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Nordic claw health index
Weight on single traits

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Survey of presentation

- Claw health traits are introduced already
- Short introduction of the NTM-economic model (originally presented at NAV workshop Jan. 8th, 2008)
- Adjustments for claw health traits
- Economic assumptions
- Results
Method: NTM - economic model
The model used for development of NTM in 2007-08

- Deterministic data simulation (Excel – farm accounting)
- Results expressed as: Marginal profit per cow per year
- Many assumptions: Economic, technical, biological

Shortcomings

- Insufficient modelling of cow culling process
- All cow replacement costs attached to longevity
  ”repair” by transfer of value from longevity
Introducing claw health traits into the NTM-model

- 7 additional traits (SU, SH, HH, DE, SP, WLS, CSC)
- For each trait: Breeding value for 1st, 2nd and 3rd lact. breeding values
- In total: 21 economic values should be estimated
Claw health traits

Phenotypic input to estimation of breeding values

SP, WLS, CSC

Two values: 0 = no disorder, 1 = disorder

Similar to mastitis, health (digestive diseases, feet&leg diseases, reproductive diseases)

SU, SH, HH, DE

Three values: 0 = no disorder, 1 = mild disorder, 2 = severe disorder

Require some additional scaling of economic values if costs of a mild disorder are not 50% of a severe disorder (similar problem for calving ease)
Which cost should **NOT** be included?

- The basic cost of the claw-trimming
- Veterinarian treatments: 
  
  *They are already included via the genetic evaluation in the other disease index*
- Effect on other diseases *(included in other disease index)*
- Permanent production loss *(included in yield index)*
- Effect on fertility *(included in fertility index)*
- Effect on longevity in general *(is included in longevity)*
Which cost should **BE** included?

- **Claw-trimmer costs:**
  - Extra costs caused by the disorder
  - Extra acute visits by the claw trimmer (Sole Ulcer)
  - *(BUT the basic cost of the claw-trimming itself should NOT be included)*

- **Herd owner/herdsman**
  - Extra work follow-up treatment should be included

- **Medicine, bandages or similar**
Which cost could be included?

We might consider additional effects not included in evaluation, e.g.

- Increased risk of death (not part of longevity)
- Cost related to weight loss
- General loss of vitality
Previous analyses of economic value of claw diseases

Common to most analyses are that a major part of the economic value of a claw disorder is determined by

- Cost of permanent production loss
- More subsequent claw disease or other diseases
- Lower fertility
- Costs due to increased risk of culling

Most of the analyses are based on costs of veterinarian treatments (include vet. costs)

From a breeding perspective: They include mostly costs that we do not want to include in the economic value of our claw health index
Previous analyses of economic value of claw diseases

In a Swedish report by Marcus Oskarsson there are detailed estimates of costs connected to claw-trimmer records for SU, DE and SP. That include:

• Claw trimmer cost
• Extra work for herdsman
• Medicine, bandages, other treatment costs
• *(and permanent production loss)*

Consultations with a Danish expert (Pia Nielsen)

*NB: Pia Nielsens estimates of costs were somewhat lower than those of Oskarsson*
## Basic cost per Claw disorder

<table>
<thead>
<tr>
<th></th>
<th>Mild disorder</th>
<th></th>
<th></th>
<th>Severe disorder</th>
<th></th>
<th></th>
<th>Acute effect/Treatment, €</th>
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<tbody>
<tr>
<td></td>
<td>Extra work, herdsman, Minutes</td>
<td>Extra work, Claw trimmer, Minutes</td>
<td>Treatment, €</td>
<td>Extra work, herdsman, Minutes</td>
<td>Extra work, Claw trimmer, Minutes</td>
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<tr>
<td>SU</td>
<td>30</td>
<td>5</td>
<td>0</td>
<td>270</td>
<td>5</td>
<td>80</td>
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<tr>
<td>SH</td>
<td>15</td>
<td>2.5</td>
<td>0</td>
<td>30</td>
<td>5</td>
<td>0</td>
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<tr>
<td>HH</td>
<td>15</td>
<td>2.5</td>
<td>5</td>
<td>30</td>
<td>5</td>
<td>10</td>
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<tr>
<td>DE</td>
<td>15</td>
<td>2.5</td>
<td>5</td>
<td>30</td>
<td>5</td>
<td>10</td>
<td></td>
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<tr>
<td></td>
<td>All disorders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SP</td>
<td>30</td>
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<td>5</td>
<td>10</td>
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<td></td>
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<tr>
<td>WLS</td>
<td>15</td>
<td>2.5</td>
<td>0</td>
<td>0</td>
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<tr>
<td>CSC</td>
<td>0</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>
Basic cost per claw disorder

- Same basic cost for all countries
- Same basic cost for all breeds
- Cost of herdsman work: Same as in 2008 model
- Cost of claw trimmers work per minute: 4 x herdsman
- Other costs: Assumed to be at same level as in 2008

Consequence: Economic value for claw health traits are comparable with the economic values estimated in 2008
Results

7 traits, 3 lactations, 3 countries, 3 breeds
The NTM-model produces $7 \times 3 \times 3 \times 3 = 189$ different values

In report: Results are summarized across all lactations

Difference in frequencies of disorders causes:

- Different values for breeds (small differences)
- Different values for countries
  - Difference between DNK and SWE is small
  - Large deviation for FIN, because severe disorders are absent in FIN data (especially SU)
  - Therefore: The final result used is average of DNK and SWE
## Main results:
Value of breeding values summed across lactations

<table>
<thead>
<tr>
<th></th>
<th>Unit</th>
<th>HOL</th>
<th>RDC</th>
<th>JER</th>
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<tbody>
<tr>
<td>Protein</td>
<td>Kg</td>
<td>4.60</td>
<td>4.81</td>
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<td>Feet&amp;Leg diseases</td>
<td>%-units</td>
<td>1.75</td>
<td>1.70</td>
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<td>Feet&amp;Legs conf.</td>
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<td>17.0</td>
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<td>64.91</td>
<td>65.23</td>
<td>66.43</td>
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<td>8.67</td>
<td>8.71</td>
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<td>HH</td>
<td>Point</td>
<td>13.98</td>
<td>14.05</td>
<td>14.52</td>
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<tr>
<td>DE</td>
<td>Point</td>
<td>13.98</td>
<td>14.05</td>
<td>14.52</td>
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<tr>
<td>SP</td>
<td>Point</td>
<td>25.56</td>
<td>25.68</td>
<td>24.14</td>
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<tr>
<td>WLS</td>
<td>Point</td>
<td>8.67</td>
<td>8.71</td>
<td>9.00</td>
</tr>
<tr>
<td>CSC</td>
<td>Point</td>
<td>9.67</td>
<td>9.73</td>
<td>12.81</td>
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</table>
Main results:
Value of breeding values relative to value per SU-point

“Making breeding values (not indexes) comparable on the SU-scale”

<table>
<thead>
<tr>
<th></th>
<th>HOL</th>
<th>RDC</th>
<th>JER</th>
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<tbody>
<tr>
<td>SU</td>
<td>1.000</td>
<td>1.000</td>
<td>1.000</td>
</tr>
<tr>
<td>SH</td>
<td>0.134</td>
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<tr>
<td>HH</td>
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<td>0.215</td>
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<tr>
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<td>0.215</td>
<td>0.219</td>
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<tr>
<td>SP</td>
<td>0.394</td>
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<td>0.363</td>
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<tr>
<td>WLS</td>
<td>0.134</td>
<td>0.134</td>
<td>0.136</td>
</tr>
<tr>
<td>CSC</td>
<td>0.149</td>
<td>0.149</td>
<td>0.193</td>
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</table>
Conclusion

• Claw traits included in the NTM-model

• Basic costs: Mostly based on Marcus Oskarssons report

• Breed and country differences are small (except Finnish results for SU)