

Mating strategy base on DNA parentage information in an Italian chicken breed

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AIM

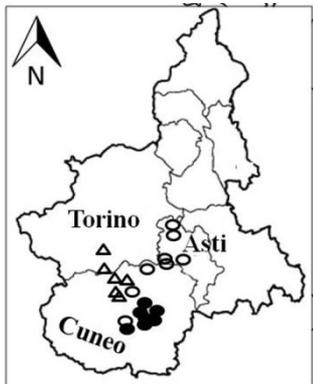
In this study we assessed the effect on **progeny inbreeding and growth traits** of a **mating scheme base on genetic parentage information** in local chicken breeds



Bionda Piemontese



- slow growing chicken breed
- traditional Italian breed (Piedmont)
- included in a poultry biodiversity conservation national project named TUBAVI
- reared mainly for egg and meat production (Cappone di Morozzo o Cappone di San Damiano)



Local chicken breeds

- vary small populations
- Little livestock farms
- breeders exchange are limited
- Phenotype selection

Kinship/ Coancestry

reproductive and
productive
performance decline

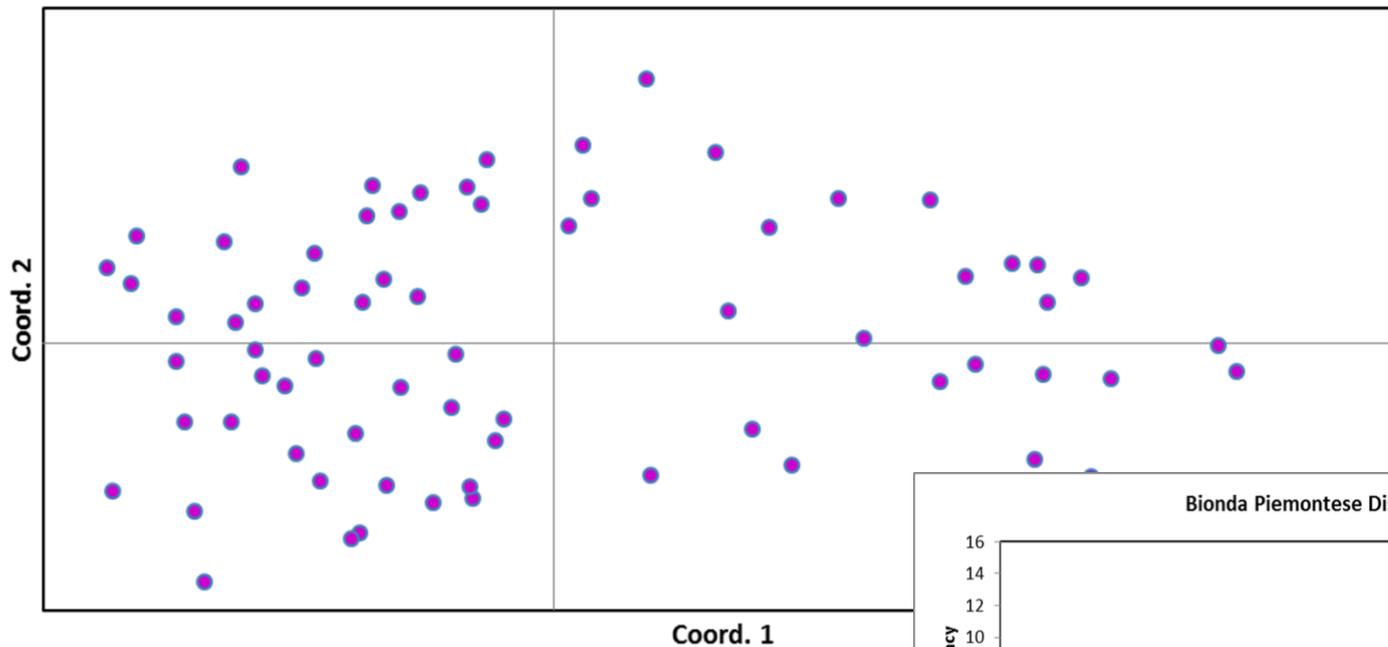
- Loss of **genetic variability**
- increase of **individual homozygosity**

How to minimize progeny inbreeding in local population?

- * Select breeders for their variability contribution
- * outbreeding mating scheme (pedigree)
- * Optimum Contribution (OC) method

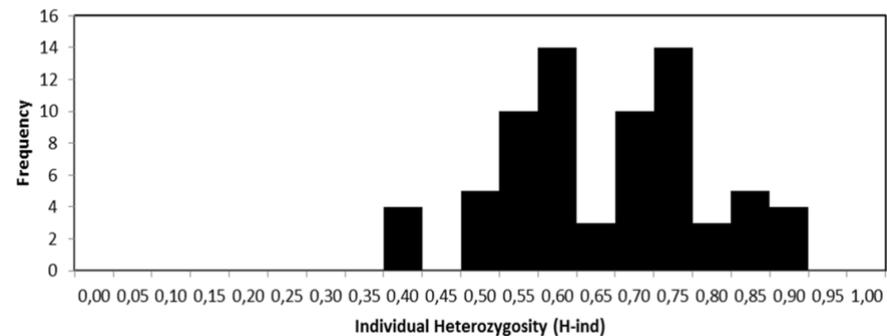
DNA Microsatellite

Principal Coordinates (PCoA)



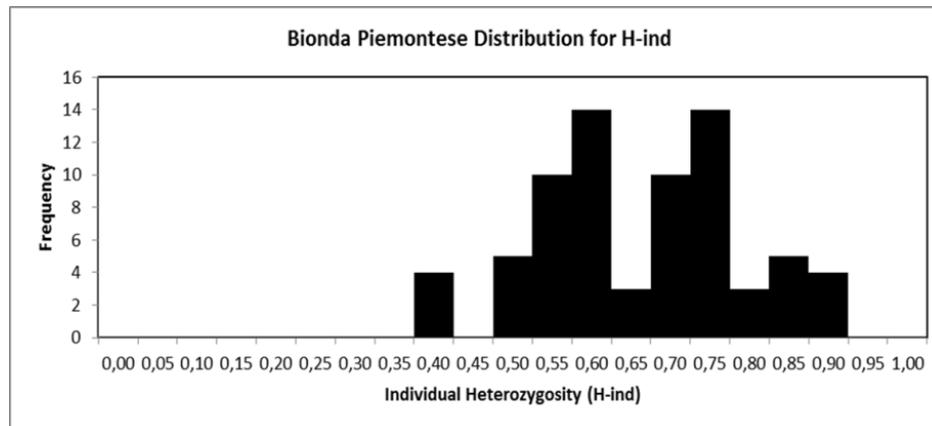
Molecular coancestry base on **proportion of shared alleles (DPS)**

Bionda Piemontese Distribution for H-ind



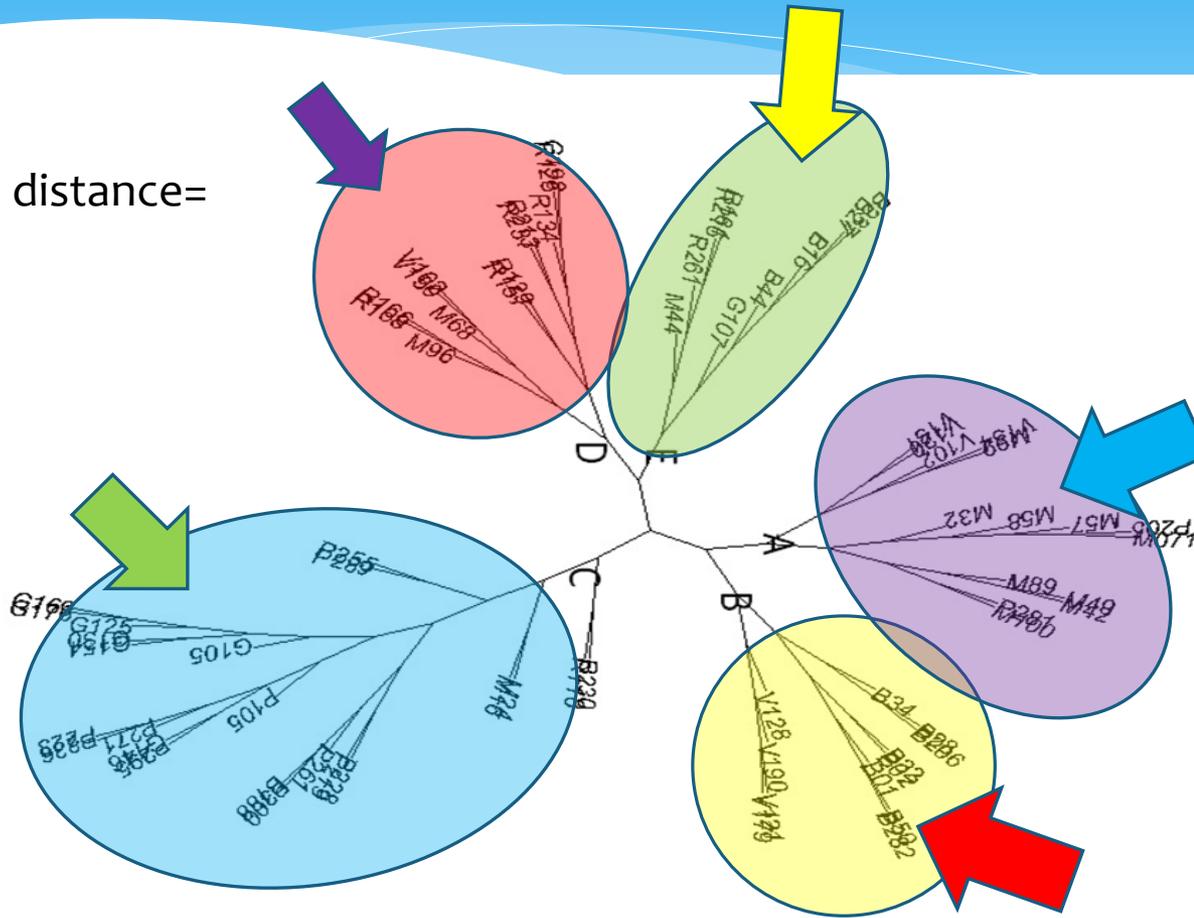
Selected breeders for their variability contribution

Breeders were selected for individual heterozygosity (H-ind) to preserve highest number of alleles



Outbreeding mating scheme

Genetic distance=
DPS



S1=yellow
S2=green
S3=blue
S4=red
S5=purple

Optimal Contribution (OC) method

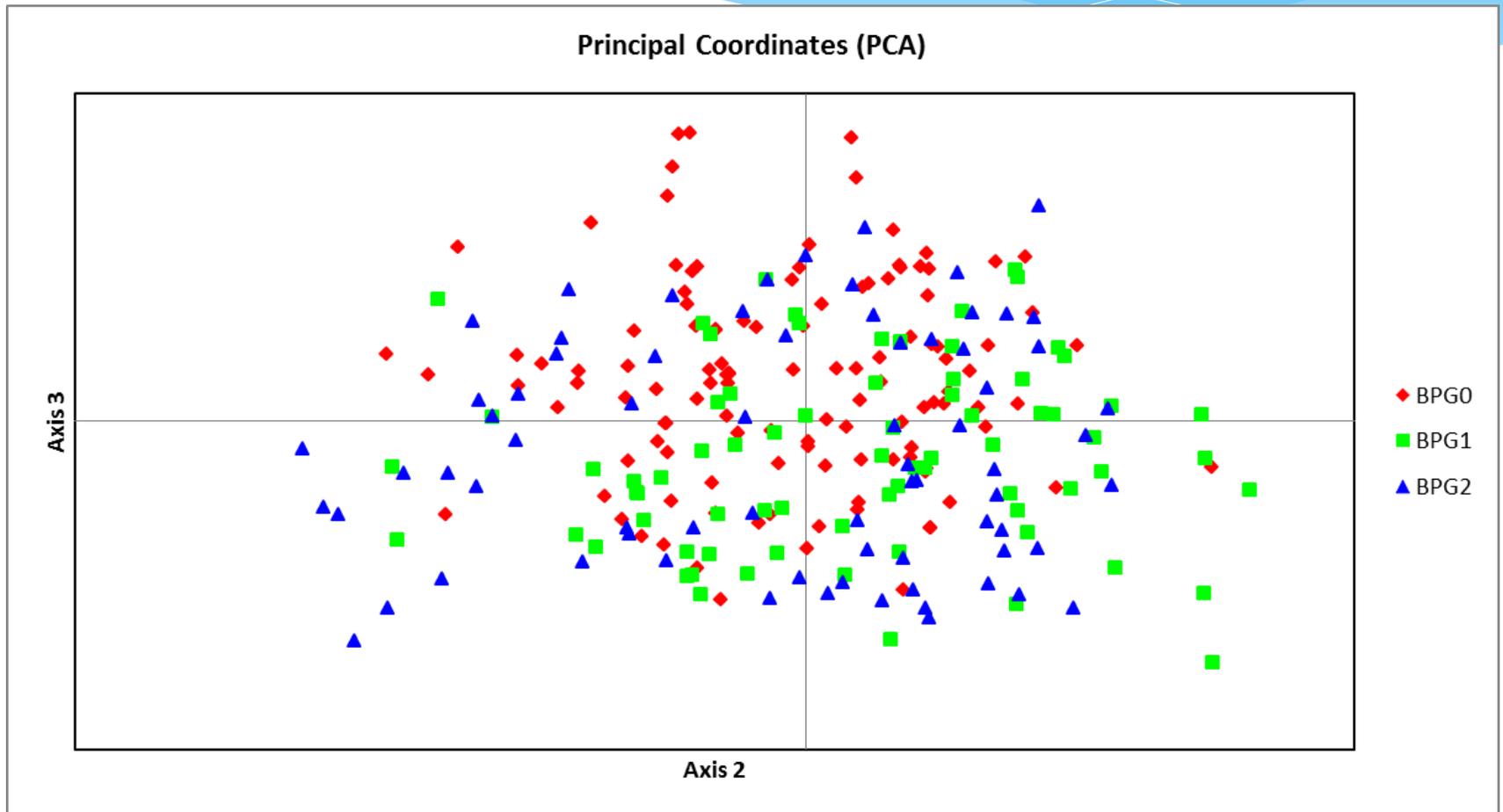


Offspring:
10 hens 1 cock for family
Male rotated mating
scheme

Results

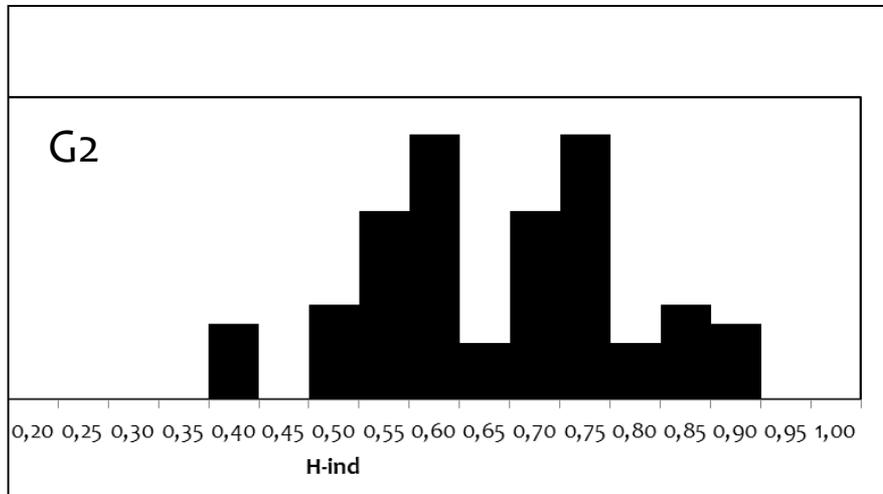
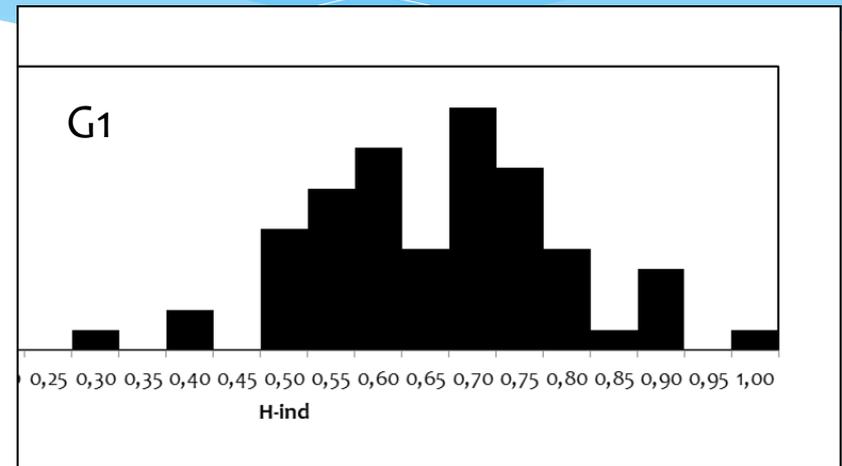
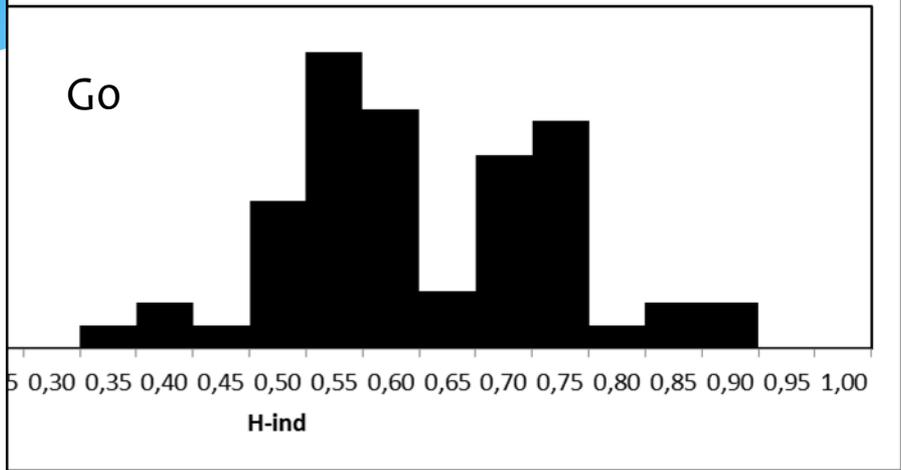


GENETIC VARIABILITY PRESERVED



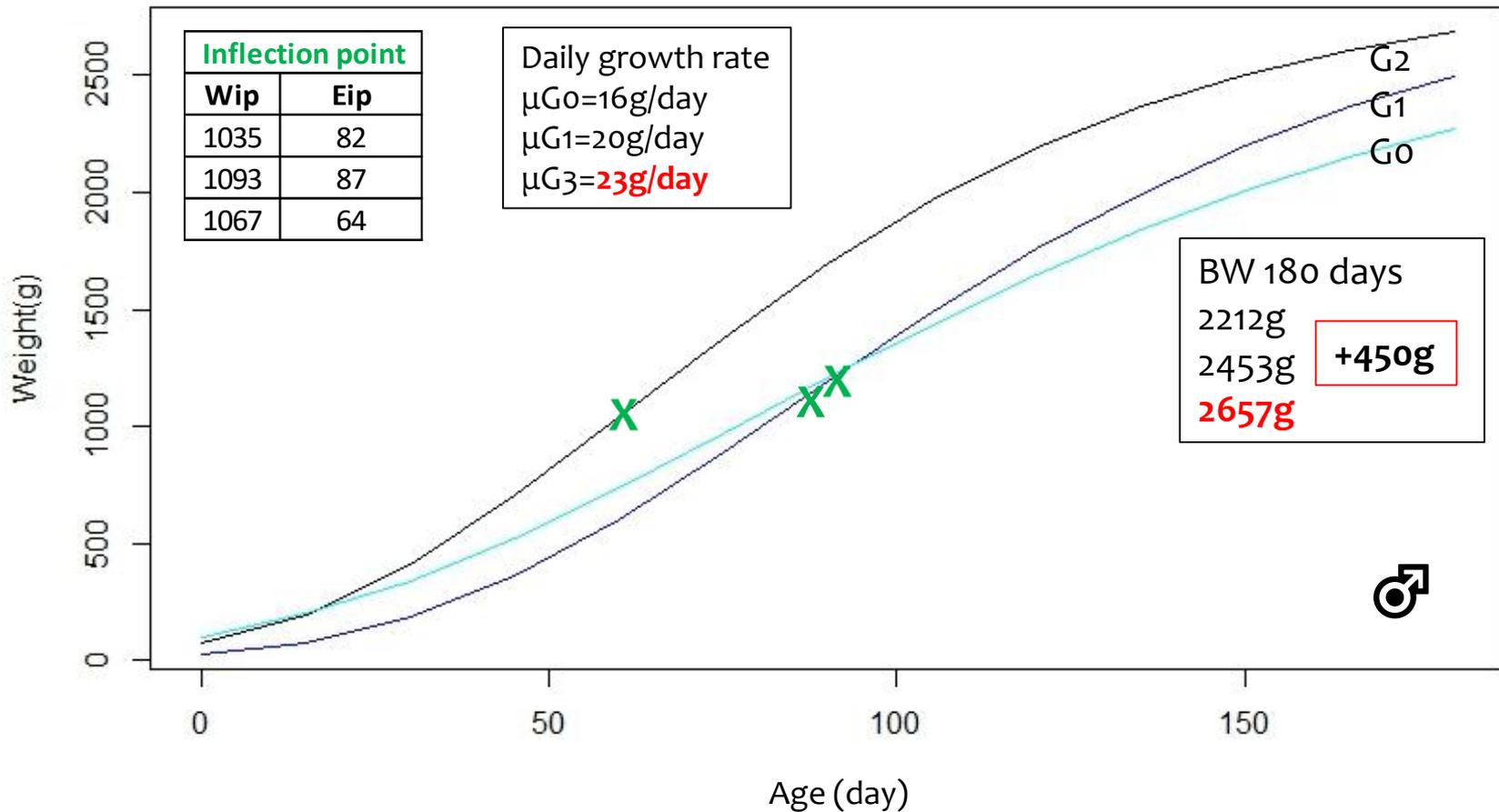
Individual heterozygosity Increased

Frequency Distribution for H-ind

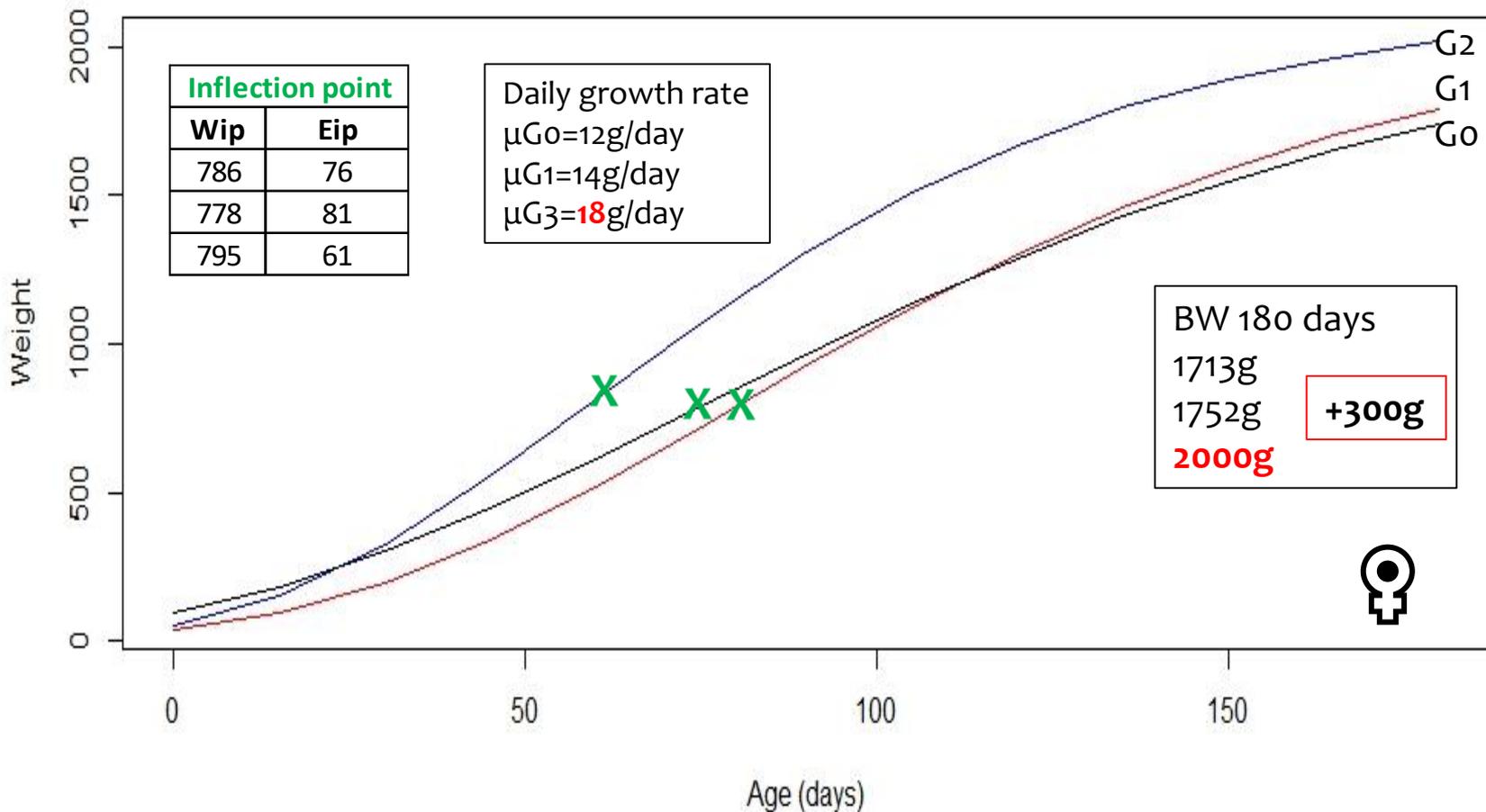


	BPG0	BPG1	BPG2
Mean	0,651	0,640	0,688
Median	0,643	0,640	0,703
SD	0,126	0,164	0,129
SE	0,012	0,019	0,015
Min	0,357	0,300	0,429
Max	0,929	1,000	0,929

Growth performance ...



... improved



Conclusions

- * Genetic variability preserved
- * Offspring heterozygosity increasing
- * Growth performance improved

The use of molecular parentage in mating schemes could be a reliable tool for the management of small size chicken populations and to improve their production.

Thank you for your
attention!!!



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