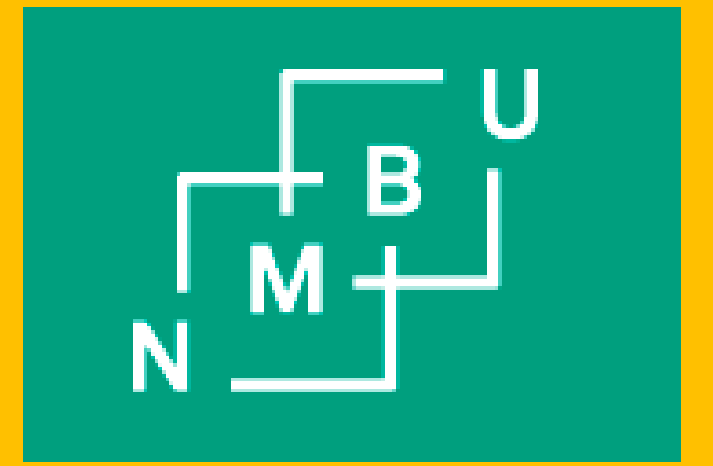




Genomic selection: application in the Spanish Arab horse breeding program



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Objectives: Development of genomic selection (GS) methods under simulation to apply GS in breeding programs.

Why Genomic Selection (GS)?

- ✓ GS allows selecting individuals in an early stage and in traits difficult to be measured.
- ✓ GS helps to increase the accuracy in the selection.
- ✓ GS maximizes the genetic progress in all livestock breeds.

Why horses?

- ✓ Long generation interval.
- ✓ Suboptimal selection intensities.
- ✓ Low heritable functional traits.

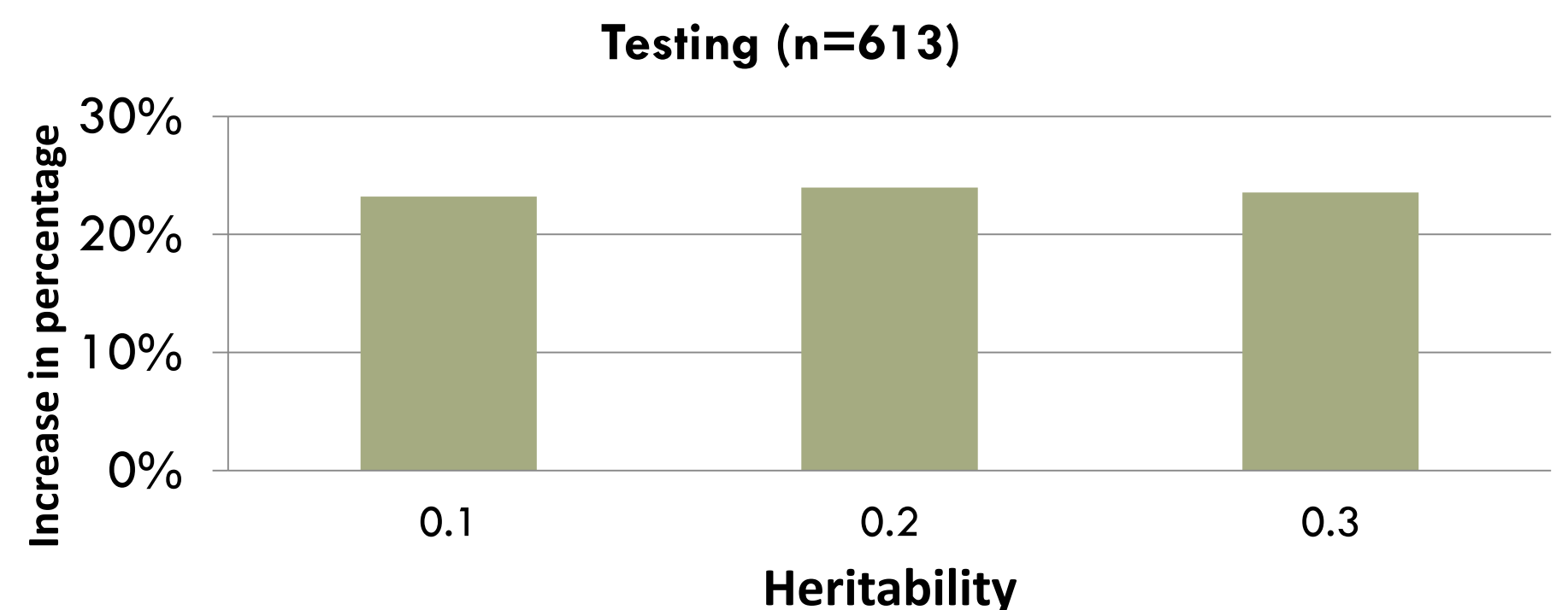
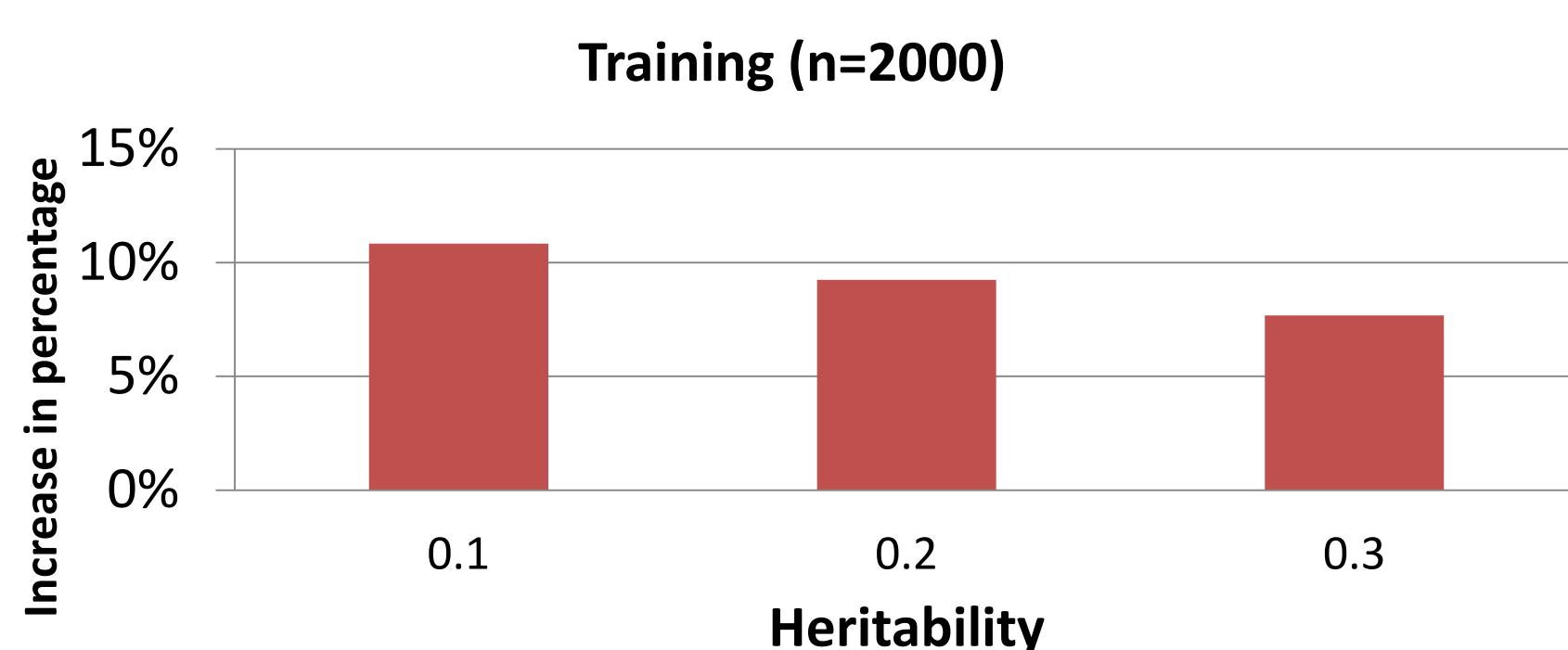
Simulated data:

- ✓ Thirty-two chromosomes.
- ✓ Mutation rate= 2×10^{-9} .
- ✓ An average of 83000 SNPs markers, MAF=0.03.
- ✓ Probability to become a QTL =3.7%.
- ✓ Historical population: $N_e=200$ and 2000 generations.

- ✓ Founders of a subset of the Real pedigree of Arab Horse.
- ✓ A simulated genotype for each animal included in the pedigree.
- ✓ Simulated breeding values and phenotypes.

Results:

Increase in accuracy using Genomic Selection vs Traditional genetic evaluation



The application of genomic selection could help preselecting young males before being castrated increasing the selection intensity and therefore the genetic response.

Future collaboration:

- The experience at NMBU has been very successful:
- ✓ Joint publications.
 - ✓ Joint communications to International Conferences.
 - ✓ Distance collaboration.
 - ✓ NMBU doors are open to come back.



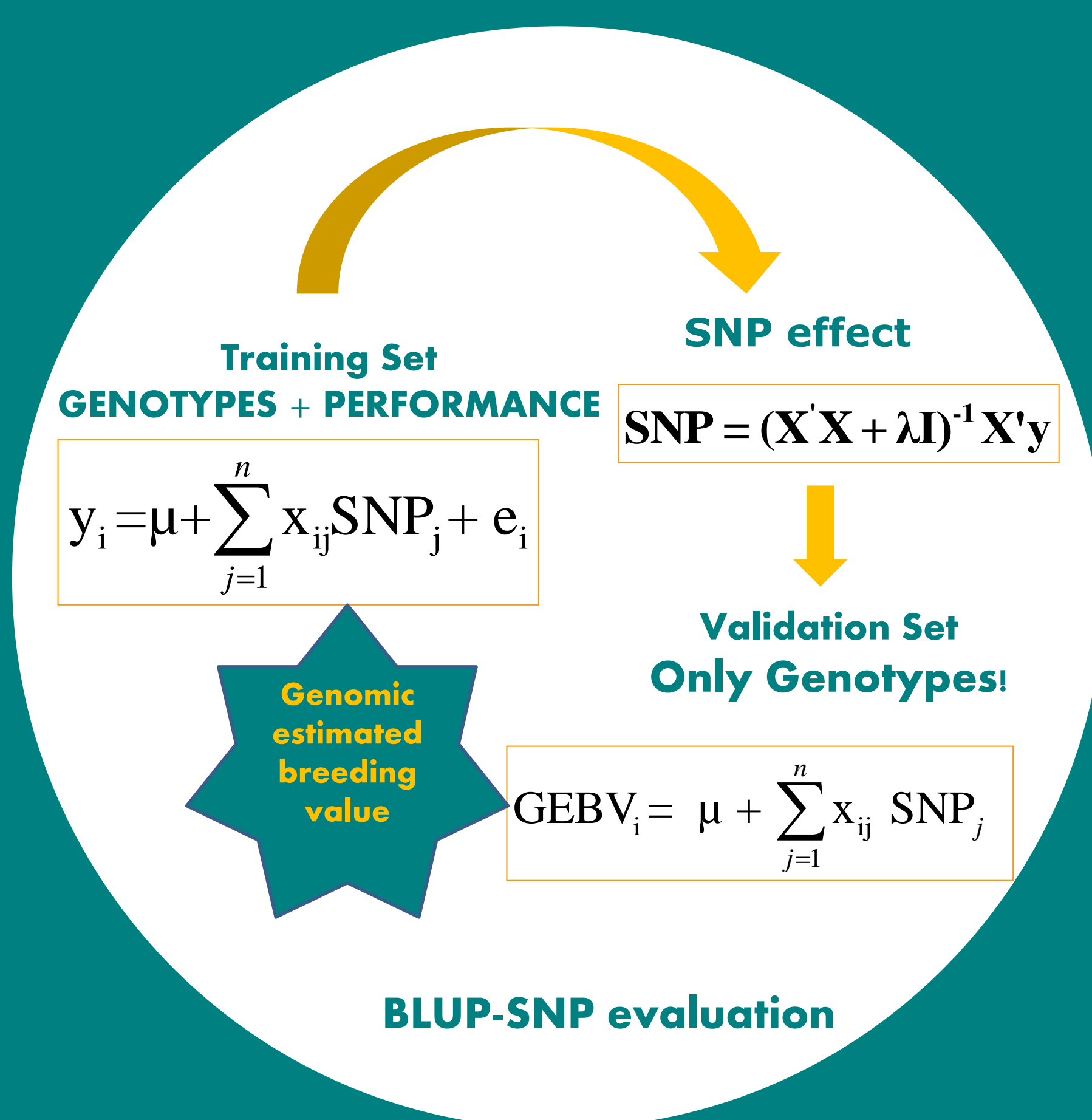
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"Punto", Spanish Arab Horse. Photo: MERAGEM group.



GS could help