

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

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DEGLI STUDI  
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# AIM

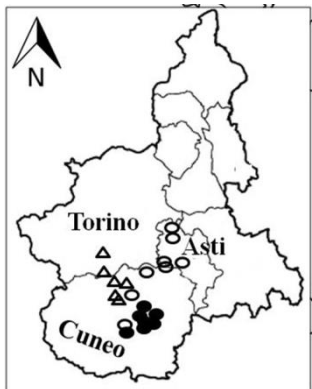
In this study we assessed the effect on **progeny inbreeding and growth traits** of a **mating scheme base on genetic parentage information** in local chicken breeds



# 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)



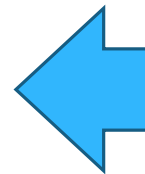
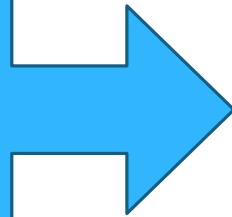
# Local chicken breeds

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

**Kinship/ Coancestry**

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

**reproductive and  
productive  
performance decline**

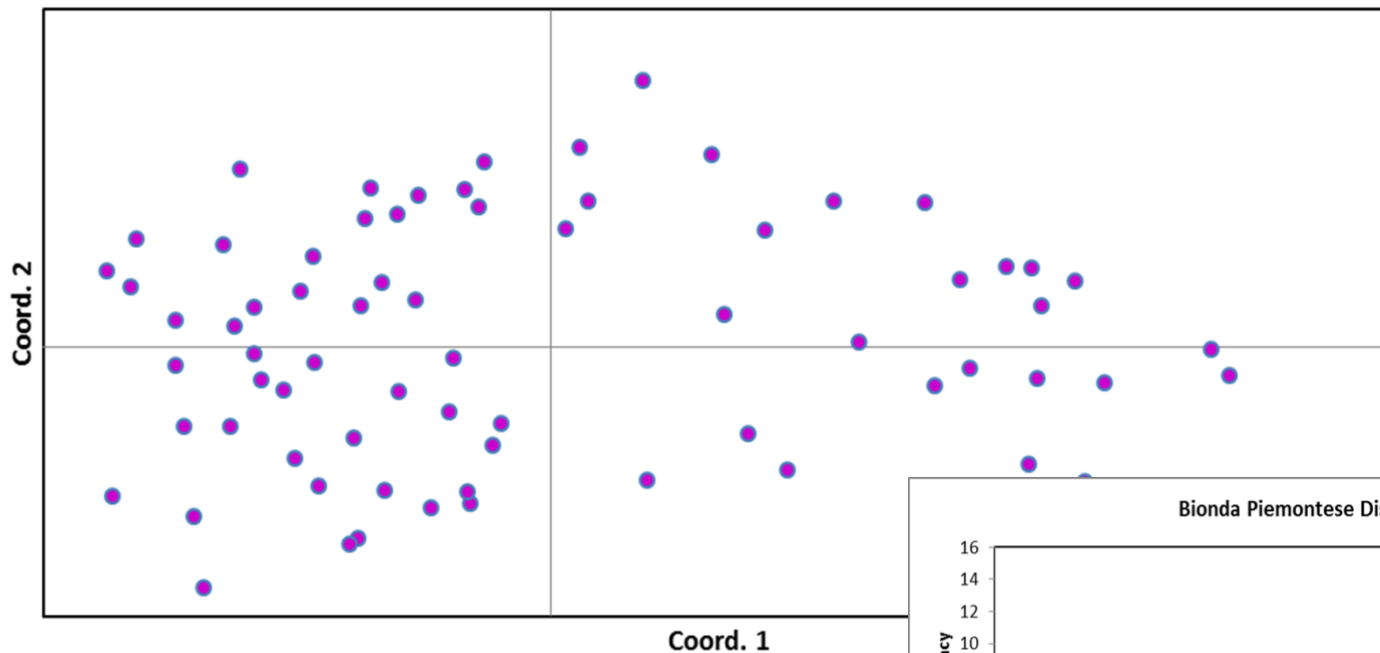


# How to minimize progeny inbreeding in local population?

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

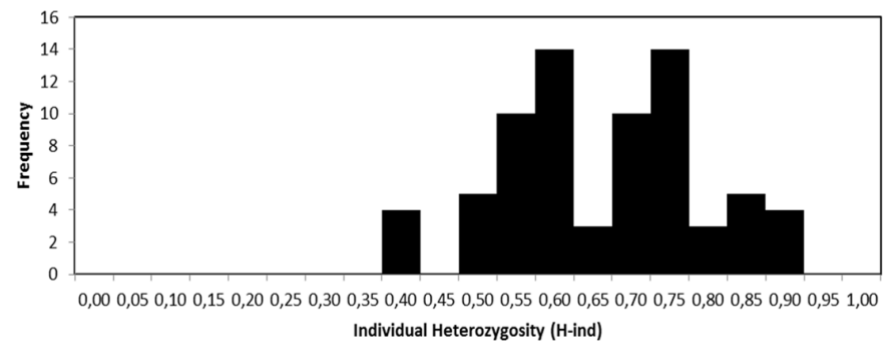
# DNA Microsatellite

Principal Coordinates (PCoA)



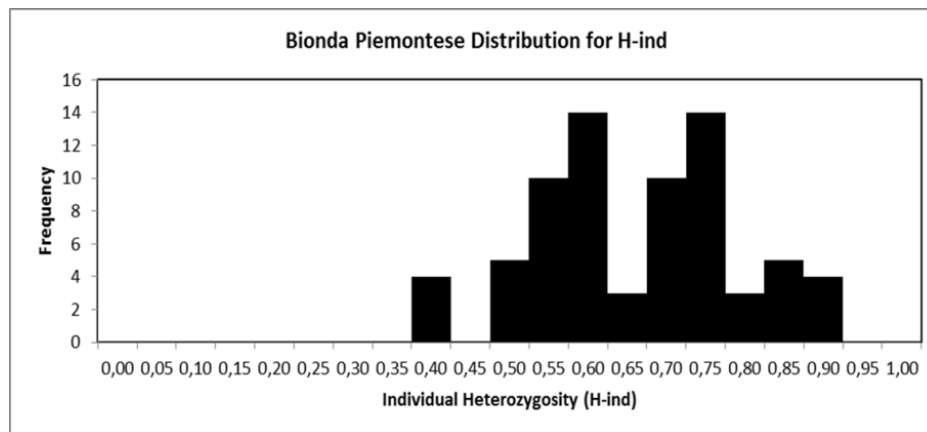
Molecular coancestry base on **proportion of shared alleles** (DPS)

Bionda Piemontese Distribution for H-ind



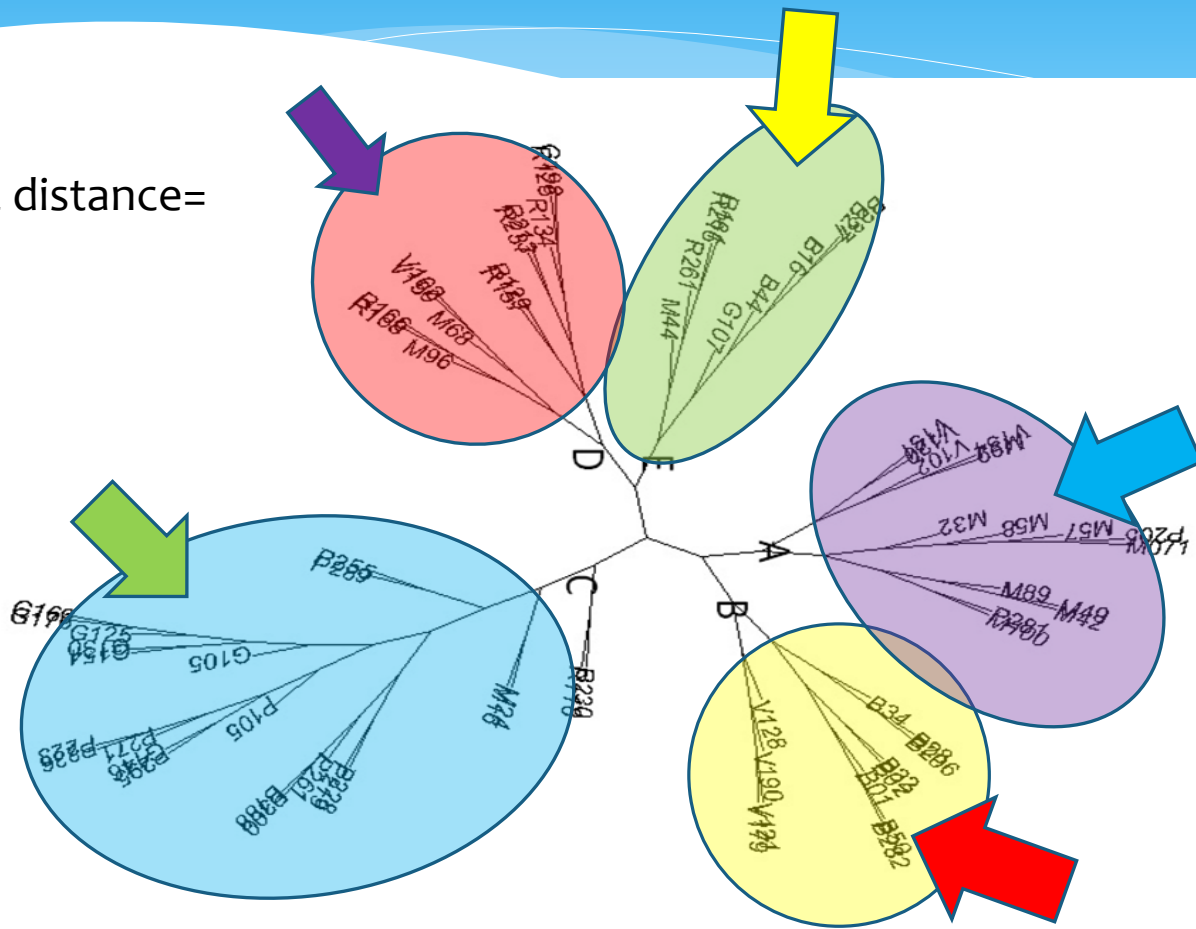
# Selected breeders for their variability contribution

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

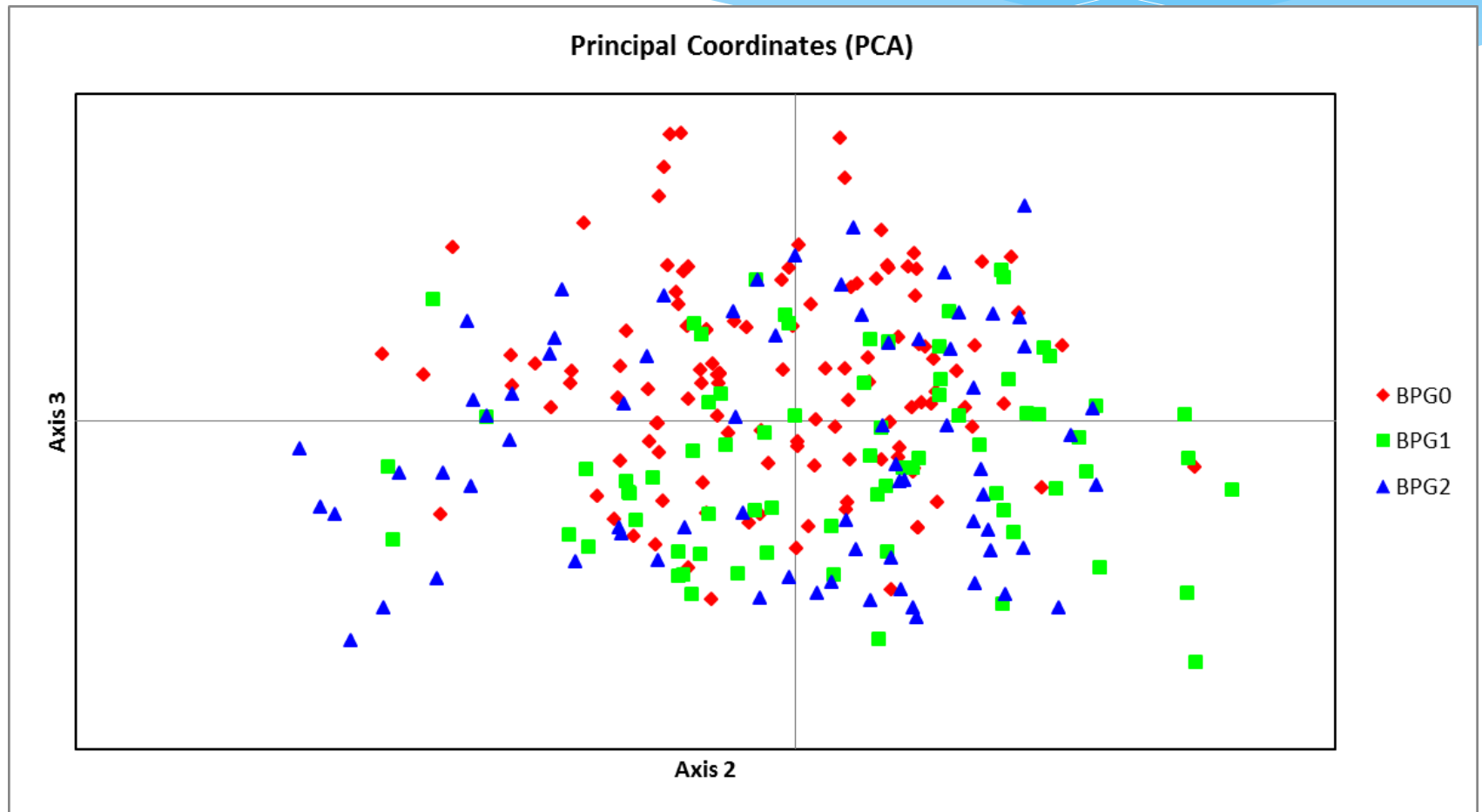


Offspring:  
10 hens 1 cock for family  
Male rotated mating  
scheme

# Results

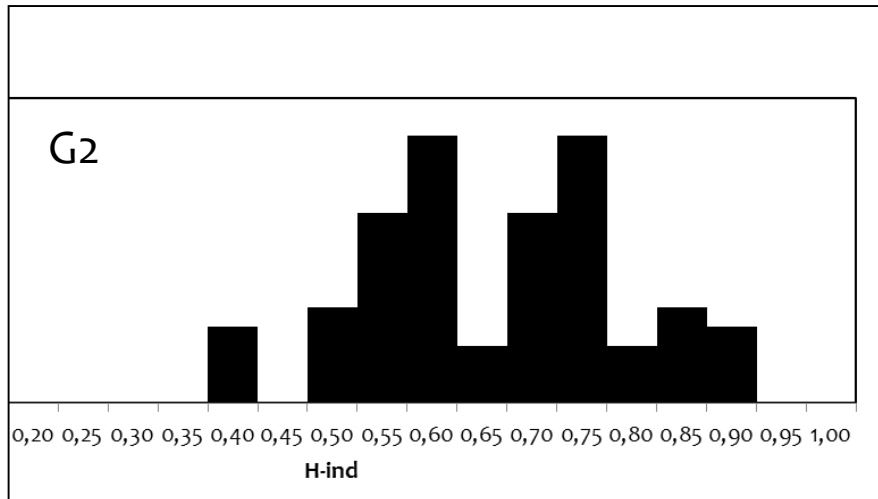
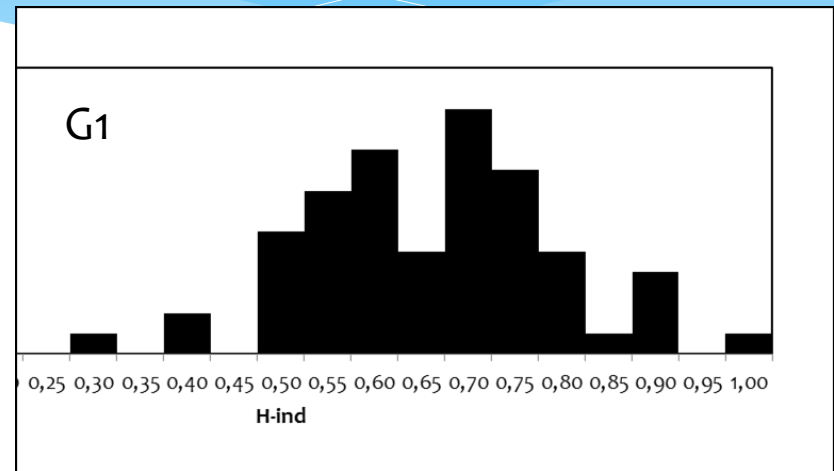
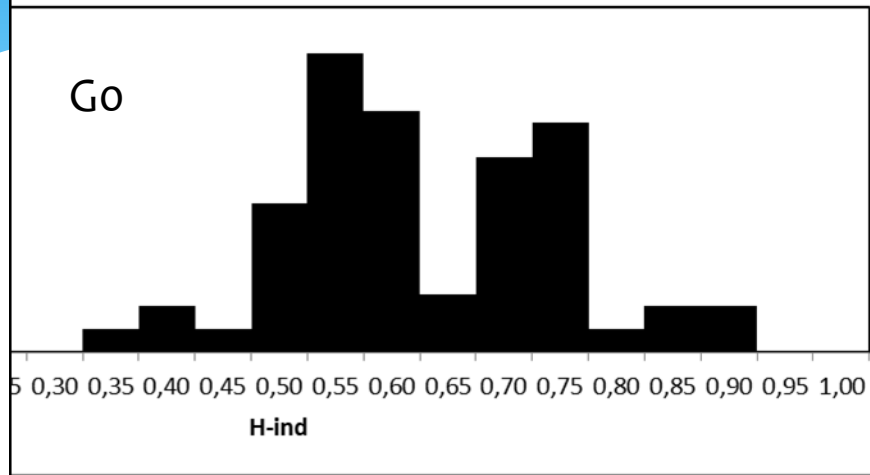


# GENETIC VARIABILITY PRESERVED



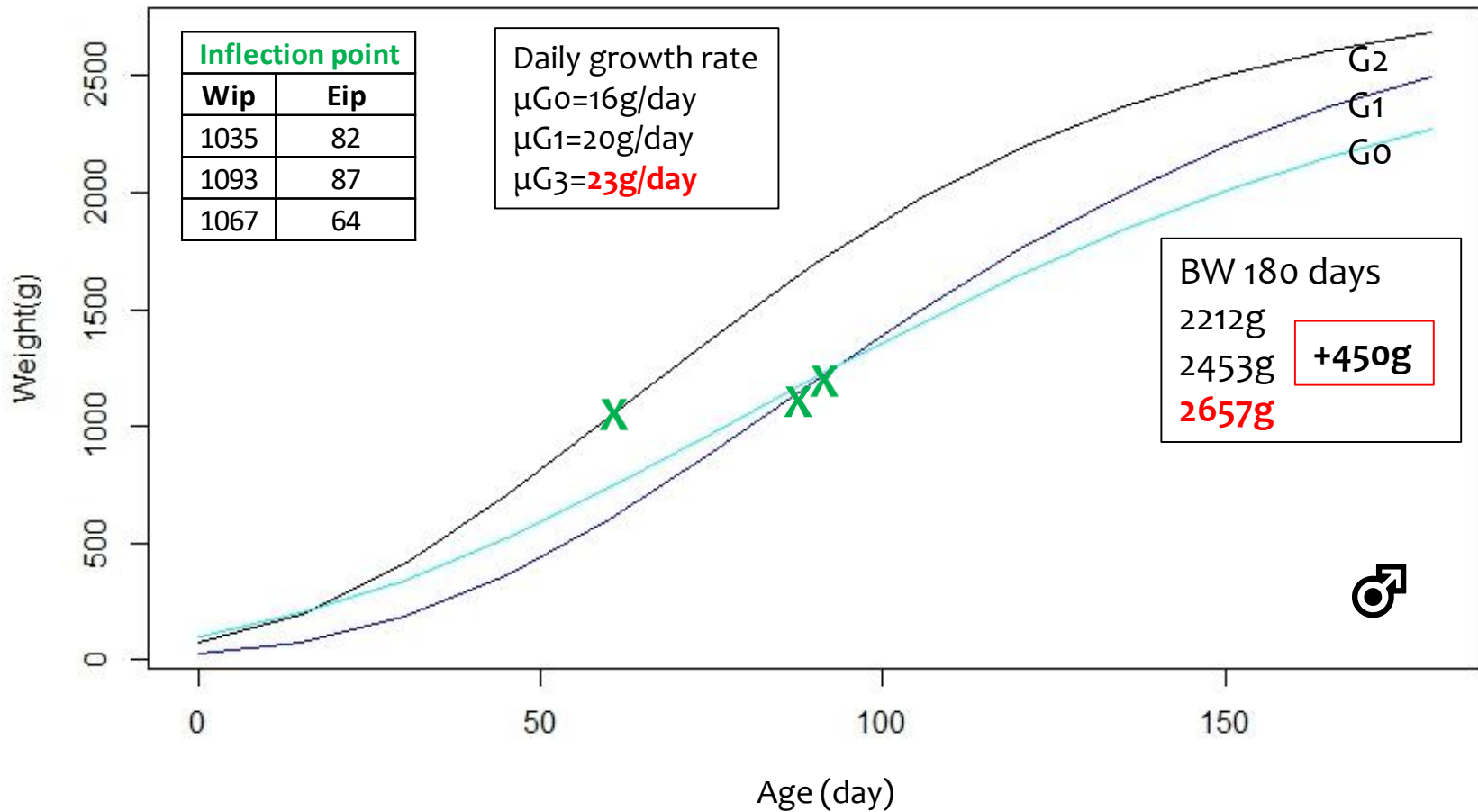
# Individual heterozygosity Increased

Frequency Distribution for H-ind

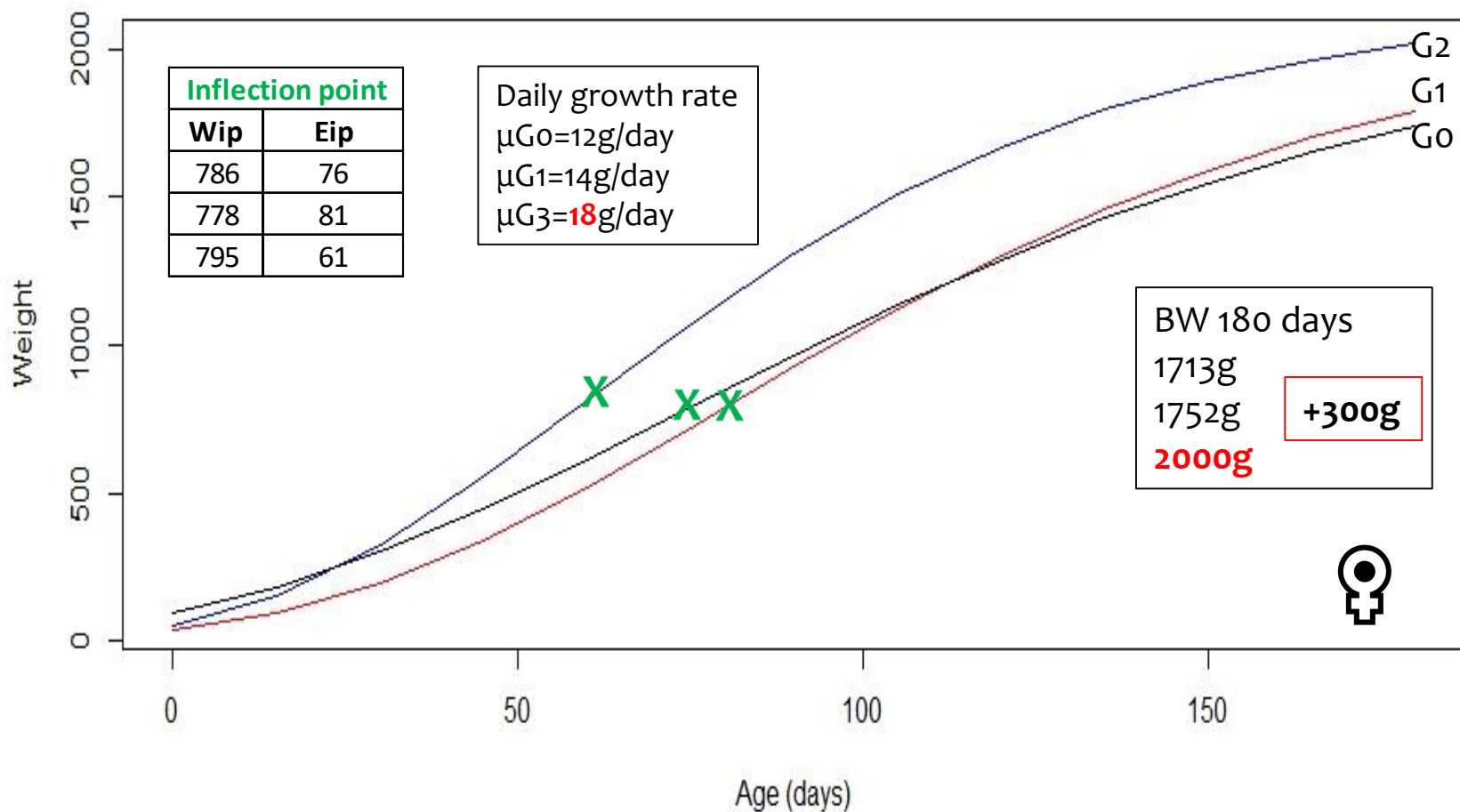


	BPG0	BPG1	BPG2
Mean	0,651	0,640	0,688
Median	0,643	0,640	0,703
SD	0,126	0,164	0,129
SE	0,012	0,019	0,015
Min	0,357	0,300	0,429
Max	0,929	1,000	0,929

# 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!!!



FONDO EUROPEO AGRICOLO  
PER LO SVILUPPO RURALE:  
*l'Europa investe nelle zone rurali*

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