Sveriges lantbruksuniversitet
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NORDIC GENETICS

Genetic impact of Hampshire sires on litter size and piglet survival

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Timo Serenius, Nordic Genetics

- Swedish pig production: $<4*10^6$ pigs slaughtered per year
- Commercial sows: Landrace*Yorkshire crossbreds
- Sire lines: Hampshire (65%) and Duroc (35%)
- Female fertility is included in the breeding goal for L and Y, but for H, breeding goal includes ’only’ production and conformation
- What about the paternal influence on litter size and piglet survival? 25% of all born piglets does not live until weaning!!

➢The study is based on data on purebred Hampshire, from Swedish nucleus herds, provided by the Swedish-Finnish breeding company **Nordic Genetics**

➢Data on purebred Hampshire litters, parity 1 to 4,
born in the period 2000 to 2012 in 5 Swedish nucleus herds.

➢Data on 10400 litters / 970 AI-boars /5400 sows was included in the statistical analyses.

<u>Traits analysed:</u>
Total born (TB)
Stillborn (SB)

Statistical analyses

SAS (phenotypic analyses)

DMU (genetic analyses)

Statistical model:

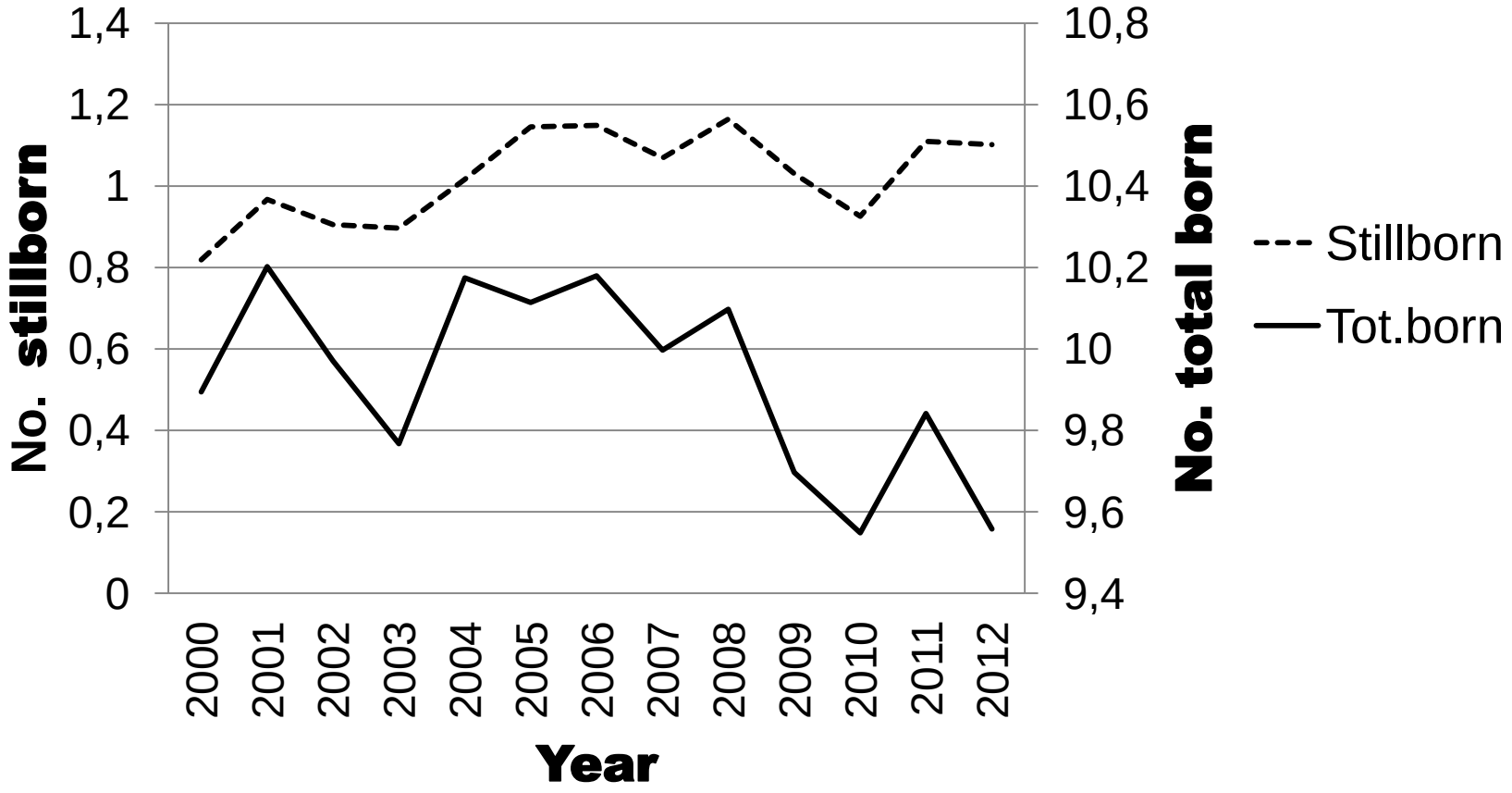
Nucleus herd (fixed)
Parity number (fixed)
Birth year of litter (fixed)
Herd-year-month-combination (random)
Sow (random)
Sire (random, genetic)

Phenotypic means

Number of pigs	Hampshire, nucleus herds	H*(L*Y), D*(L*Y) commercial herds (2011)
Total born (TB)	9.5	14.2
Stillborn (SB)	1.0	1.1
Weaned	7.8#	10.7
Preweaning mort.	0.8#	2.4 (=18.3% of liveborn)

#Not included in the genetic analyses; unknown proportion of crossfostering

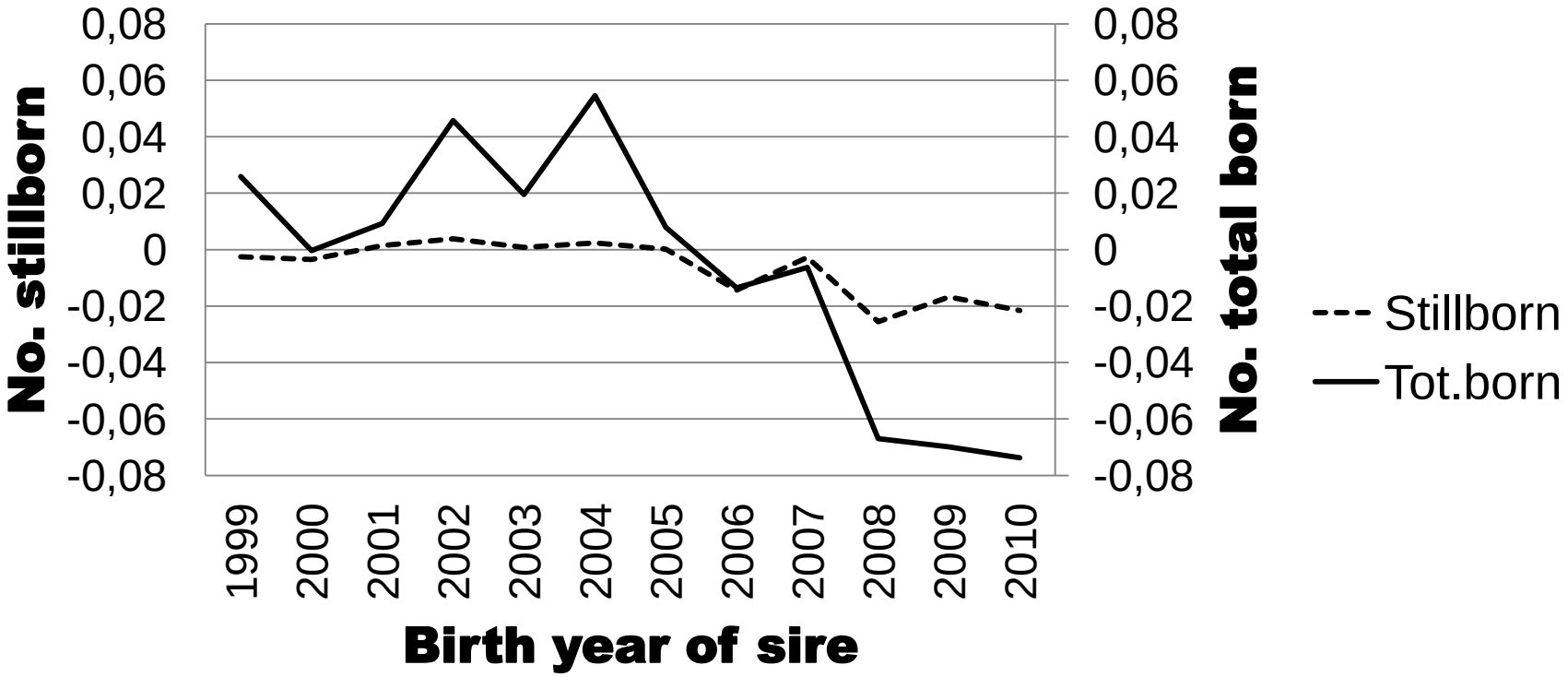
Phenotypic trends



Genetic parameters, paternal fertility

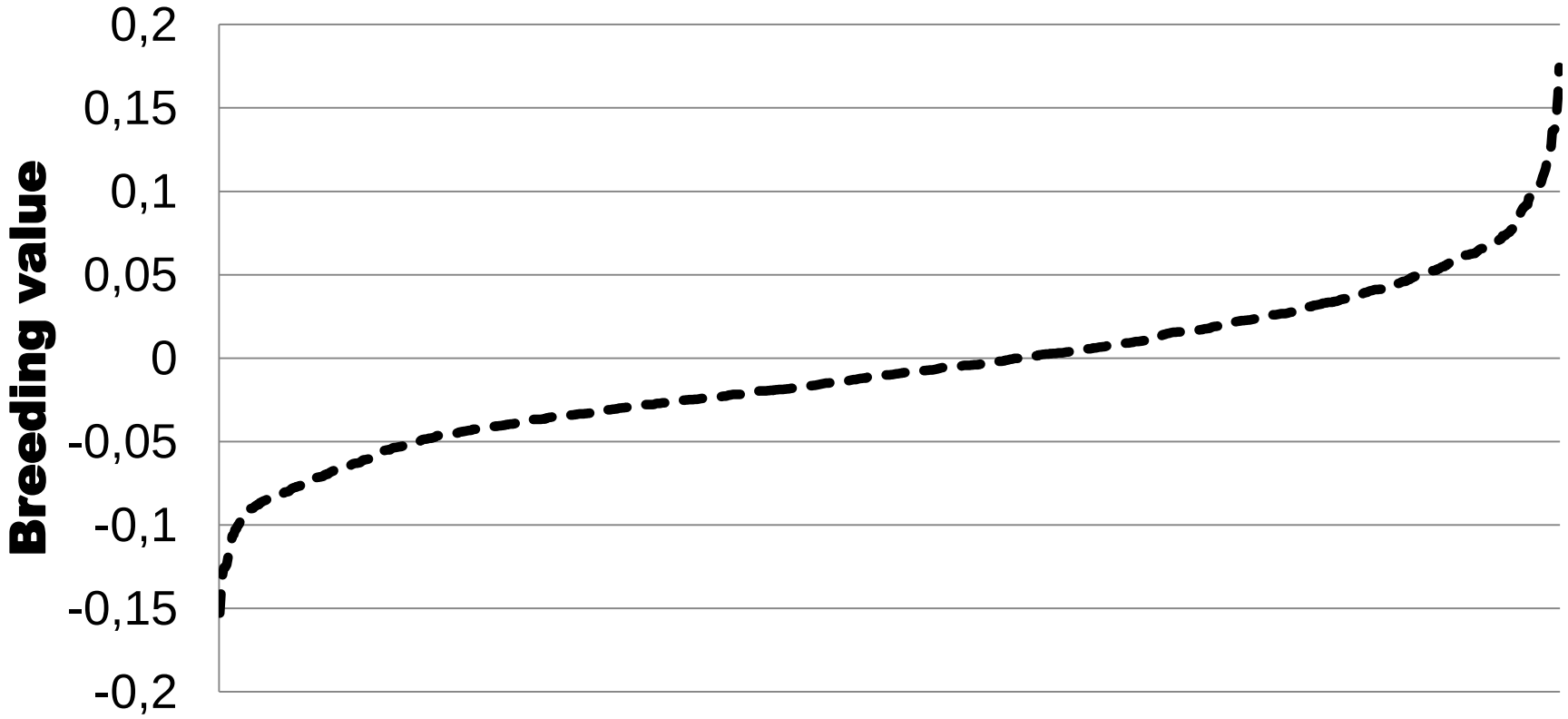
Trait	σ_A	h^2	r_G
TB	0.42	0.03	+0.49**
SB	0.12	0.01	

Genetic trends, paternal fertility

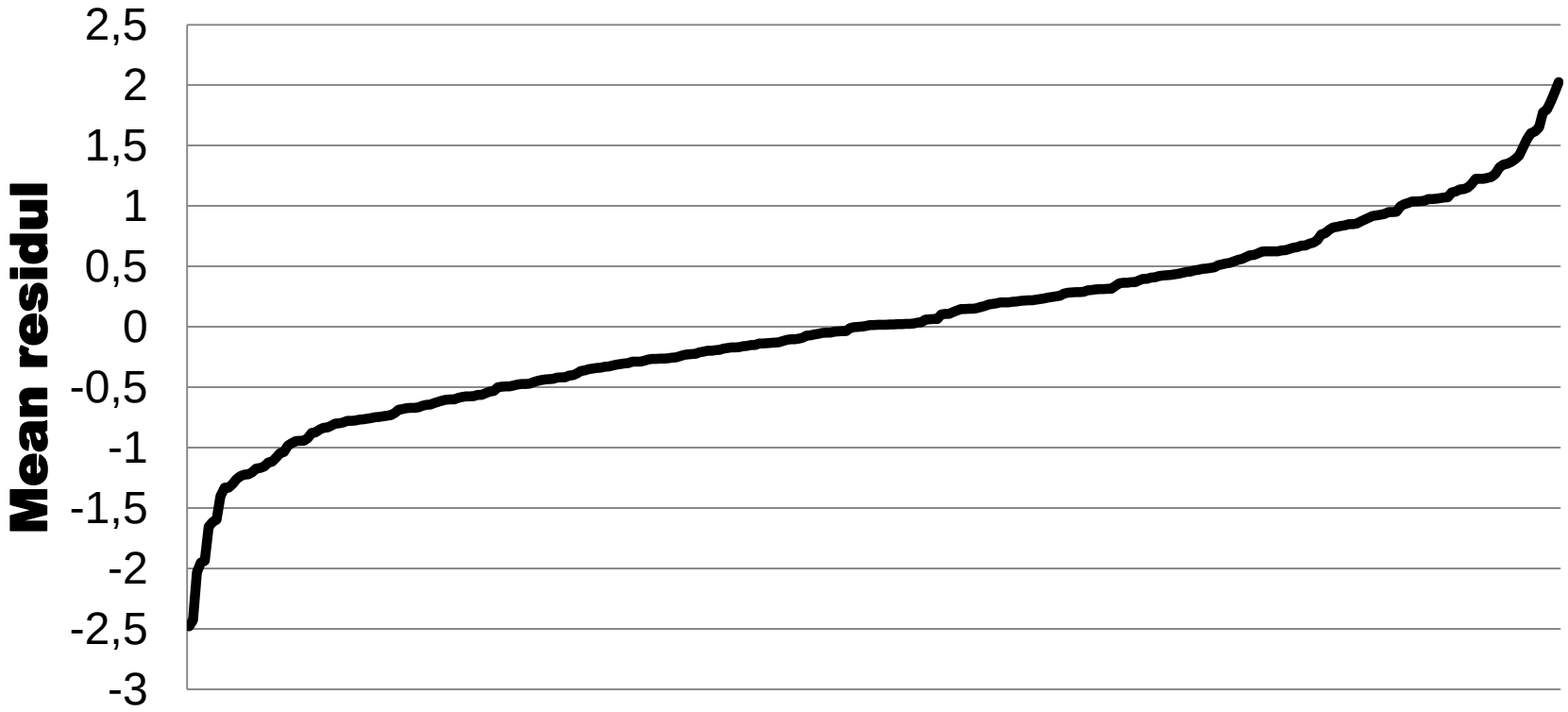


Paternal fertility; TB
Breeding values for 970 AI-boars

Paternal fertility; SB
Breeding values for 970 AI-boars

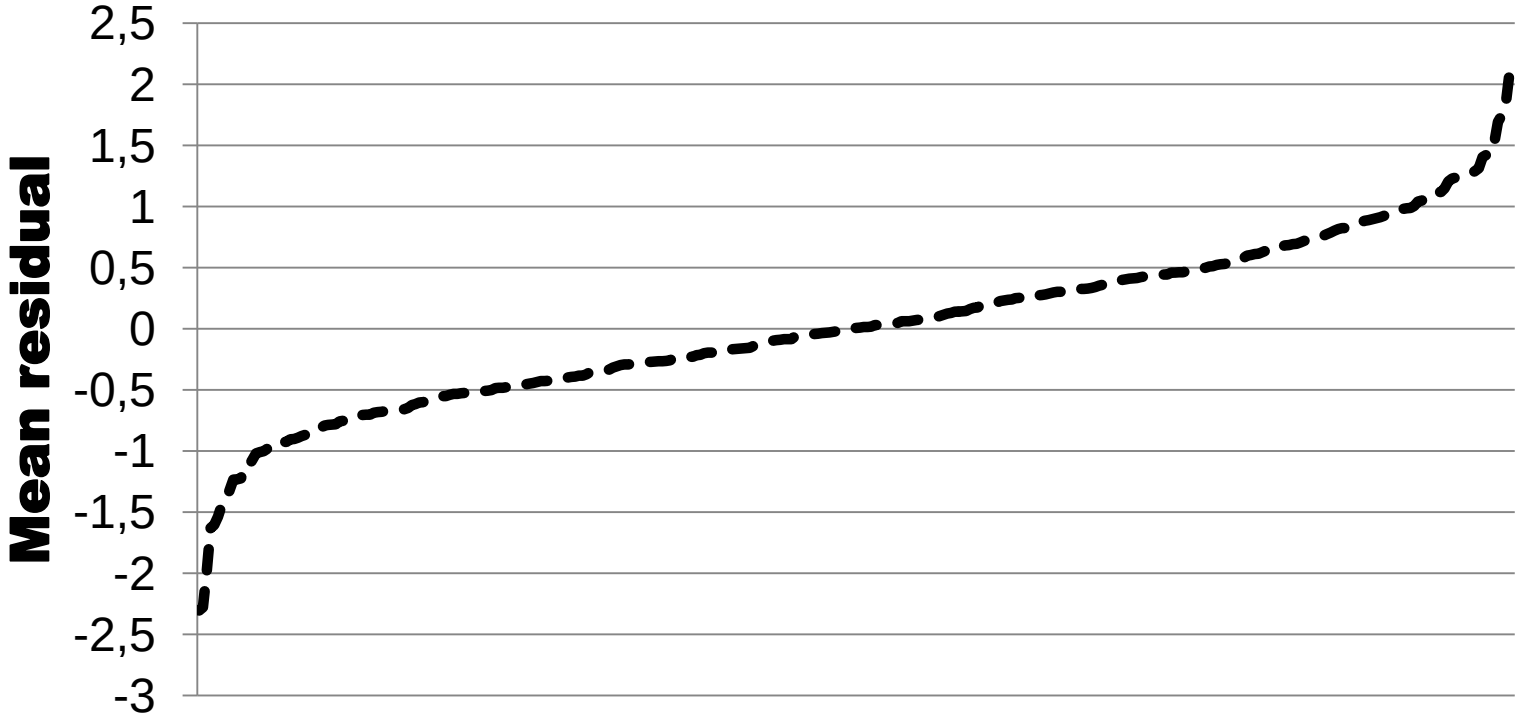


Means of residuals (TB; > 10 litters / AI-boar; n=347)



Stat. model incl. the fixed effects of parity, herd and year.

Means of residuals (SB; >10 litters / AI-boar; n=347)



Stat. model incl. the fixed effects of parity, herd and year.

Concluding remarks

- Low estimates of heritability for paternal fertility traits.
  In agreement with previous studies (Köck et al., 2009...)

- Approx. differences (best-worst) in EBV for the AI boars:
  1.4 (TB) and -0.3 (SB)

- Approx. differences (best-worst) residuals for the AI-boars:
  4.8 (TB) and -4.1 (SB)

Way ahead?????

- Selection for improved paternal fertility in sire lines
- Planned culling of AI-boars with low fertility after 5 (?) months of use. This needs feedback from commercial herds.
- Early indicators of inferior paternal fertility…..

Questions, Comments, Suggestions