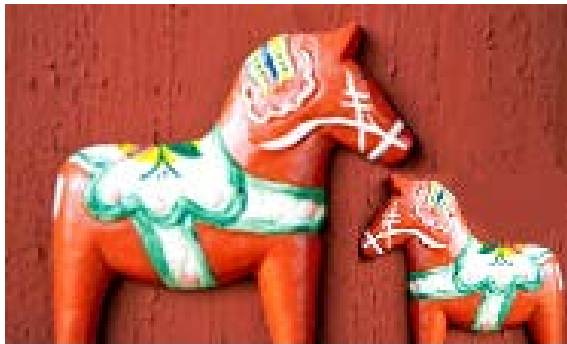


Factors influencing stallion reproductive success in Swedish warmblood riding horses and trotters



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Beauty, talent, power or speed is not enough...



Photo: Claes Kärstrand

To breed, he must be fertile!



Aim of the study

- To study the importance of different factors on foaling outcomes for Swedish stallions.
- To estimate repeatabilities for stallion reproductive success.



Material



- 313 Swedish Warmblood (SWB) stallions and 272 Swedish Standardbred Trotter (ST) stallions, 3-30 years of age.
- Seasonal data on no. of matings, foalings, stillbirths and twinbirths etc. per stallion.
- Stallions with > 10 mares during 2000-2006. In total, 72,468 mare-season combinations.

Material



- Inbreeding coefficients for ST stallions (0 - 15.5%):
- Scrotal width for 142 ST stallions

Trait definitions

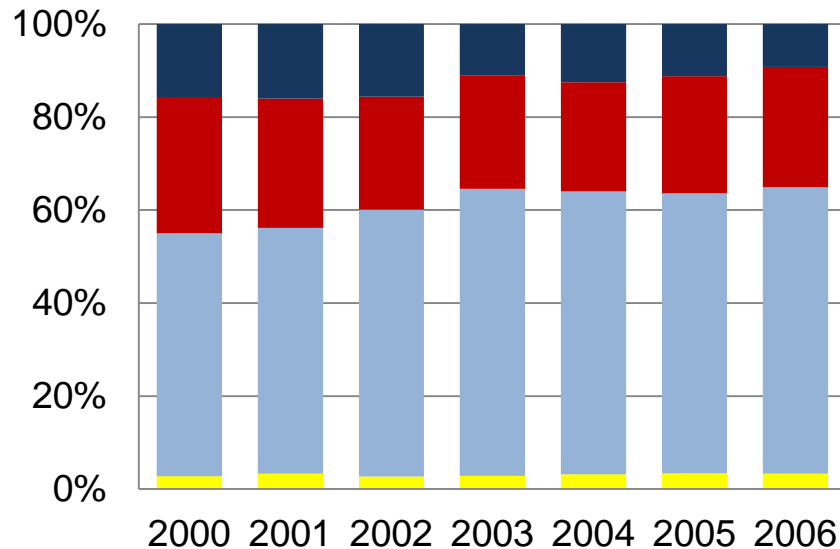
- No. of foalings =
live foals + dead foals – twinbirths.
- No. of (estimated) conceptions =
foalings + pregnant mares that died + reported abortions.
- Foaling or conception rate =
foalings or conceptions / matings.



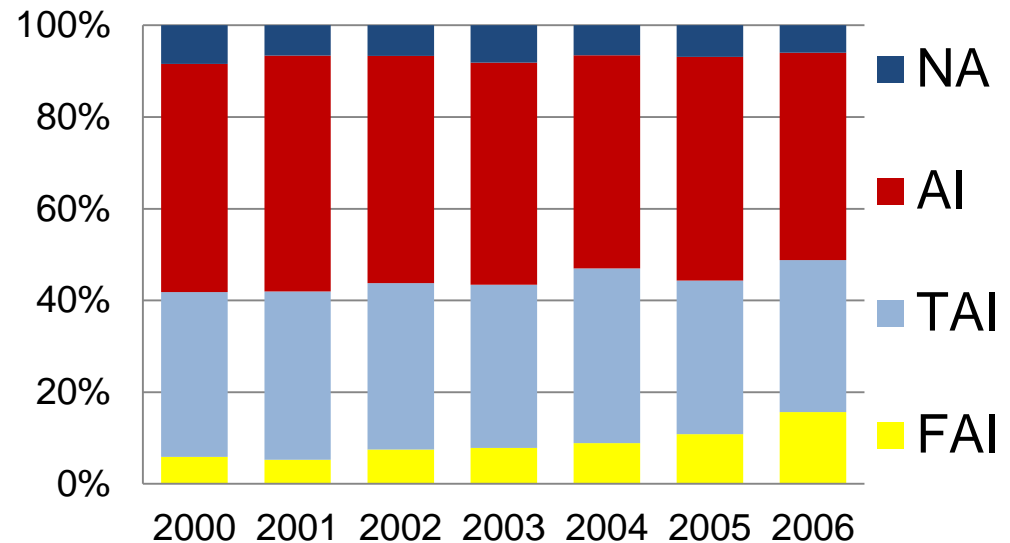
Material

- Natural matings (NA)
- AI with fresh semen (AI)
- AI with chilled transported semen (TAI)
- AI with frozen semen (FAI)

SWB

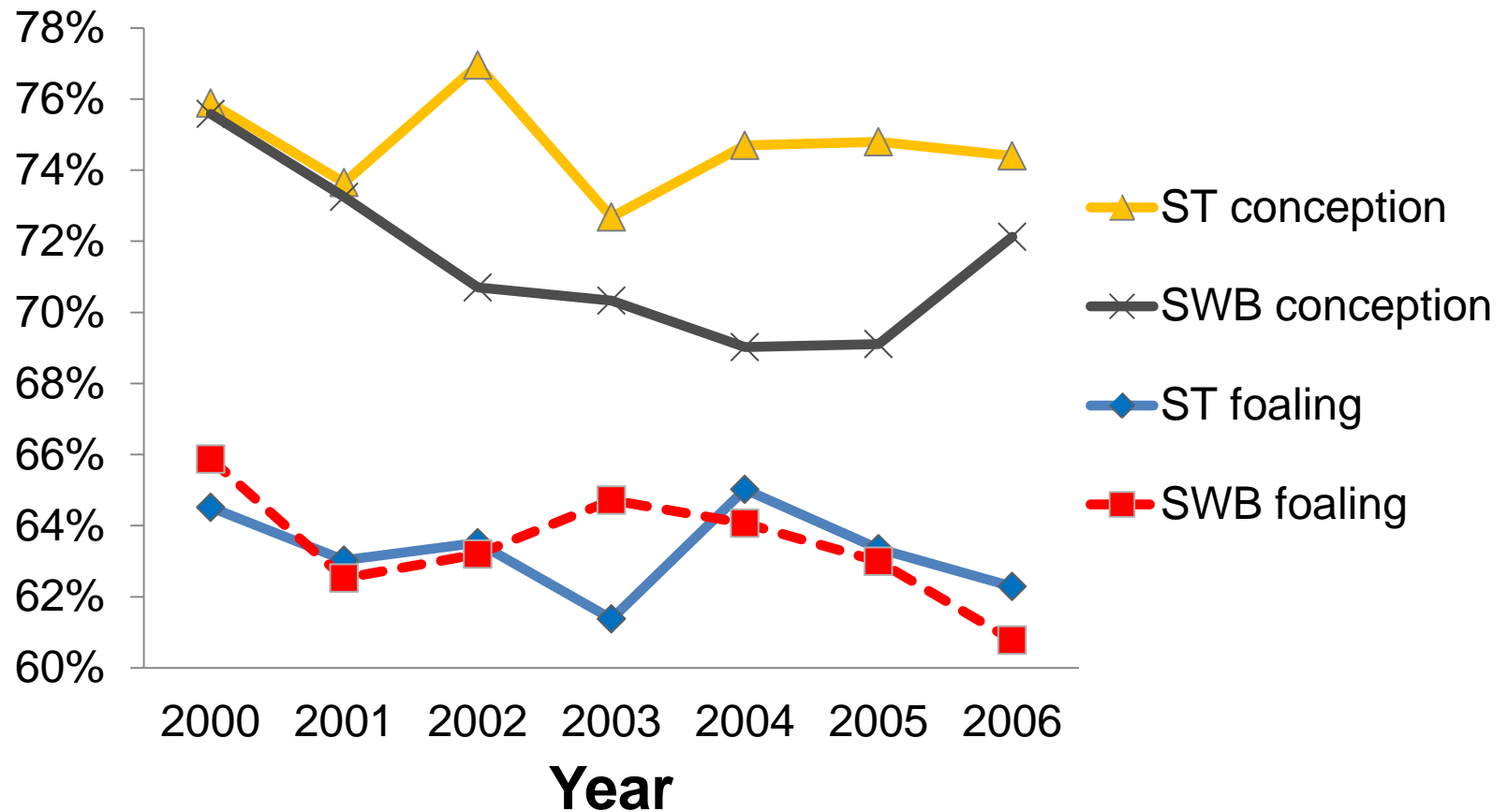


ST



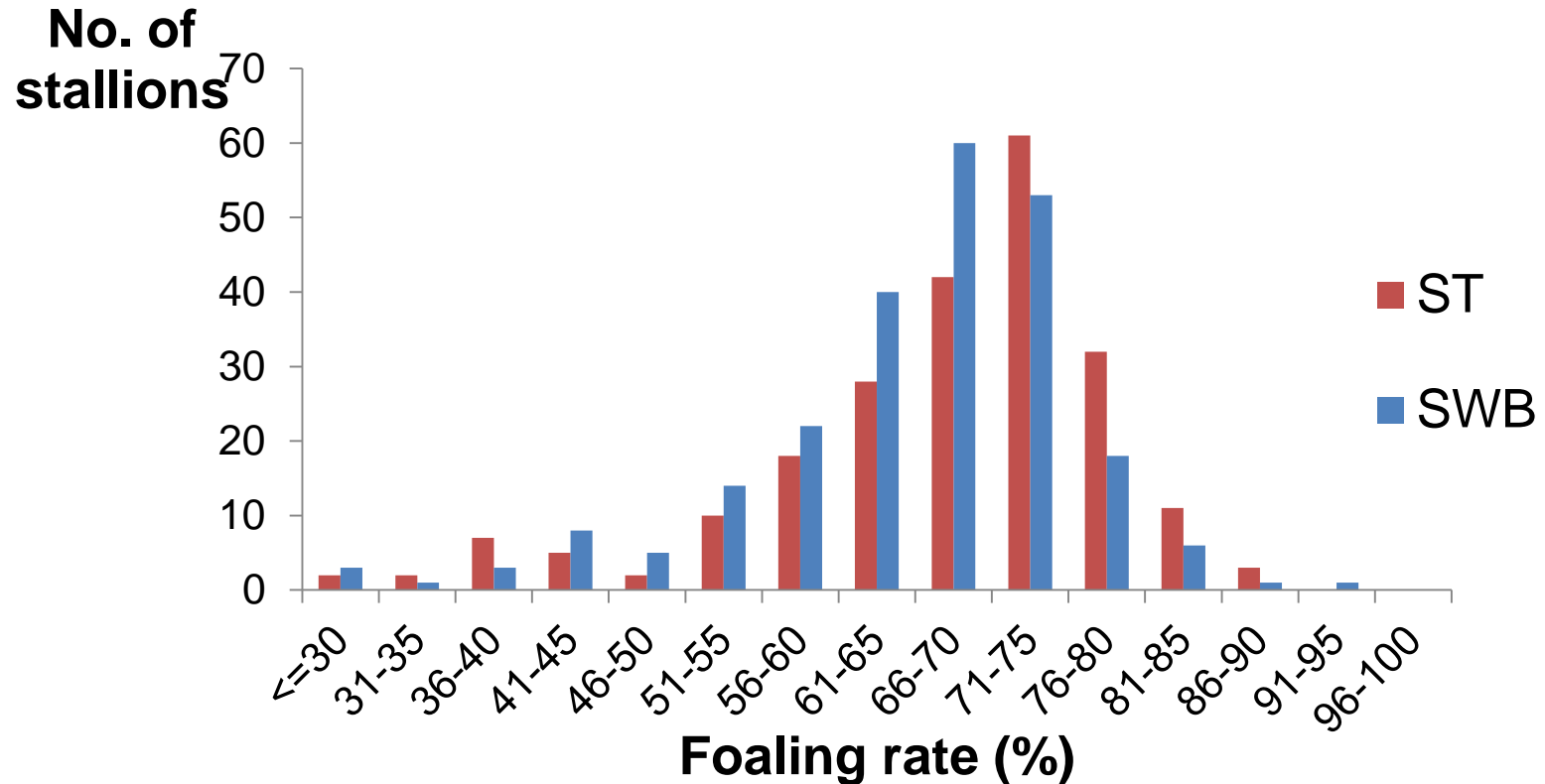
Material

Average conception rate (75% ST; 71% SWB), and average foaling rate (67% ST; 65% SWB).



Material

Stallions with at least 25 mares, all reproductive techniques included.



Methods

- Logistic regression (proc glimmix, SAS)
- Basic statistical model:
 $\text{logit}(\pi) = \mu + \text{year} + \text{age} + \text{repr.techn.} + \text{stallion}$
where π = probability of conception or foaling

Additional effects:

- + linear regr. on inbreeding coefficient (ST)
- + linear regr. on scrotal width (ST)

- Repeatabilities:
 $r = \sigma_s^2 / (\sigma_s^2 + \sigma_e^2)$, where $\sigma_e^2 = \pi^2/3$



Results

Significant effects for both traits:

- **Year** of mating/insemination ($p < 0.01$)
- Reproductive **technique** ($p < 0.01$)
- **Age** of stallion ($p < 0.01$)
- **Inbreeding** coefficient of stallion (ST) ($p < 0.01$)

Non-significant:

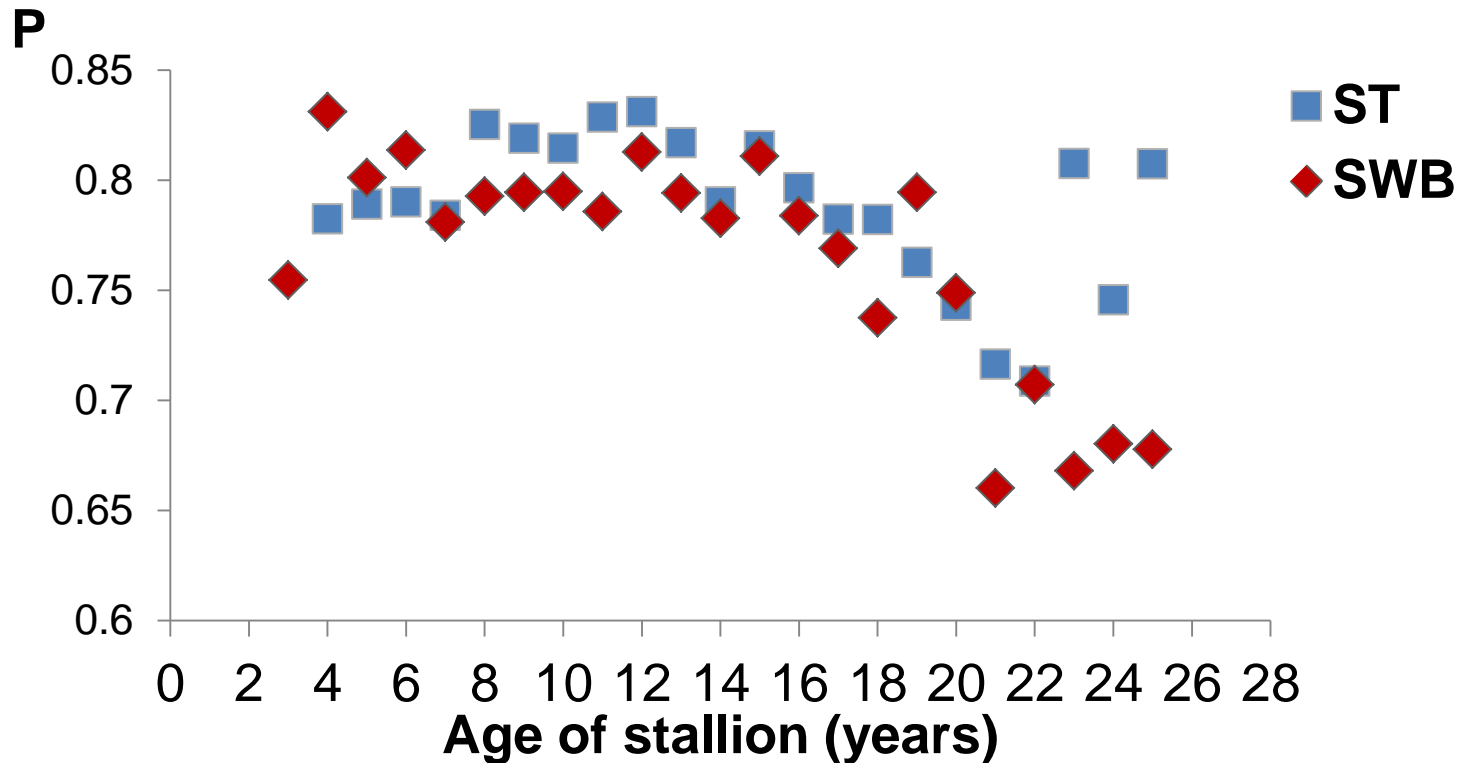
- **Scrotal width** (ST).



Photo Magdalena Johansson

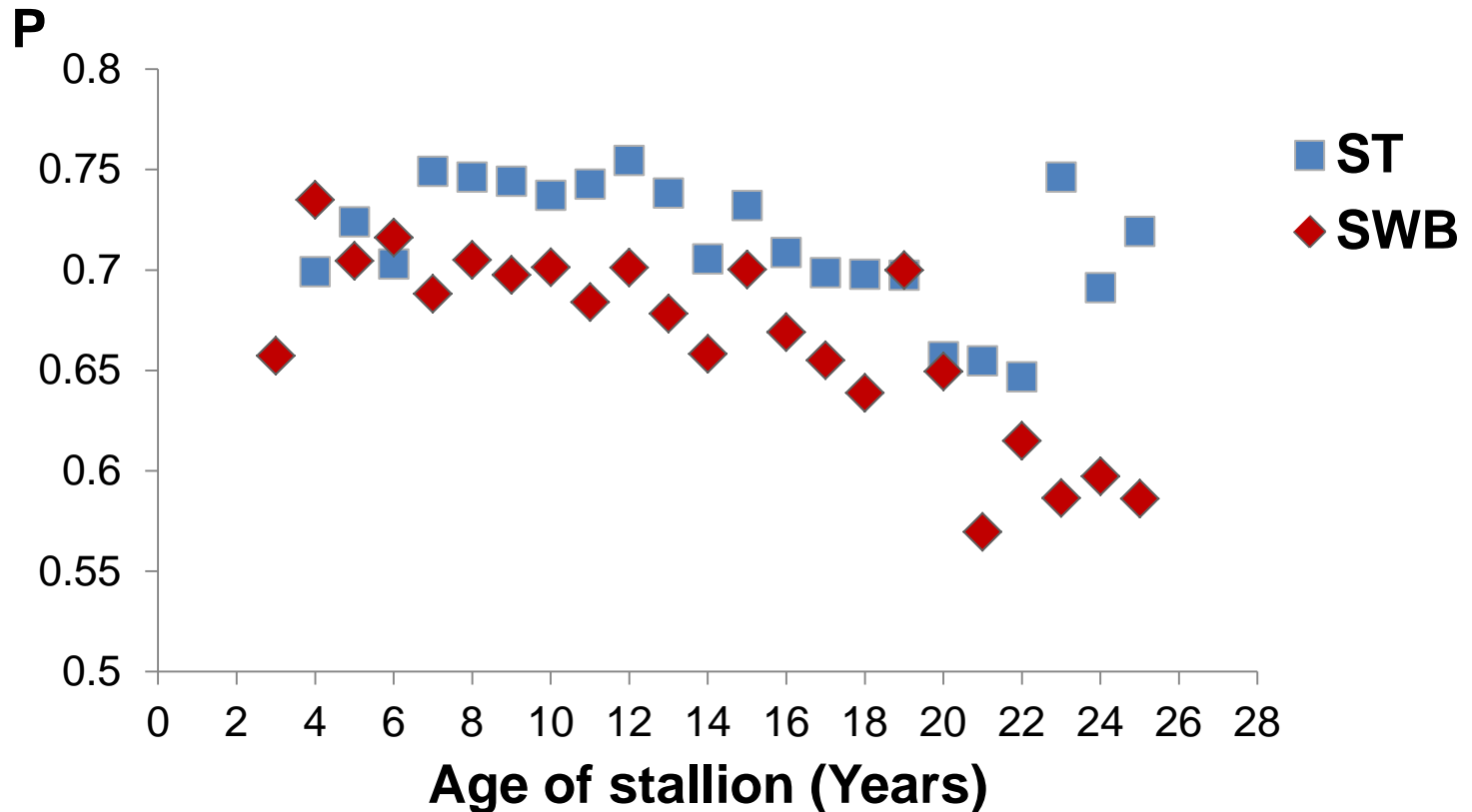
Results

Probability (P) of conception after AI with fresh semen



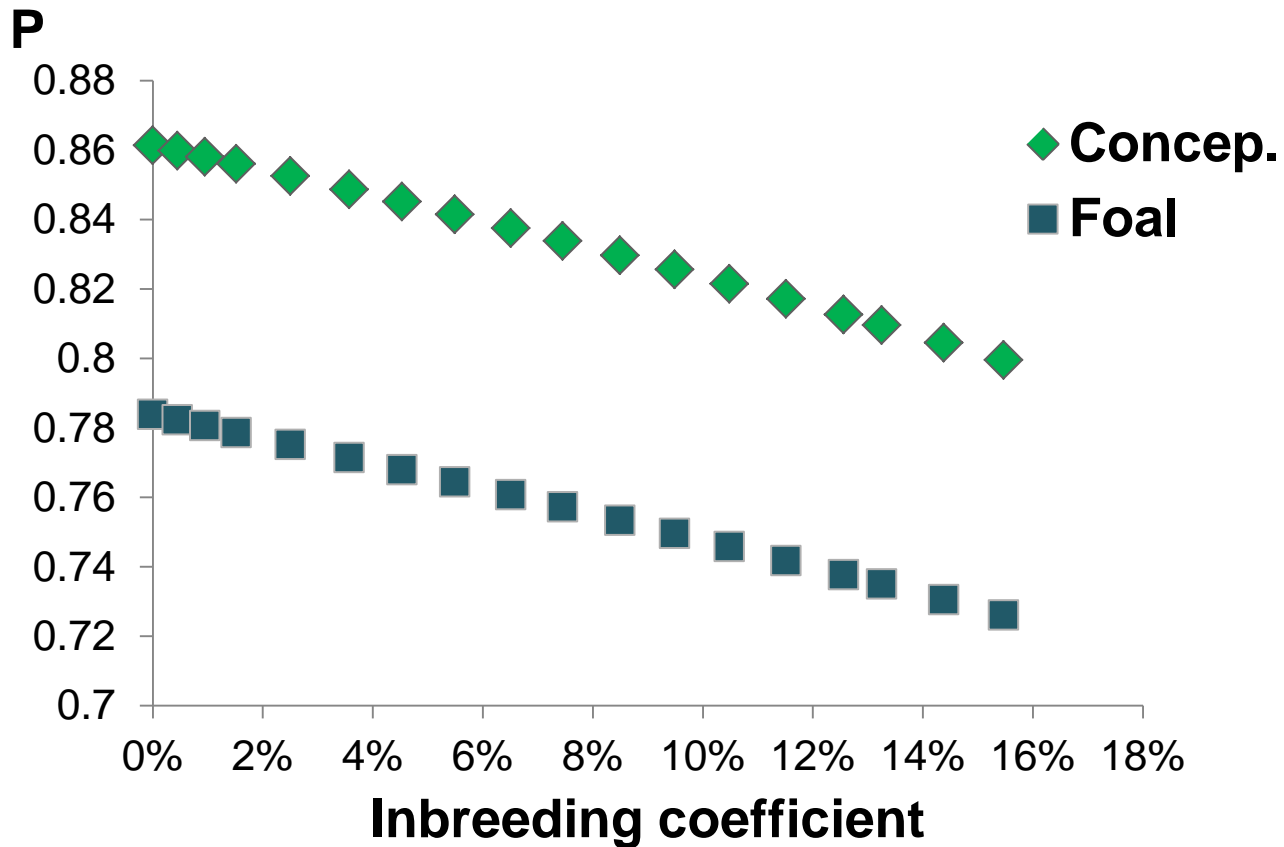
Results

Probability (P) of foaling after AI with fresh semen



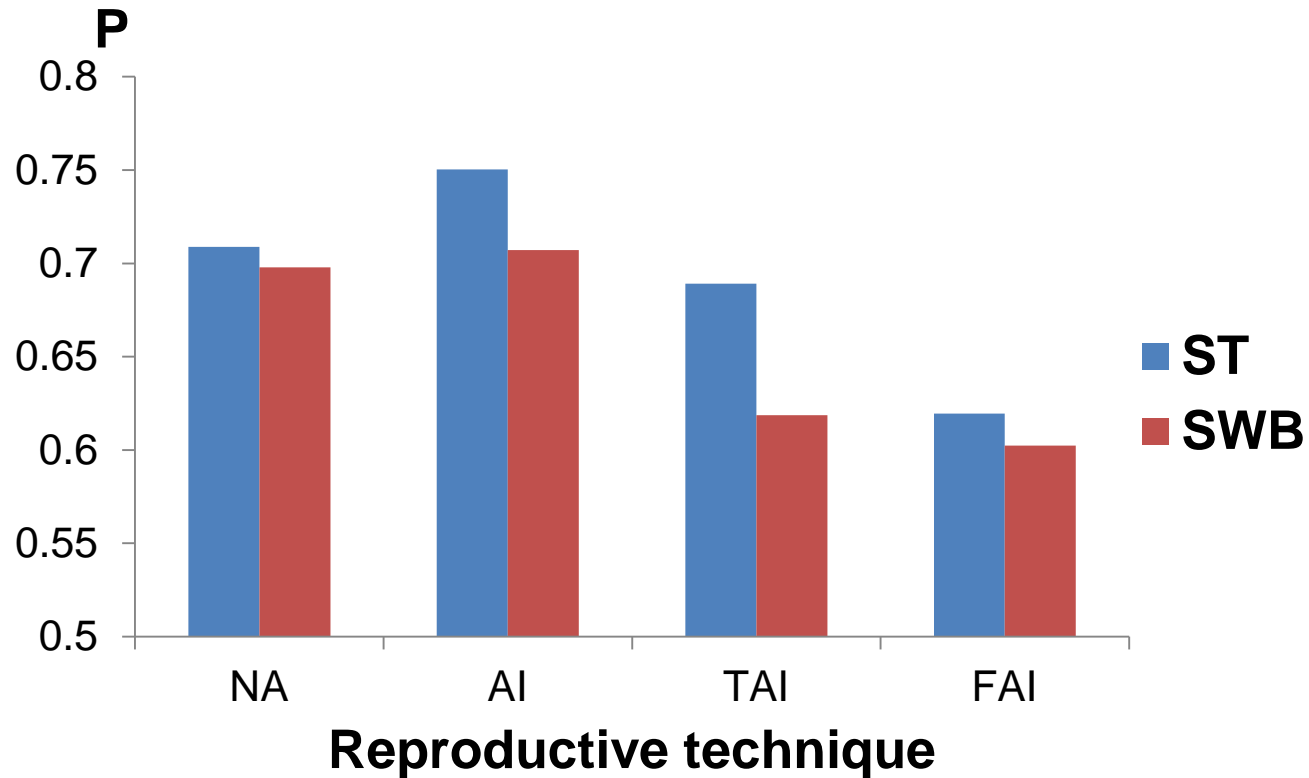
Results

Probability of conception and foaling using AI with fresh semen from 12-year-old ST-stallion



Results

Probability of foaling, after mating/AI with 12-year old stallion



Results

Generally low repeatabilities estimated:

- 0.07-0.08 for (estimated) conception results.
- 0.04-0.05 for foaling results.



Photo Magdalena Johansson

Conclusions

- Choice of reproductive technique had considerable effect on probability of conception or foaling.
- The foaling rate of stallions seemed to decline at ages > 14 .
- More inbreeding tend to give lower reproductive success.
- The repeatability of stallion reproductive performance between different years was low.



Further studies

- The research continues using more data, per cycle data and aiming at genetic analyses.



A young brown horse with a lighter mane and tail is standing in a grassy field. The horse is facing right and has its head slightly lowered. In the background, there is a white fence and some trees. The lighting suggests it might be late afternoon or early morning.

Thank you!

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