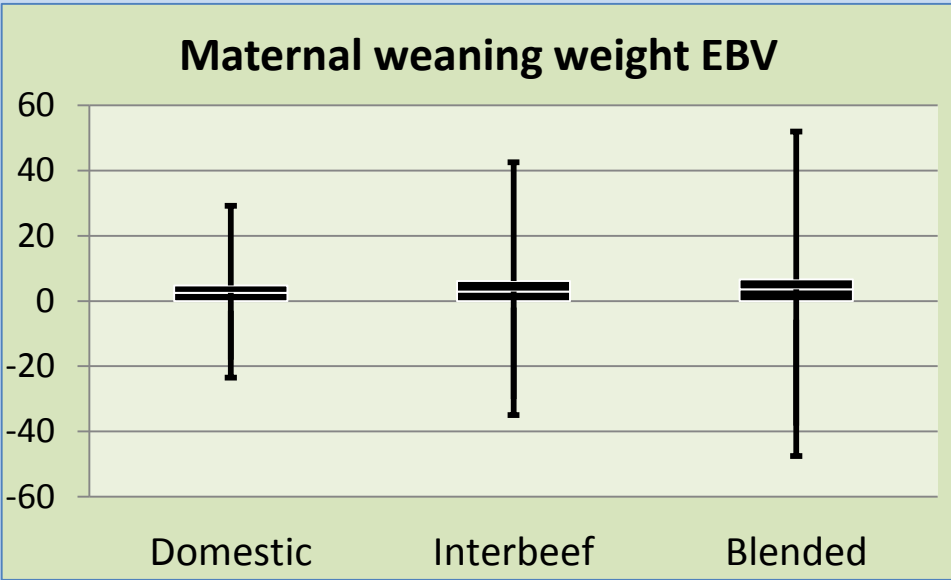
Maternal EBV Correlation

	IRL**	ITBF*	Blend
IRL			
ITBF	0.74		
Blend	0.66	0.94	

Average Reliability Maternal Effect

**IRL = Domestic Irish EBV
*ITBF = Official Interbeef EBV

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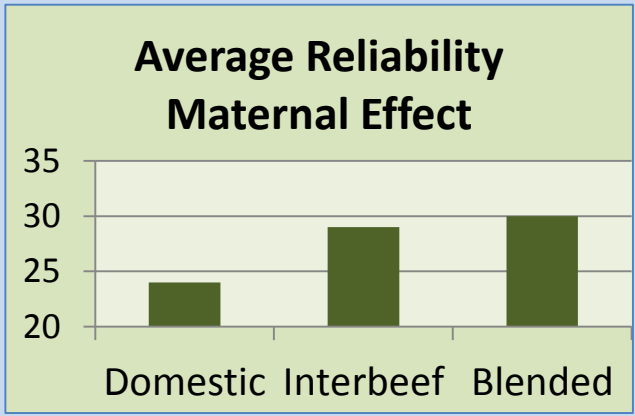
Validation of the blending

	Regression of Official Interbeef EBV on					
	Direct **blended** EBV			Maternal **blended** EBV		
	N	Corr. R	Reg.Slope	N	Corr. R	Reg.Slope
All animals	47,197	0.978	0.870	47,197	0.944	0.831
Rel. [0%-2%]	36,890	0.975	0.878	36,476	0.923	0.862
gain*]2%-20%]	4,017	0.976	0.864	4,983	0.951	0.819
]20%-50%]	4,792	0.987	0.902	5,117	0.984	0.788
]50%+]	1,498	0.995	0.932	621	0.993	0.845

	Regression of Official Interbeef EBV on					
	Direct **domestic** EBV			Maternal **domestic** EBV		
	N	Corr. R	Reg.Slope	N	Corr. R	Reg.Slope
All animals	47,197	0.766	1.195	47,197	0.735	0.903

*Rel. gain = Interbeef reliability – Domestic reliability
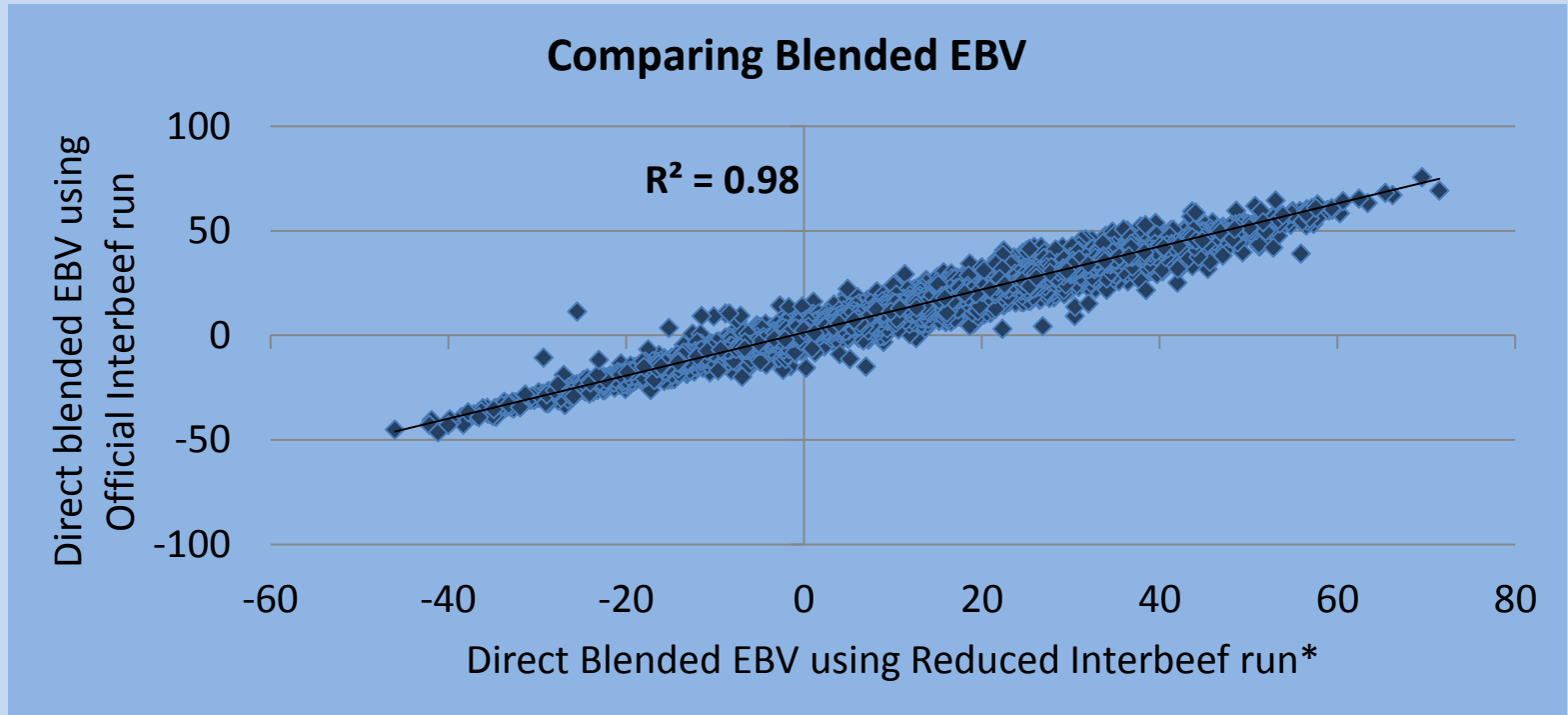
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Validation of x2 counting correction

Comparing Blended EBV

R² = 0.98

Direct blended EBV using Official Interbeef run (y-axis, 100 to -100)

Direct Blended EBV using Reduced Interbeef run* (x-axis, -60 to 80)

*Reduced Interbeef run = Interbeef run with Irish data set to missing.

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Conclusion

- Good performance of the blending process using official Interbeef run
  - More development for better inclusion of maternal traits
- Extension to
  - Full multi-trait domestic model
  - Other beef traits
  - Dairy model

Thank you

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