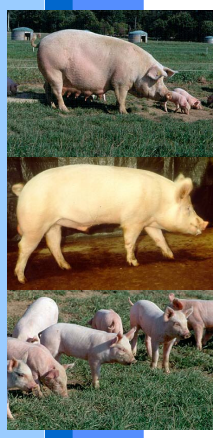
Genetic parameters and genetic trends for litter size and pre-weaning mortality in French Landrace and Large White pigs



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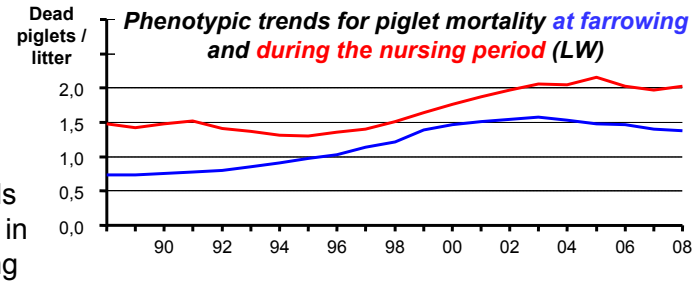
Selection for sow prolificacy has been very successful !

Litter size at birth has been increased by more than 30% since the beginning of the 90'. Yet, this increase has been accompanied by some deterioration of piglets' viability at farrowing and during the nursing period.



Objectives

Estimate genetic parameters and genetic trends for litter size and piglet mortality up to weaning in order to investigate the possibilities of improving both litter size and piglet survival.

Material and methods

- **Traits:** Number of piglets born in total (NBT), born alive (NBA), weaned from a sow (NW), nursed by a sow (NN), dead piglets at farrowing (NDF) and during nursing (NDN).

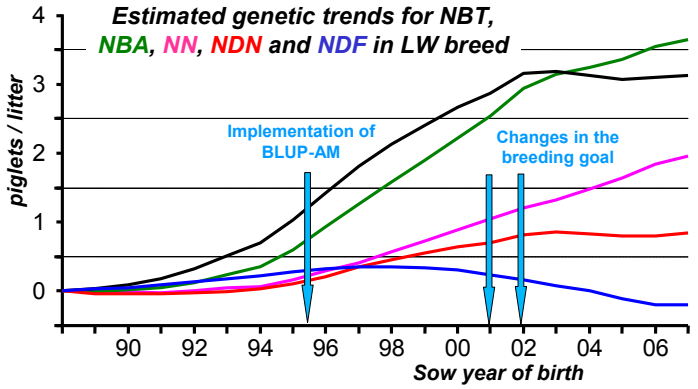
On-farm data collected between 1988 and 2008 in French Landrace (LR) and Large White (LW) selection and multiplication herds.

	LR	LW
Litters	462,200	820,798

- **Analyses:** REML & BLUP methodology applied to multiple trait animal models
  - Fixed effect : parity, herd x year x season, type of mating, genetic type of sire
  - Random effects : litter sire, additive genetic value, sow permanent environment
  - Covariate: age at farrowing within parity

Results

- genetic correlations (r_G):
  - NDN - unfavourable r_G with NBA (LW: 0.51; LR: 0.53)
  - NDN - favourable r_G with NN (LW: -0.32; LR: -0.17)
  - NDN - low unfavourable r_G with NW (LW: 0.05; LR: 0.09)
  - NDF - low unfavourable r_G with NBA in LR (0.10)
  - NDF - favourable r_G with NN in LW (-0.34) and with NW in LW and LR (-0.23; -0.11)
- Estimated genetic trends show:
  - increase of NDF until 1999 and then improvement;
  - deterioration of NDN until 2002 and then stabilization.



Conclusion

- Selection for litter size has been efficient over the last 20 years.
- Using NBT as a selection criterion has resulted in a deterioration of piglet preweaning survival.
- Selecting on NBA has prevented from a further deterioration of farrowing survival.
- Selection for number nursed should result in an increase in piglet survival up to weaning.

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