Genomic predictive ability for growth, carcass and temperament traits in Nelore cattle

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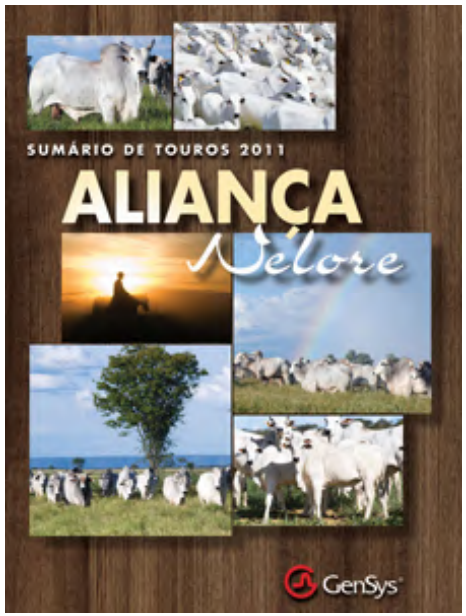
The Team

Zebu Genomic Consortium

The Breed

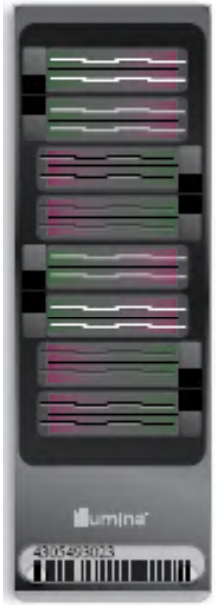
The Samples



685 Nelore bulls (after QC)

Average accuracy: **0.81** to **0.88**

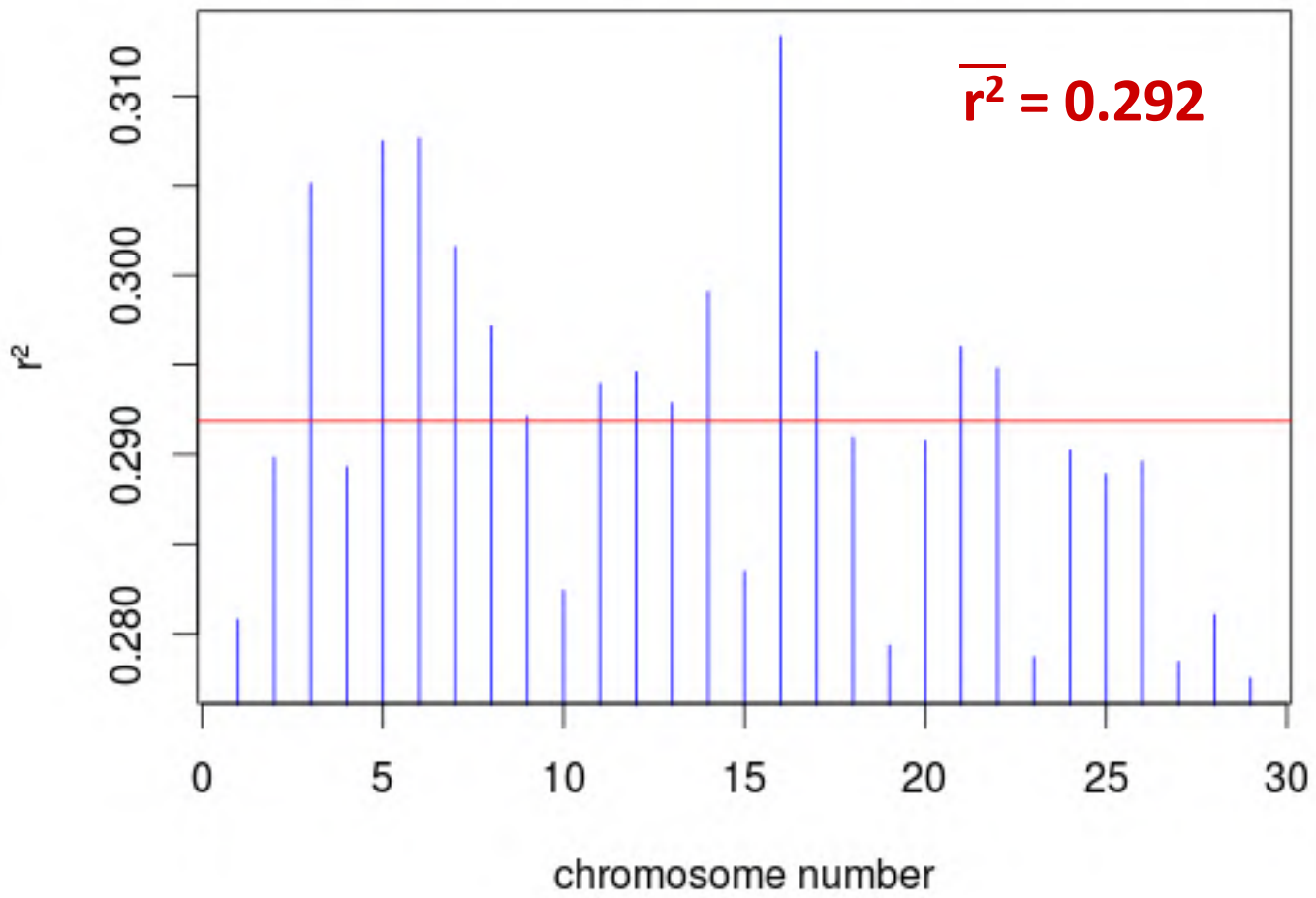
The SNPs



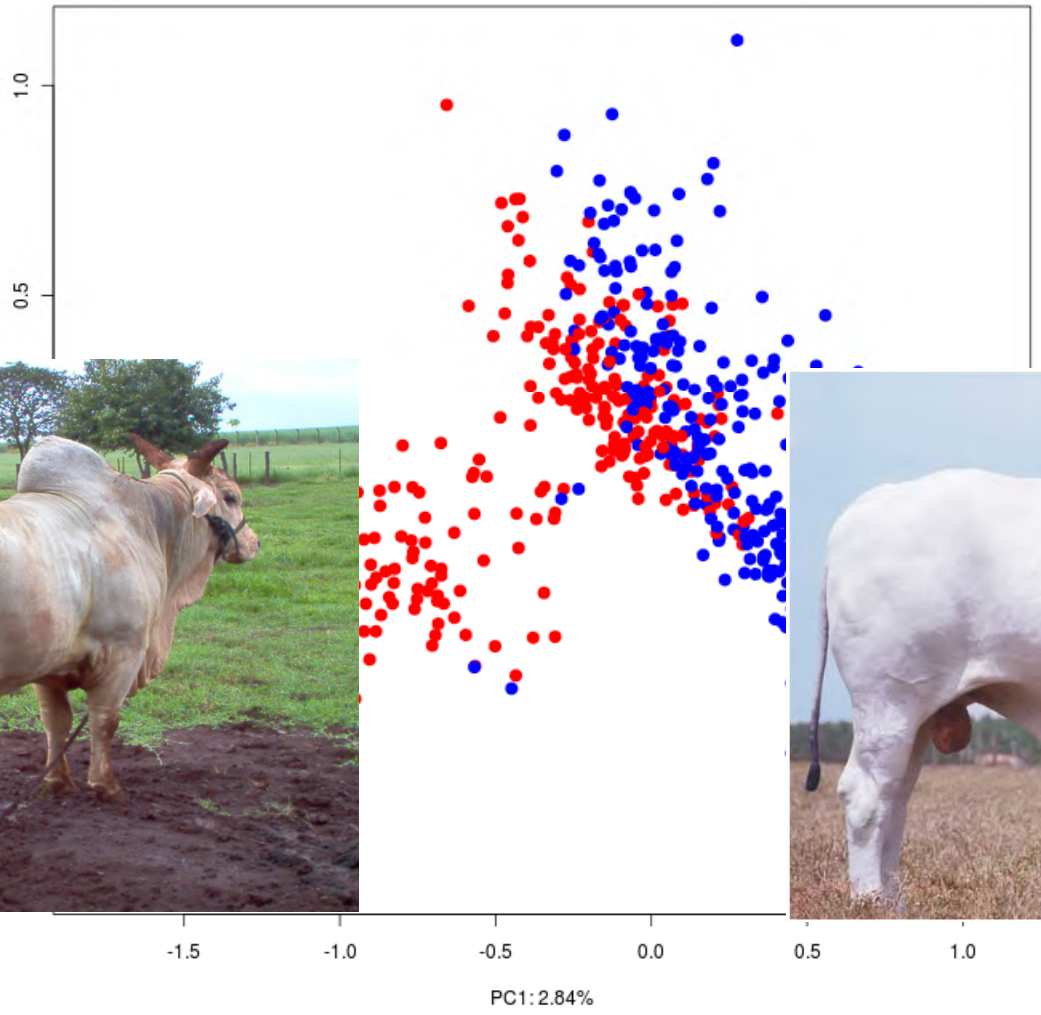
777,962	**total SNPs**
-42,669	non-autosomal
-54	same position
-174,532	MAF only
-1,539	HWE only
-98,472	SNP call rate only
-1,577	both MAF and HWE
-15,058	both MAF and call rate
-12,810	both call rate and HWE
-1,561	MAF, call rate and HWE
-109,452	r2 > 0.995
320,238	**SNPs** after QC

Linkage Disequilibrium

(adjacent markers)

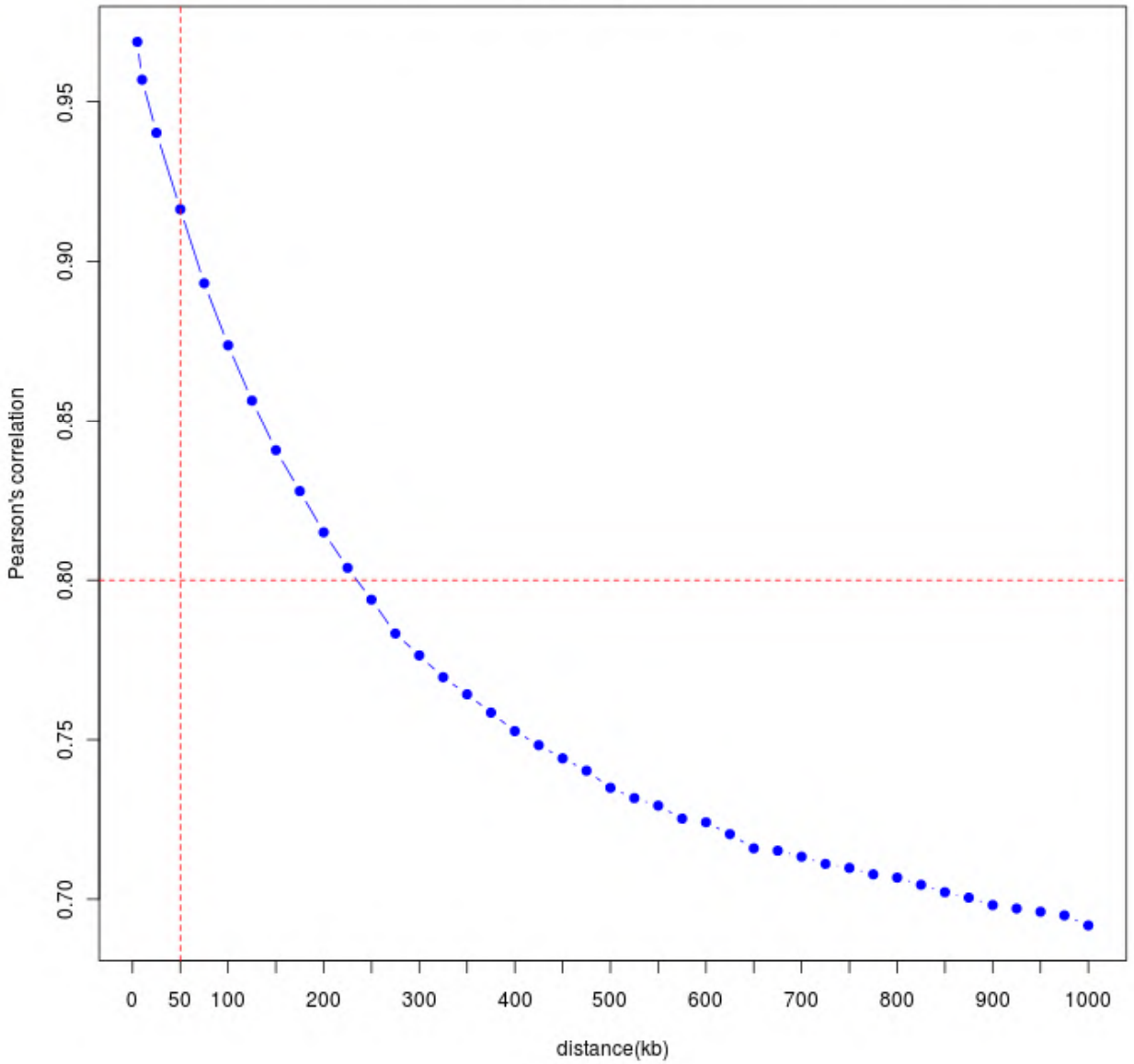


PCA Genomic Kinship



- Non registered
- Registered

Phase Persistency Nelore “subgroups”



The Traits

Birth weight (BW)

Weaning weight (WG)

Carcass conformation (Cw)

Finishing precocity (Pw)

Muscling (Mw)

Navel (Nw)

Yearling weight (PWG)

Carcass conformation (Cy)

Finishing precocity (Py)

Muscling (My)

Navel (Ny)

Temperament (Ty)

Scrotal circumference (SC)

birth

weaning (~7m)

“yearling” (~18m)

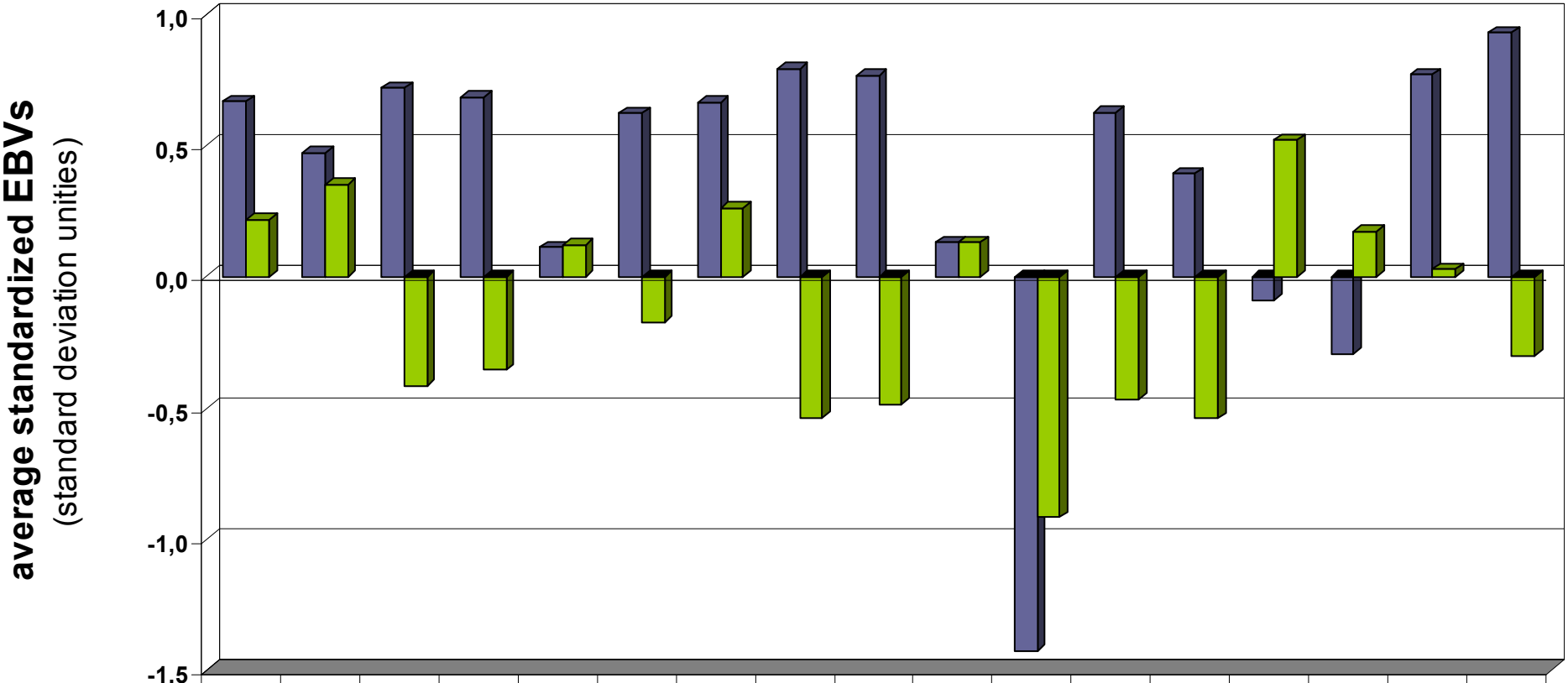
cow

Age at first calving (*phase 2*)

Gestation Length (GL)

Mature weight (*phase 2*)

Average standardized EBVs - Nelore “subgroups”



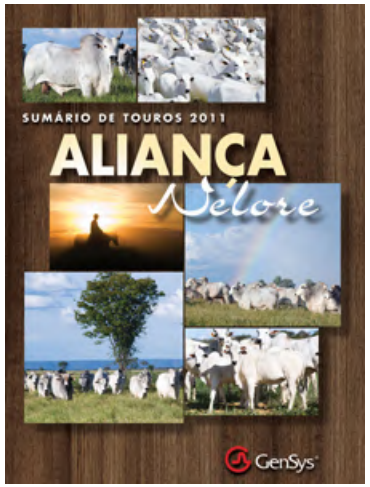
	WG	Cw	Pw	Mw	Nw	PWG	Cy	Py	My	Ny	temp	SC1	SC2	BW	GL	WI	FI
Non registered	0,67	0,47	0,72	0,68	0,11	0,62	0,66	0,79	0,77	0,13	-1,42	0,62	0,39	-0,09	-0,30	0,77	0,93
Registered	0,22	0,35	-0,42	-0,35	0,12	-0,17	0,26	-0,54	-0,49	0,13	-0,92	-0,47	-0,54	0,52	0,17	0,03	-0,30

Training and Testing Groups

Training

Sires with proofs in Nelore Aliance 2007

~ 470 sires (70%)

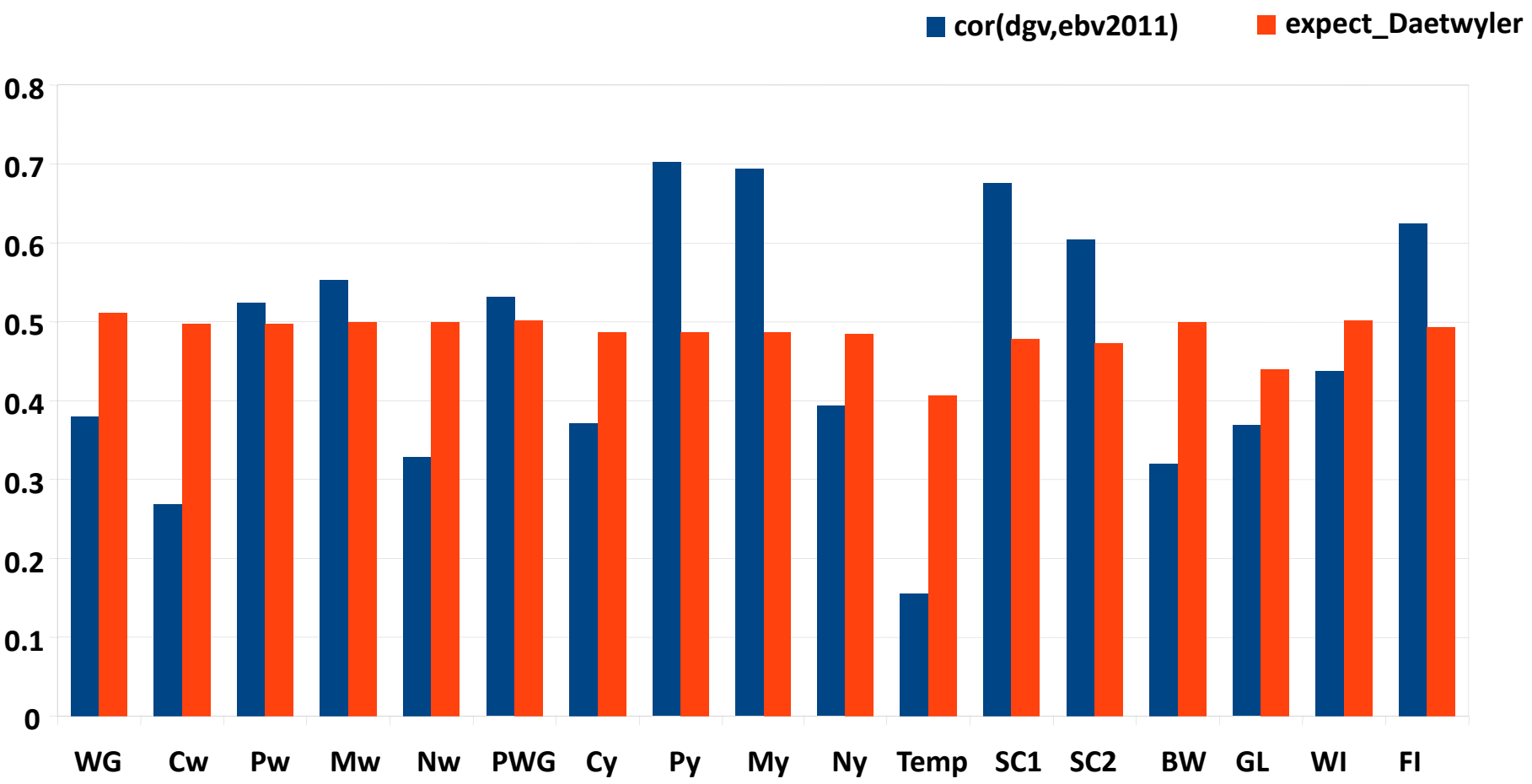


Testing

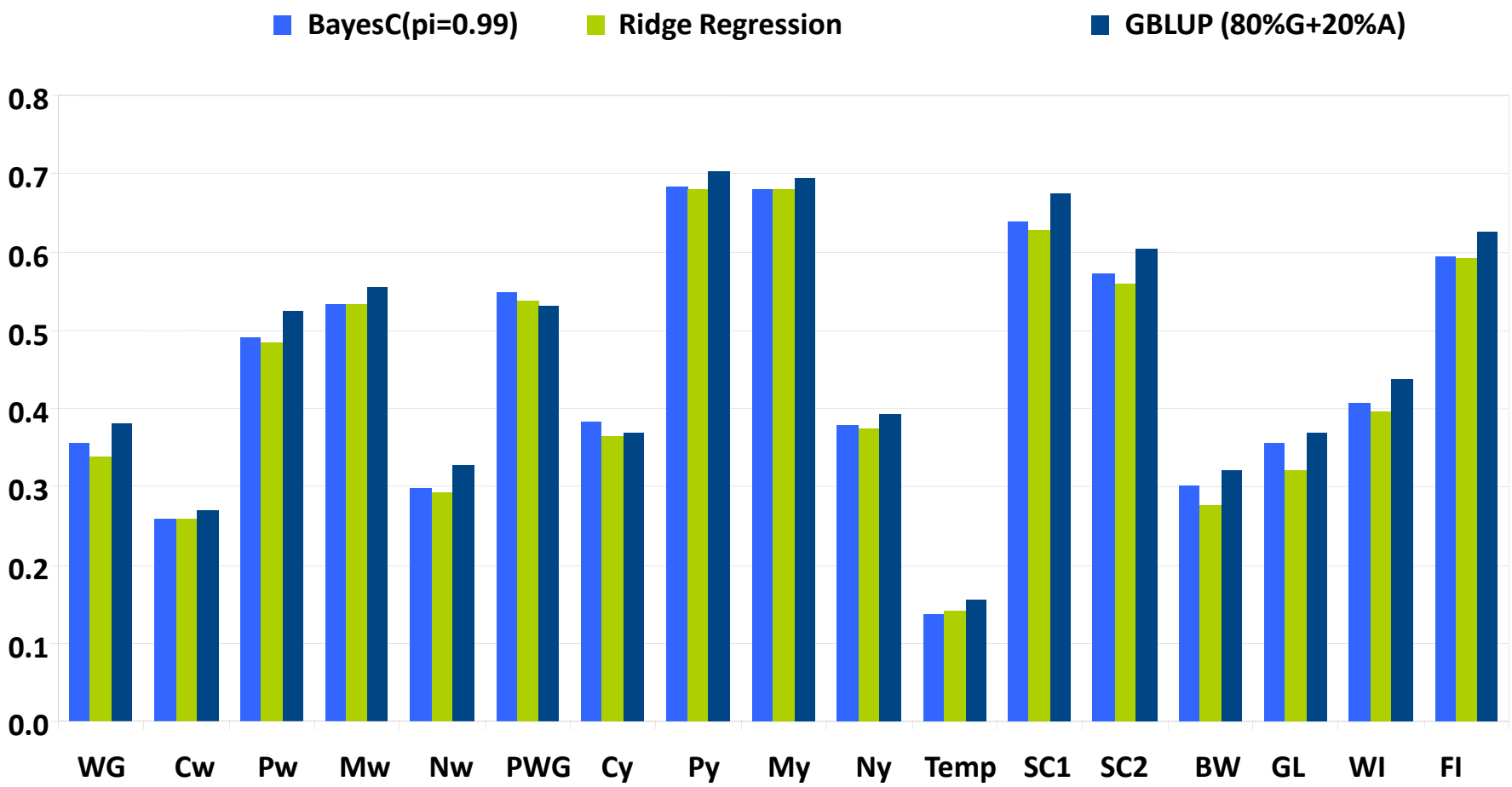
Sires without proofs in 2007 but with proofs in Nelore Aliance 2011

~ 190 sires (30%)

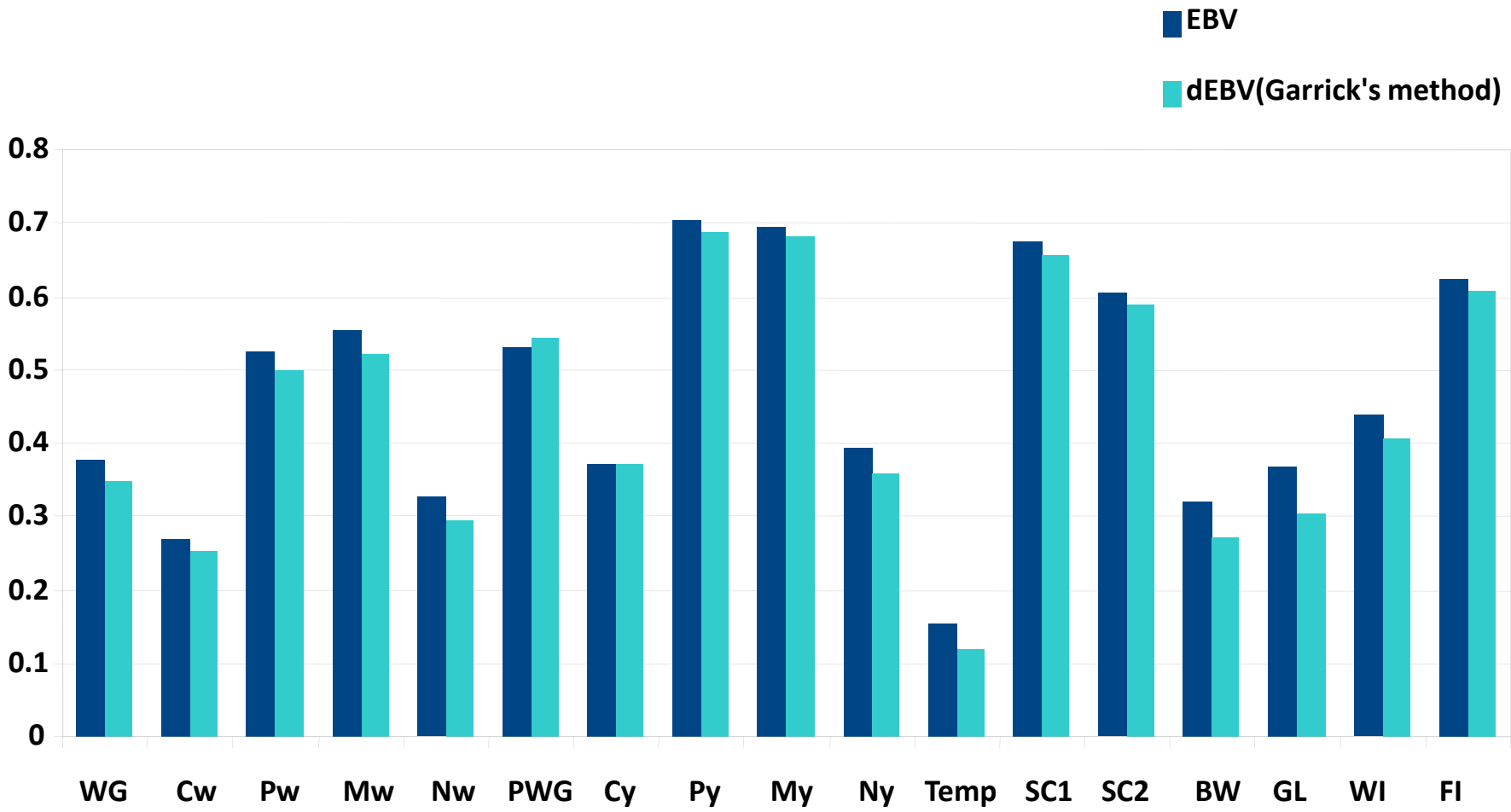
Predictive ability GBLUP



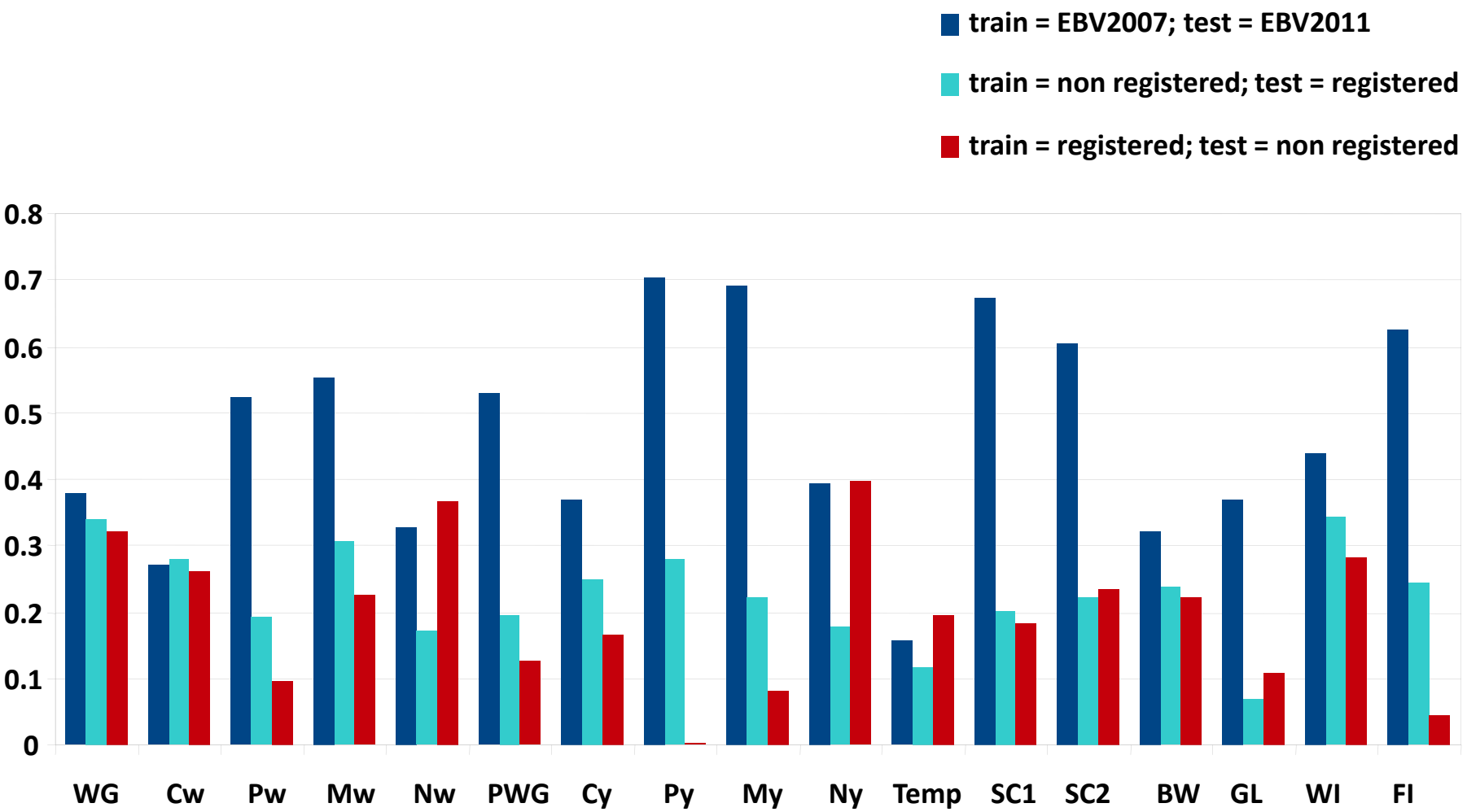
Predictive ability different methods



Predictive ability different pseudo-phenotypes (GBLUP)



Predictive ability Nelore “subgroups” (GBLUP)



Summary

- ✓ **Reasonable predictive ability** (encouraging further studies)
- ✓ **Almost no difference between GS methods**
- ✓ **Similar predictive ability with different pseudo-phenotypes**
- ✓ **Good prediction equation for the Nelore breed need to consider animals from different "subgroups"**

Acknowledgements

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