

Genomic selection on herd level

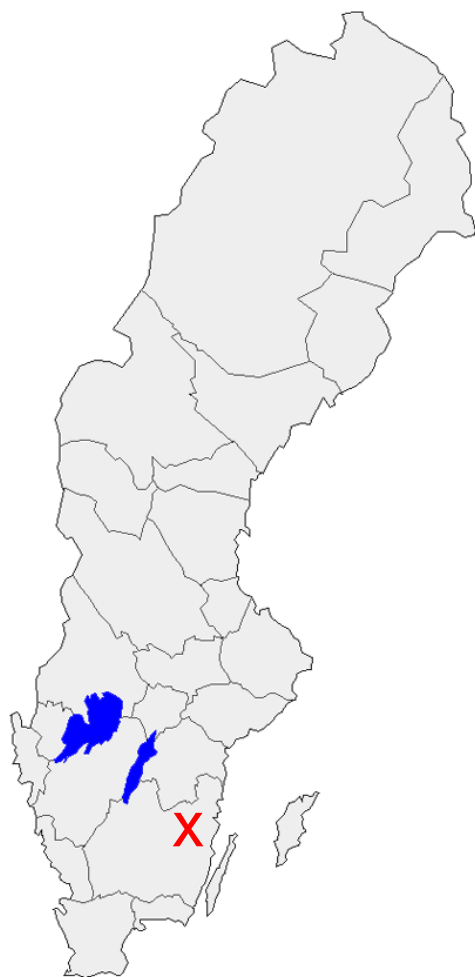


Per-Johan Svensson

• Disposition

- Södra Fågelhem, Södra Vi
- Genomic selection
 - Profitable on herd level
 - One tool to be used in combination with
 - Sexed semen
 - Embryo Transfer
 - Culling decisions
- Conclusions
- Questions

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Farm: Södra Fågelhem, Södra Vi

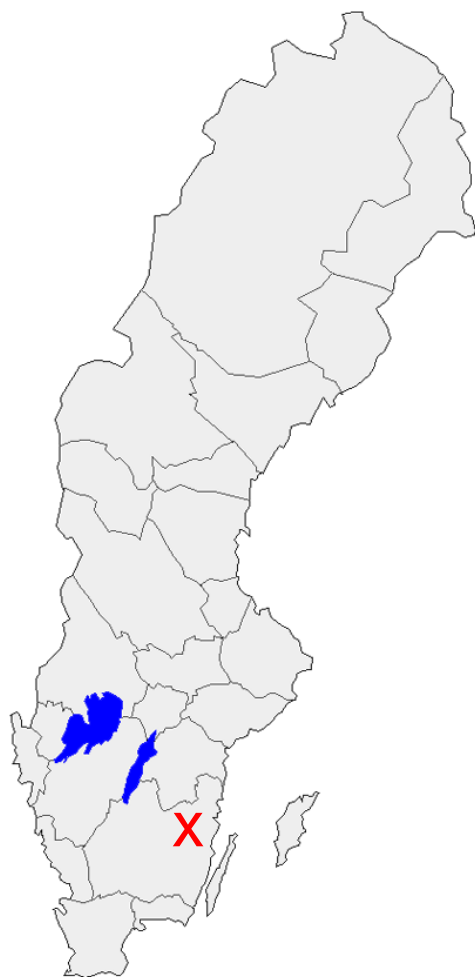
Pasture: 70 ha

Forest: 110 ha

Arable land: 100 + 130 ha

Crops:
grass
corn
spring wheat

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Herd

Breeds: 90 % SRB

of cows: 230

KG milk: 9 100 kg

% Fat: 4.1 %

% Protein: 3.5 %

Cell count: 240 ‘

Genomic selection; improving genetic progress in breeding programs

- GS is a powerful tool for AI-companies to indentify test bull candidates and GVP-bulls. The improved reliability above pedigree index is an important factor. With a high reliability of the “genomic proofs” the proportion of young bulls ranking high in the breed increases and more younger bulls are used.



• Genomic Selection; profitable on herd level

- GS on herd level gives additional information on females for the breeding plan. The aim is to get a herd with a higher NTM/better productivity/higher value of individual animals. However, it is costly and the option for changing of culling decisions is in most cases limited. To be interesting on herd level GS needs to be combined with other techniques.



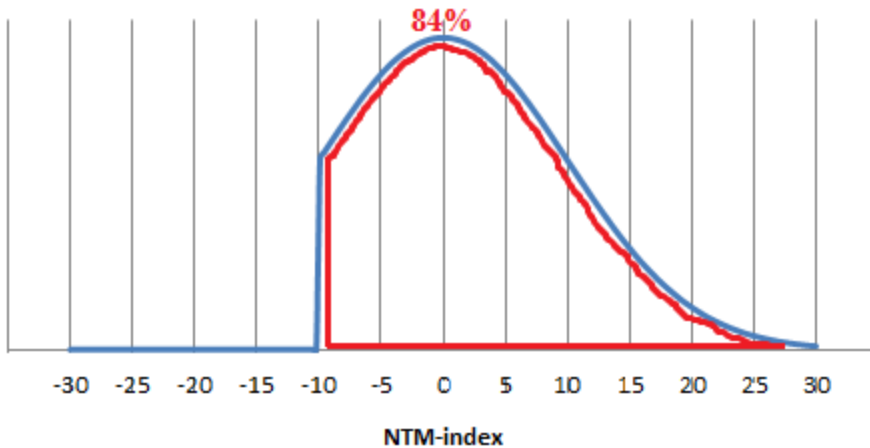
• Results from Johanna Rosengren

- Economic analysis of using sexed semen, embryo transfer and genomic selection on dairy cattle herds
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- Exam work at Alnarp, SLU spring 2012

- The work can be found at:
- <http://stud.epsilon.slu.se>

Use of sexed semen to improve heifer crop

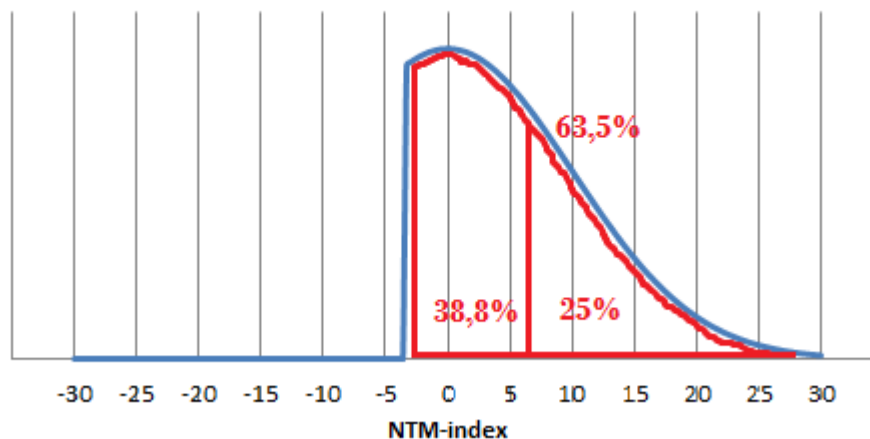
Konventionell seminering



2,5 lactation on average
42 % recruitment

Conventional semen, 84%

Könssorterad sperma



Sexed semen to top 25 %
Decrease the need to 63,5 %

On average has the heifers in the second alternative an enhanced NTM of 2,2 units.

• Use of sexed semen to improve heifer crop

- The value of the improved NTM due to selection on females corresponds to an improved live time profit per cow of about 34 Euro.
- Used of sexed semen to the best heifers is an economical alternative.
- GS is not needed to selection heifers to sexed semen on.

• Genomic selection; Embryo Transfer

- ET is costly and the chance to sell bull calves to VG increases if the dam has a high "genomic proof".
- The chance to sell bull calves to AI is the driving force for ET after genomic tests during Nordic conditions.
- Example
 - 20 tested heifers, 2 selected and flushed twice.
 - 4 class 1 embryos per flush and 50 % pregnancy rate.
 - 40 % of offered red bull calves are bought and 30 % for Holstein.

• Genomic selection; Embryo Transfer

- In a 100 cow herd the average live time profit will increase during this scenario with 47 Euro per red cow and 36 Euro per Holstein cow.
- An additional bonus can be achieved if the sold bull is selected to the GVP-segment and more royalties can be won or bulls sold that did not get started as test bulls. This corresponds to an increase of the life time profit with 22 Euro for red cows and 17 Euro for Holstein cows.
- It is essential to sell bulls to AI for a positive economic result and to have good results from ET.

• Genomic Selection; culling decisions

- To test all heifers in the herd before making culling decisions is today a very costly method.
- Calculations have been done for Irish and Australian conditions and the price for a test need to drop to 15-30 Euro.

• Genomic selection; conclusion

- Use of **sexed semen** is a feasible way to improve the female selection within herd. However, GS is not at all a prerequisite for using sexed semen.
- **Embryo Transfer** is a way for herds with good results to improve the chances to sell bull calves to AI.
- **Culling decisions** in the herd based on genomic information is costly and the price of the test must drop significantly.

• Thank you for your attention.



425 Bengta from Södra Fågelhem, daughter of Buckarby.