

Genetic relationships between litter size and performance traits in two French pig breeds

Thierry Tribout , Jean-Pierre Bidanel

INRA, UR337 – SGQA, 78352 Jouy-en-Josas, France

Relationships between litter size and performance traits

Prolificacy and performance traits are usually considered as genetically independent in pigs. However, decades of selection for increased growth rate, carcass leanness and litter size may have changed genetic relationships between the two groups of traits, particularly for young females

Objectives

Estimate genetic correlations of on-farm performance traits with litter size in the two major French dam populations, i.e. Large White (LW) and Landrace (LR) breeds)



Material and methods

● **Traits :** Age (A100) and average backfat thickness (ABT) at 100 kg , number born alive (NBA) on parity 1-3, treated as different traits

● **On-farm data** collected between 1997 and 2006 in the largest nucleus herds.

	LR	LW
A100, ABT	194,270	254,934
NBA1	22,364	33,377

● **Analyses:** REML methodology applied to multiple trait animal models (VCE software)

- Fixed effect : contemporary group
- Random effects : birth litter (A100, ABT), litter sire (NBA), additive genetic value
- covariate (age at farrowing)

Results

● Parity 2 and 3 are genetically very close $rg = 0.94$ (LR) and 0.95 (LW)

● Parity 1 litters differ from later parities $rg = 0.69$ to 0.74 (s.e. 0.02)

● Antagonistic genetic relationships between litter size and performance traits, which do not decrease over parities

	A100	ABT
NBA1 LR	0.28	0.09
LW	0.31	0.09
NBA2 LR	0.32	0.12
LW	0.31	0.13
NBA3 LR	0.31	0.16
LW	0.28	0.20

Conclusion

- Litter size and performance traits cannot be considered as genetically independent
- The impact of these results on selection objectives and genetic evaluation, as well the genetic and physiological basis of this antagonism, should be investigated