

# The value of performance recording in Beef cattle

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## #phenotypeisking

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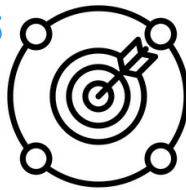
## The value of performance recording

- Genetic gain is partly driven by reliability
- Reliability is driven by:

Phenotypes

Pedigree completeness

Good data quality/ curation  
and models



Extent of genotyping

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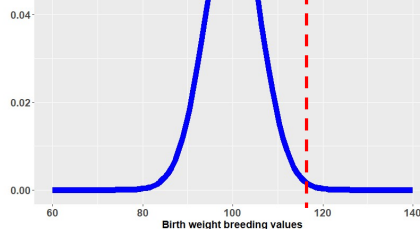


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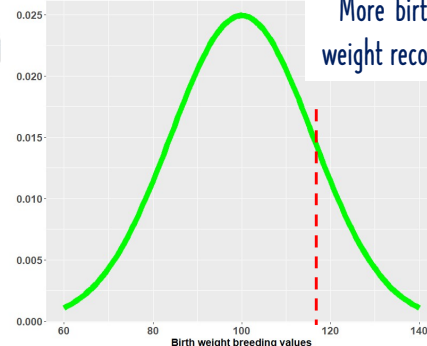
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## The value of performance recording in relation to accuracy of selection

Less birth weight  
records



More birth  
weight records



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More difficult to find target animals

Easier to find target animals

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## The value of performance recording in relation to accuracy of selection

Goal trait  
"Calving ease"



Indicator trait  
"Birth weight"

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## Performance for only one trait

Easy calving

We can only move in one direction, up or down

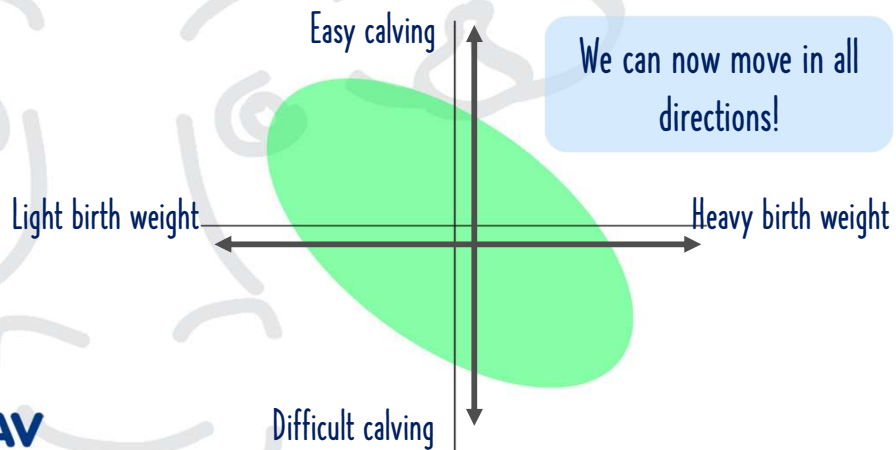
Difficult calving

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## Performance for two traits (on same animal)

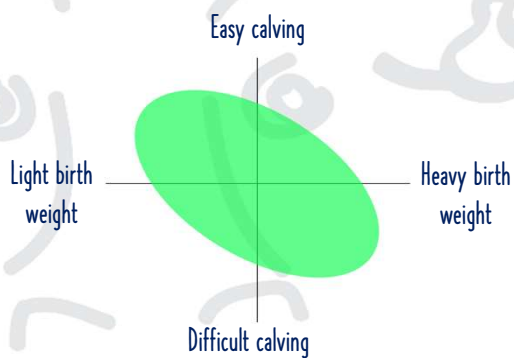


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## Performance for two traits (on same animal)

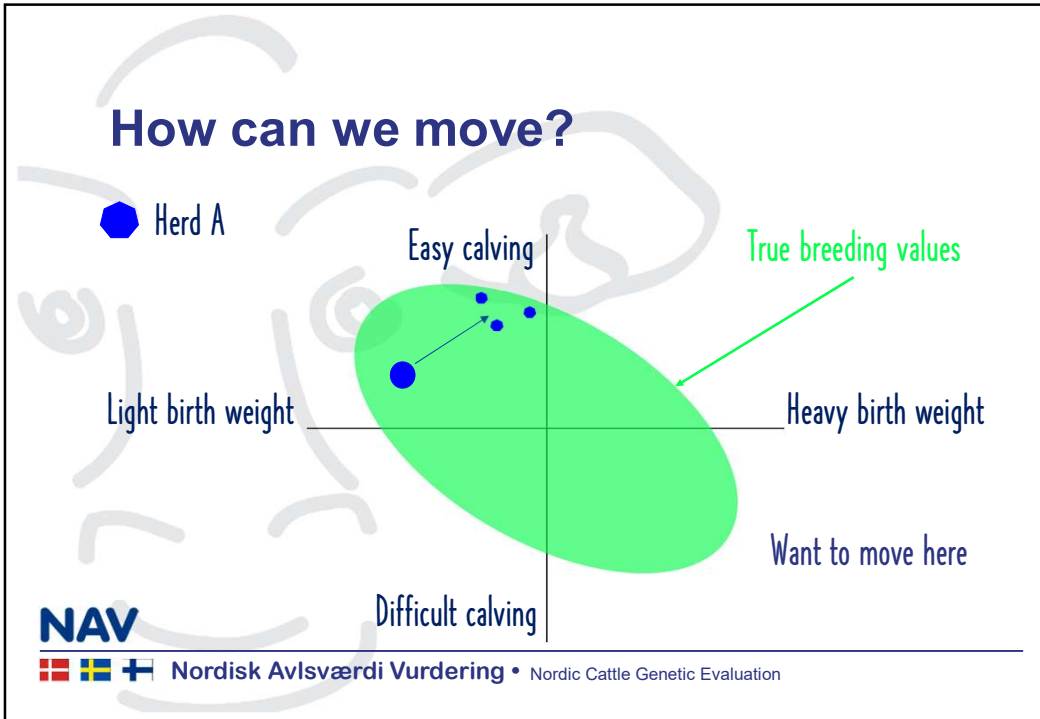


The limits of the ellipse are based on the genetic characteristics of each trait and how they relate to each other (correlation, heritability and genetic variation)

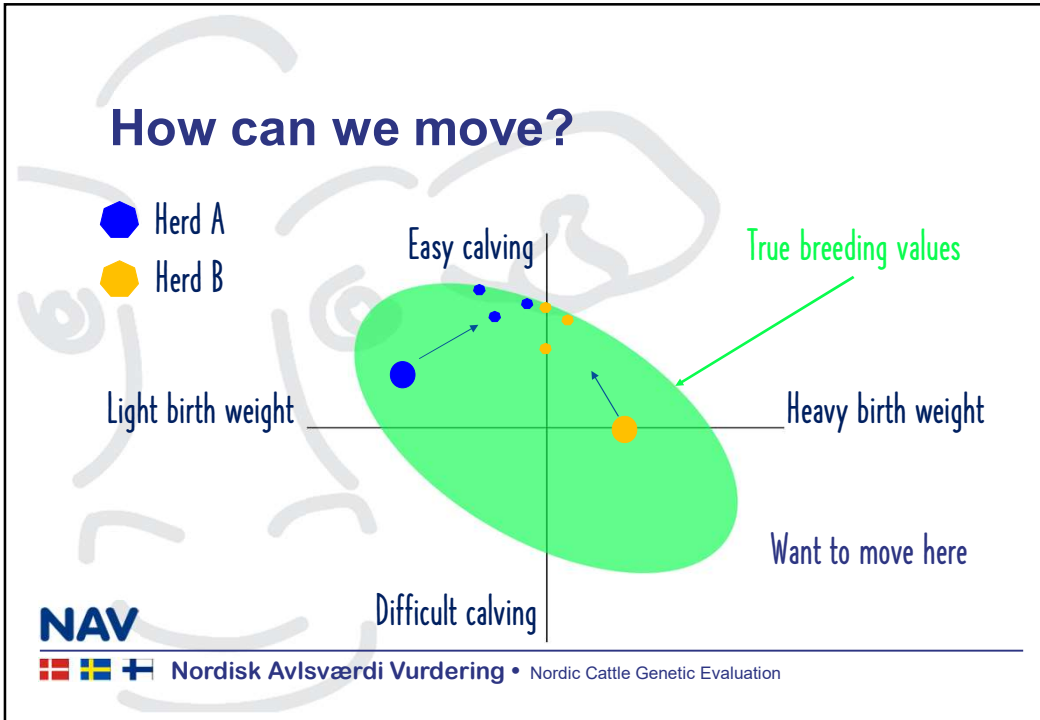
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## True & estimated breeding value

- In practice, we never know the true breeding value
- Instead we calculate estimated breeding values that are based on phenotypes.
- The more phenotypes we have to calculate breeding values the closer we get to the true breeding value
- Increasing the reliability of the EBVs – the tool for selection

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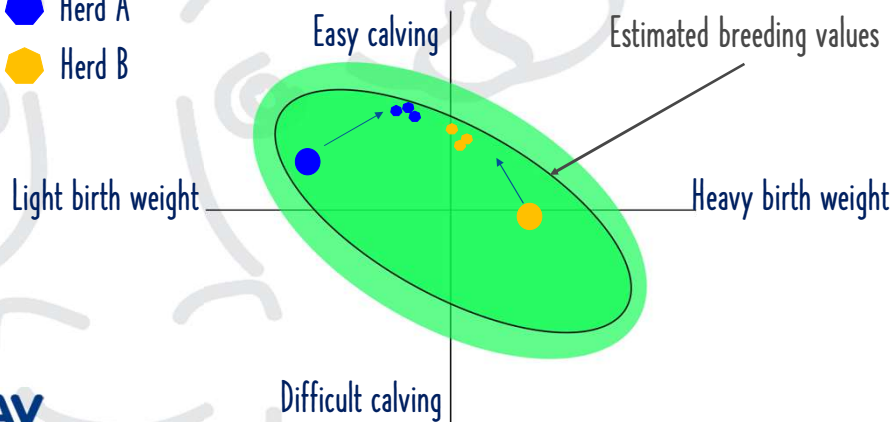
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## Performance for two traits – lots of performance records from the two traits on the same animals

 Herd A

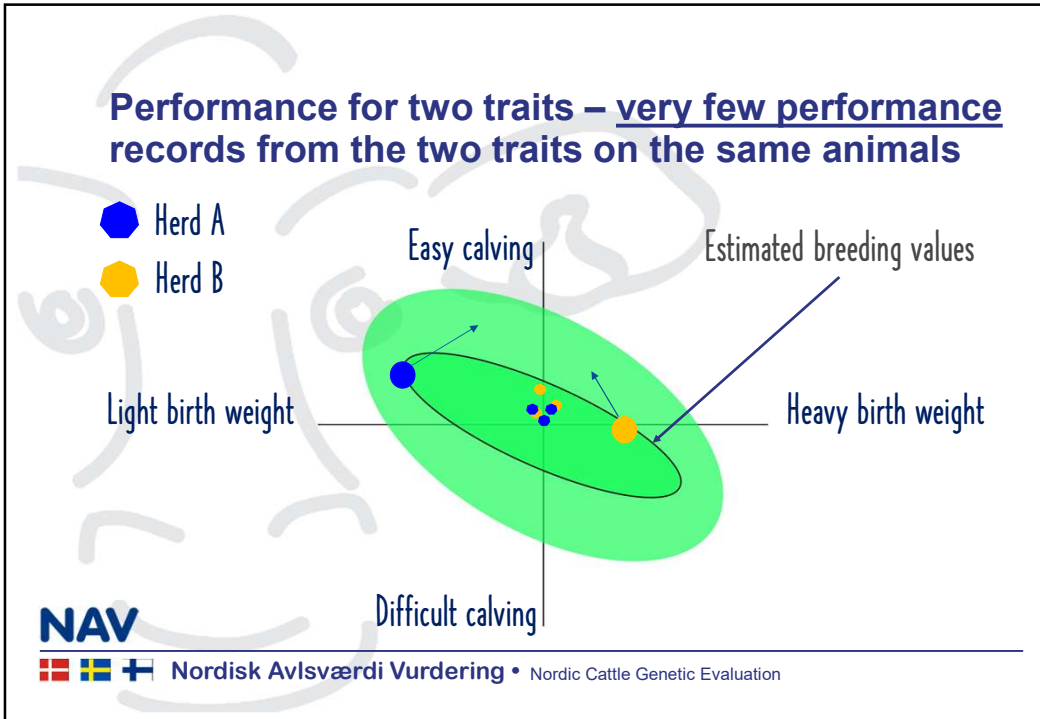
 Herd B



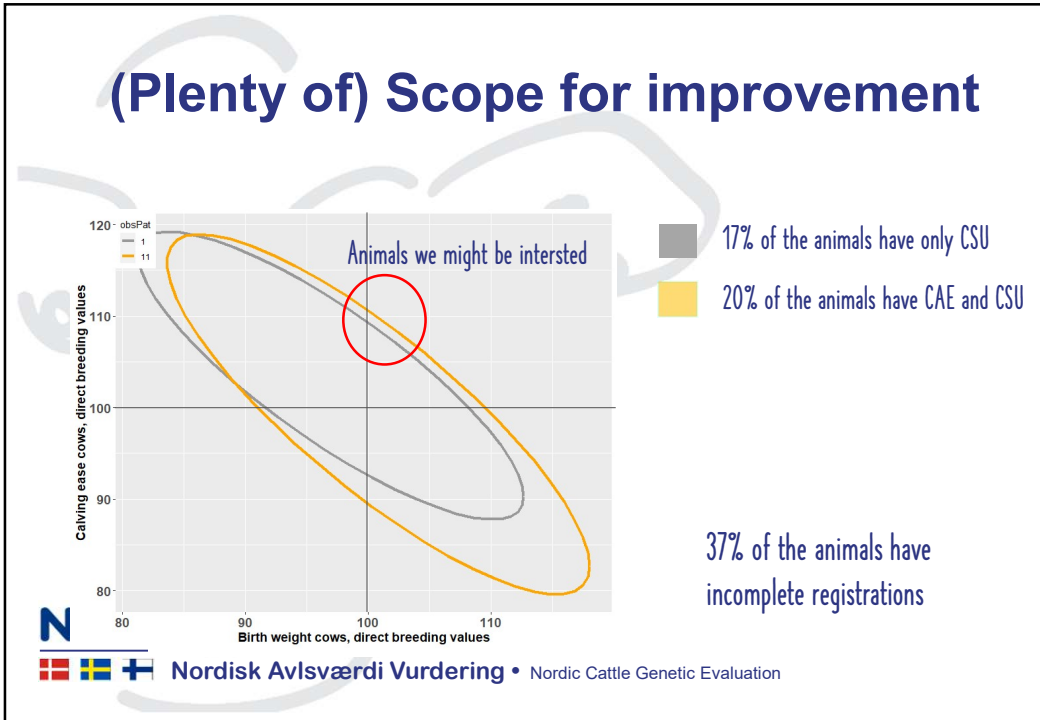
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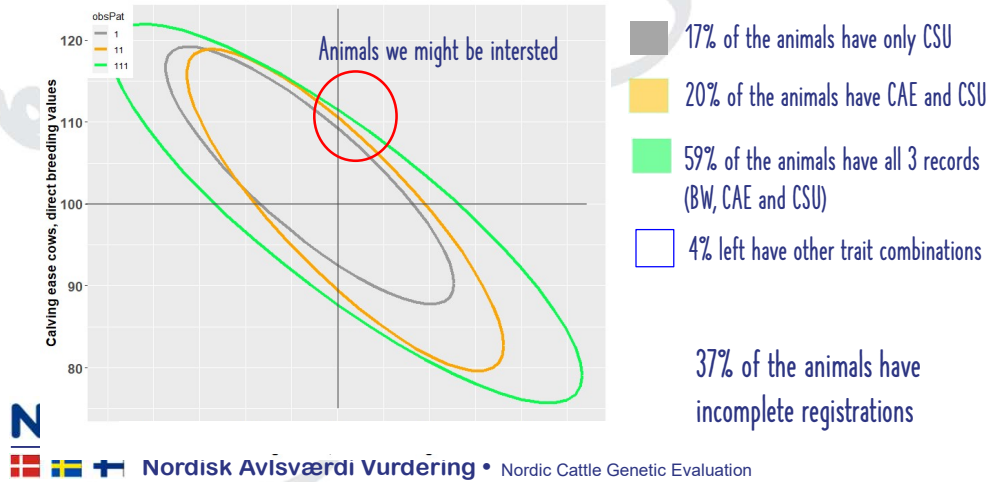


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## (Plenty of) Scope for improvement



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## Scope for improvement

- More birth weight
- More weaning weights
- More yearling weights
- More slaughter data
- Sire registrations
- Birth date
- etc.

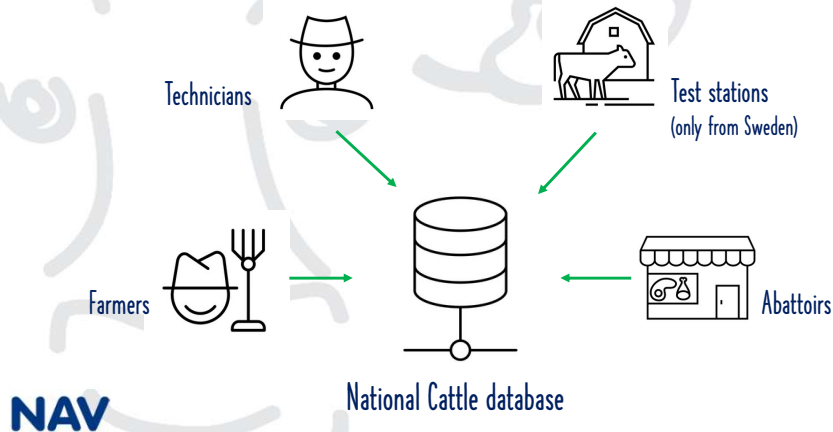
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## Sources of performance records

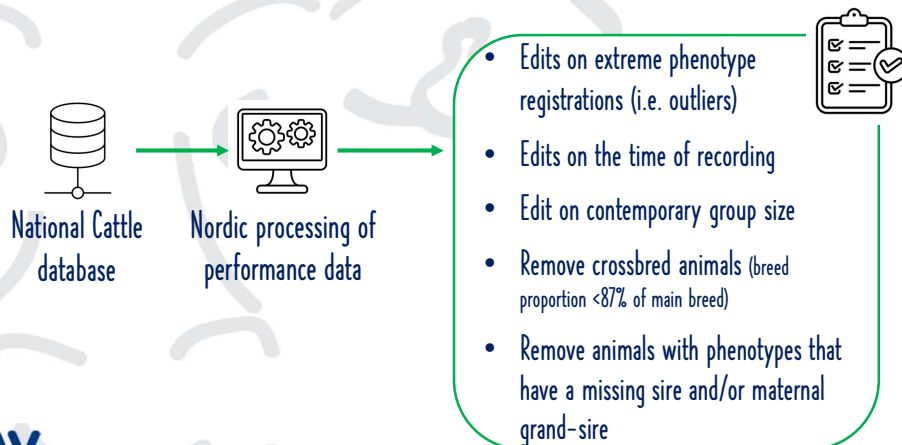


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## Processing of performance records



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## ANALYSIS OF DATA THAT IS AVAILABLE FOR THE EVALUATION

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## Calving performance records

- **Pattern of observations – how to read the tables**

Binary pattern	Birth weight	Calving ease	Calf survival
111	1	1	1
101	1	0	1
011	0	1	1
001	0	0	1

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## Pattern of calving records on the same animal (HER example)

- Percentage of animals recorded for birth weight, calving ease and calf survival in 2018
  - 61% DNK
  - 41% FIN
  - 87% SWE
- The pattern is consistent over time and across breeds – within country!

Hereford

	DNK	FIN	SWE
111	61	41	87
101	2	2	
11	28	18	13
1	9	38	

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## Pattern of weight records on the same animal (HER example)

- Only birth weight:**
  - 43% in DNK, 14% in FIN and 19% in SWE
- Several weights: (Birth weight, weaning weight gain and post-weaning weight gain):**
  - 50% SWE, 26% FIN and 0% DNK
- Slaughter data**
  - 50% FIN, 36% DNK and 15% SWE
- The pattern is consistent over time and across breeds – within country!

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## Incomplete pedigrees

- Large number of Danish animals with performance records are discarded from the evaluation due to incomplete pedigree information:
  - Denmark from 10% to 70% of the data is removed
  - Finland and Sweden only 1-2% of the data is removed.

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## Incomplete pedigrees from Denmark

### Percentage of data removed from Denmark by trait

- Yearling weight: 10% - 23% for CHA and SIM, respectively
- Slaughter data: 50% - 70% for LIM and HER, respectively
- Calving ease: 39% - 51% for LIM and HER, respectively
- Calf survival: 47% - 62% for LIM and HER, respectively

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## Last words...

- Nordic countries have an opportunity to increase genetic gain by improving performance recording and pedigree registrations
- There is the need to a solid and joint engagement from all industry actors across the three countries to increase performance recording
- Because, the value of genotyping increases when prediction can be applied to all economically relevant traits

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