



A single-step genomic evaluation of maturing rate index in French beef breeds



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INTRODUCTION

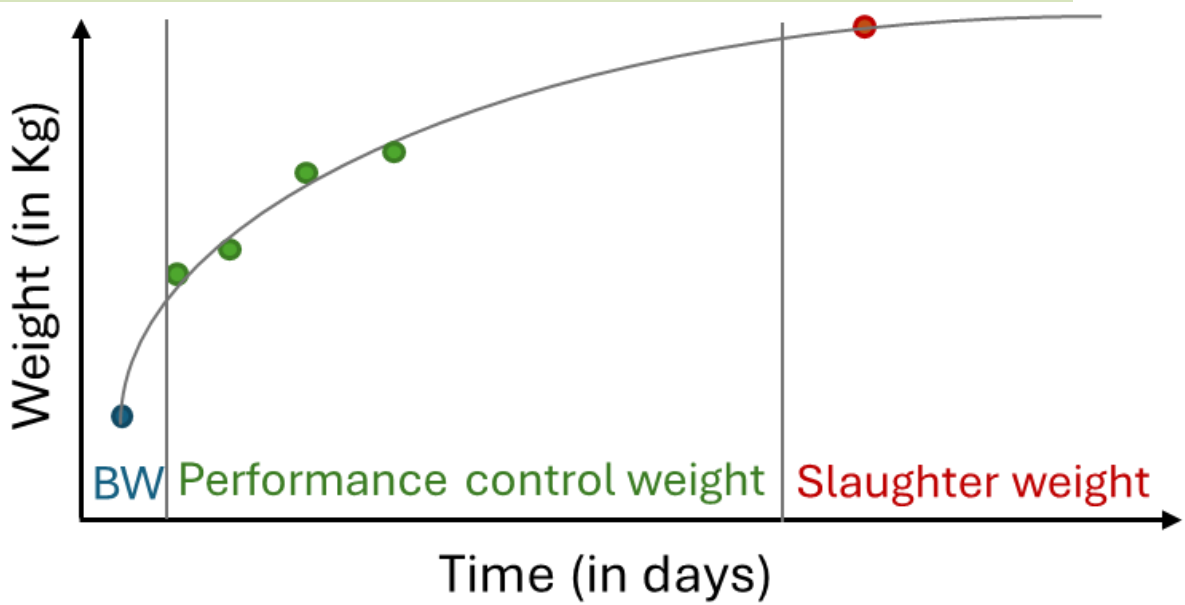
Particularity of the maturing rate index:

- This traits is interesting to :
 - Maximise early beef production
 - Reduce fattening time and added concentrates
 - Reduce the environmental impact of finished products
 - Facilitate 2-year-old calving through early development
- Moderate heritability of 0.24 and genetic variability of 9%
- Estimated phenotype after slaughter (at least 4 years old)

Genomic selection on the maturing rate index is essential

MATERIALS AND METHODS

Performance of maturing rate index : Estimated on adult females of 5 beef breeds using individuals weighings and the Brody equation.



Brody equation:

$$Weight(time) = Weight_{adult} - (Weight_{adult} - Weight_{birth})e^{-maturing\ rate\ index * time}$$

Genomic evaluation:

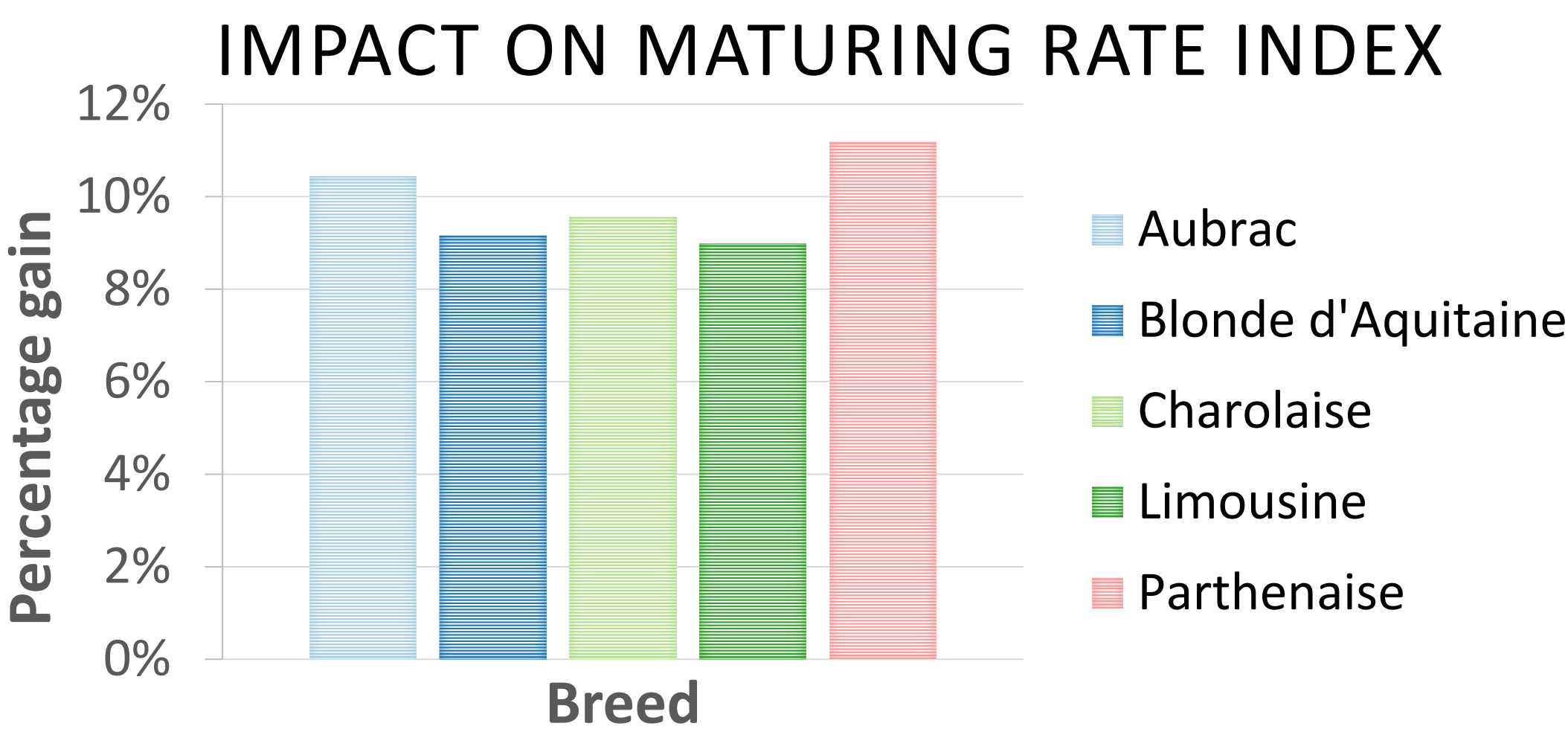
- Univariate Single-Step model with HSSGBLUP software
- 7 fixed effects related to birth and slaughter + age at slaughter as a covariate.

RESULTS AND DISCUSSION

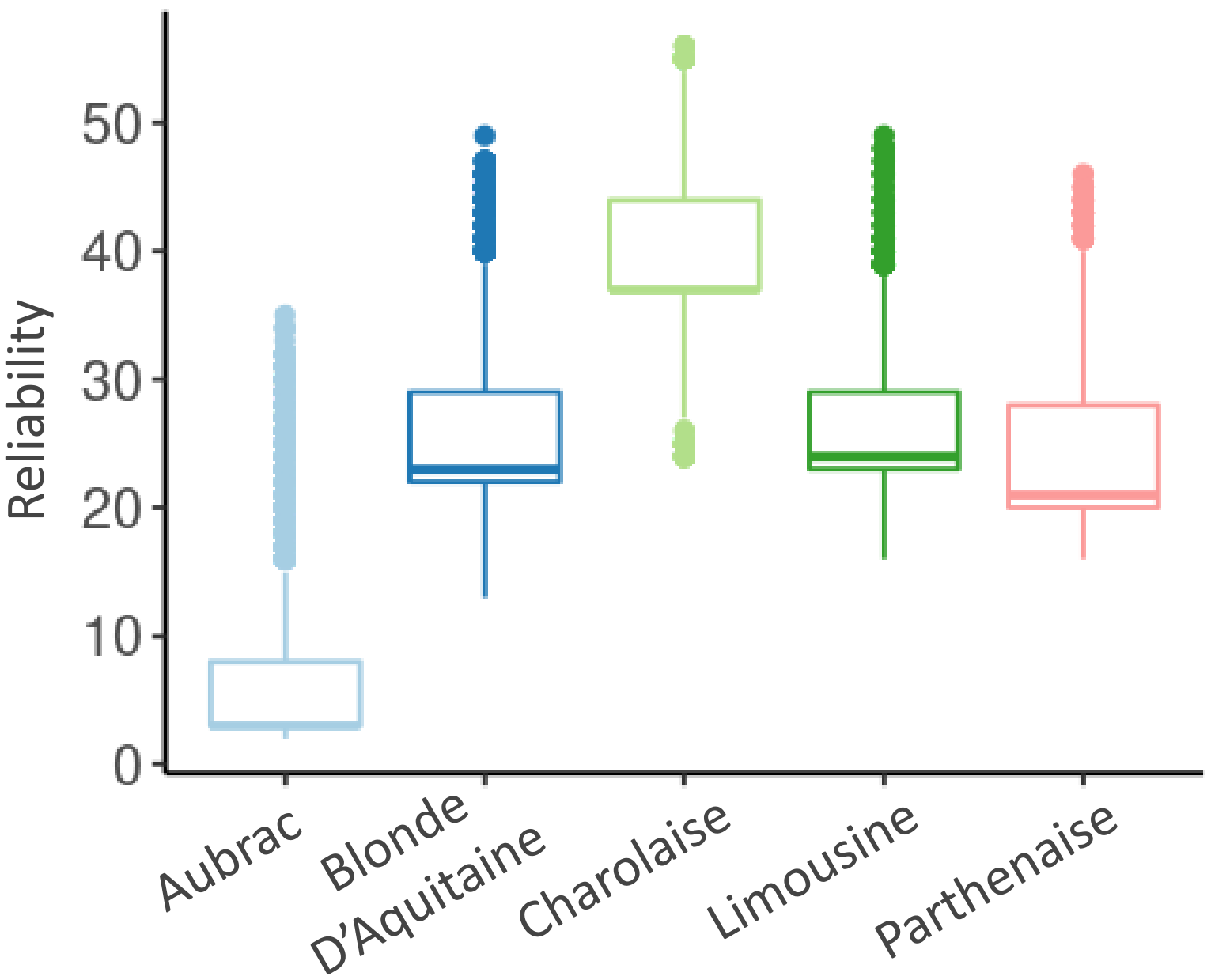
Number of animals used in genomic evaluation

Breed	Animals in pedigree	Animals phenotyped	Reference population
Aubrac	23,155	7,269	414
Blonde d'Aquitaine	171,204	93,718	3,856
Charolaise	811,536	460,627	7,360
Limousine	449,507	270,417	2,179
Parthenaise	61,851	38,929	1,060

Impact of a +1 standard deviation selection on performance



Reliability of GEBVs of genotyped candidates in each breeds:

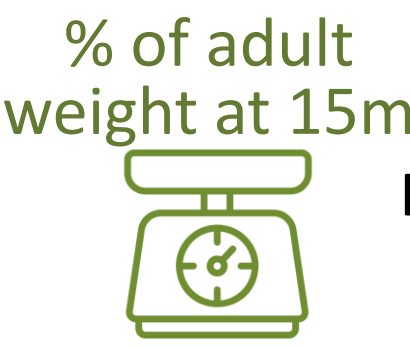


This impact is equivalent to :



an average gain of -1.3 months to reach 50% of the adult weight across all breeds (-1 to -1.7 month)

OR



an average gain of 3.2% of the adult weight reached at the age of 15 months across all breeds (+3% to +3.5 %)

BUT ALSO



an average loss of -40.6 kg of the adult weight across all breeds (-35 kg to -50.7kg)

CONCLUSION

- Selecting on the maturing rate index is of interest for the productivity and profitability of the cattle beef farm
- A genomic evaluation is important to select as early as possible
- Evaluation requires regular genotyping of females to improve the reliability of GEBVs

Many thanks to the 6 breed societies who participated.

