Joint Nordic Test Day Model: Experiences with the New Model

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Objectives of joint evaluation

• Better use of
  – Data
  – Resources

• Direct comparison of animals
  – Across borders
Nordic Cattle Genetic Evaluation, NAV

• Joint evaluation since April 2005
  – Type traits
  – Female fertility
  – Milkability
  – Temperament
  – Leakage
First joint evaluation for yield traits

- April 2006
- EBVs from joint evaluation compared to national proofs
  - Each animal gets the same NAV-EBV for the same biological trait in DNK, FIN and SWE
# Data

All dairy cattle from Denmark, Finland, & Sweden

<table>
<thead>
<tr>
<th></th>
<th>Red Breeds</th>
<th>Holstein</th>
<th>Jersey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Animals</td>
<td>4.1 mil.</td>
<td>6.6 mil.</td>
<td>0.6 mil.</td>
</tr>
<tr>
<td>TD yields</td>
<td>45.6 mil.</td>
<td>81.6 mil.</td>
<td>7.2 mil.</td>
</tr>
<tr>
<td>305d yields</td>
<td>1.9 mil.</td>
<td>1.6 mil.</td>
<td>-</td>
</tr>
</tbody>
</table>

Nordisk Avlsværdivurdering

Changes in data and models

- Additional data from neighboring countries
- Pedigree information combined
  - More accurate information from the originating country
  - Affects genetic groups etc.
Changes: Denmark

- From single trait repeatability to multitrait multilactation model
- From 305d to TD data
- Exclusion of older data
- Different procedure for heterosis estimation
- Different procedure for HV correction
Changes: Finland

- New: heterosis + recombination loss included in the model
- New: accounting for HV
Changes: Sweden

- From repeatability to multilactation model
- Exclusion of older data
- Different procedure for heterosis estimation
- Different procedure for HV correction
Publishing EBVs

- Relative EBVs
- Mean 100, SD 10 index points
  - Common base: cows from DNK, FIN, SWE
- 1st, 2nd and 3rd lactation EBVs combined
  - Weights: 0.5 : 0.3 : 0.2
- Common yield index: milk + protein + fat
  - Weights: -1 : 4 : 1
Correlations: NAV and national EBVs

- **Sires**: 0.95-0.99
  - More fluctuation in RDM (Orig. Red Dane)
- **Cows**: 0.90-0.95
  - Slightly lower for fat yield
Considerable re-ranking

- Additional data:
  - Proven elite sires
  - Young bulls from mutual testing program
    - 153 Red breed, 21 Holstein bulls

- Sires:
  - Effects of heterosis and recombination loss

- Cows:
  - Simultaneous accounting for HV
Example: T Funkis

<table>
<thead>
<tr>
<th></th>
<th>DNK</th>
<th>FIN</th>
<th>SWE</th>
<th>NAV</th>
</tr>
</thead>
<tbody>
<tr>
<td>milk kg</td>
<td>108</td>
<td>116</td>
<td>110</td>
<td>107</td>
</tr>
<tr>
<td>fat kg</td>
<td>107</td>
<td>121</td>
<td>112</td>
<td>108</td>
</tr>
<tr>
<td>protein kg</td>
<td>109</td>
<td>118</td>
<td>112</td>
<td>109</td>
</tr>
<tr>
<td>daughters</td>
<td>45411</td>
<td>1039</td>
<td>8134</td>
<td>54584</td>
</tr>
</tbody>
</table>
Genetic trend: HOL sires
Genetic trend: HOL cows
Genetic trend: Red breed sires
Genetic trend: Red breed cows
Conclusions

- Routine evaluation in use
- Results as expected
- Well received by
  - Farmers
  - A.I. companies

- Under work: inclusion of SWE TD records