GS breeding plan in practice

Internal Seminar
8. November 2011

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Breeding Goal

= NTM + variation in descent

Our main selection criteria is Nordic Total Merit (NTM) and variation in descent.
## Number of milk recorded cows

<table>
<thead>
<tr>
<th></th>
<th>Denmark</th>
<th>Sweden</th>
<th>Finland</th>
<th>In total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holstein</td>
<td>376,000</td>
<td>147,500</td>
<td>78,200</td>
<td>601,700</td>
</tr>
<tr>
<td>Jersey</td>
<td>65,000</td>
<td>2,000</td>
<td>-</td>
<td>67,000</td>
</tr>
<tr>
<td>VikingRed</td>
<td>38,500</td>
<td>122,000</td>
<td>147,200</td>
<td>307,700</td>
</tr>
<tr>
<td>Red Holstein</td>
<td>5,800</td>
<td>-</td>
<td>-</td>
<td>5,800</td>
</tr>
<tr>
<td>SKB/Finncattle</td>
<td>-</td>
<td>1,200</td>
<td>2,800</td>
<td>4,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>485,300</strong></td>
<td><strong>272,700</strong></td>
<td><strong>228,200</strong></td>
<td><strong>986,200</strong></td>
</tr>
</tbody>
</table>
Selection in Steps

Proven bull based on daughter information 5 years old

15-20/20-25/12-15
Put out as proven bulls based on genomic index 20 Months

175/200/55
Put out as young sires (1500-2000 doses)

Screening of all pregnancies

1.800/2.000/300
Choicen to genomic test

260/275/65
Bought based on Genomic values

Proven bull based on genomic index 20 Months

Elite Sires

VikGenetics
Numbers of bought, started & kept alive bulls

<table>
<thead>
<tr>
<th>Breed/months</th>
<th>0-11</th>
<th>12-24</th>
<th>25-36</th>
<th>37-48</th>
<th>49-60</th>
<th>61-72</th>
<th>73-84</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holstein incl red</td>
<td>257</td>
<td>180</td>
<td>160</td>
<td>130</td>
<td>100</td>
<td>45</td>
<td>15</td>
<td>630</td>
</tr>
<tr>
<td>Jersey</td>
<td>65</td>
<td>55</td>
<td>48</td>
<td>46</td>
<td>35</td>
<td>15</td>
<td>10</td>
<td>209</td>
</tr>
<tr>
<td>VikingRed</td>
<td>275</td>
<td>200</td>
<td>185</td>
<td>155</td>
<td>120</td>
<td>45</td>
<td>15</td>
<td>720</td>
</tr>
<tr>
<td>SKB</td>
<td>5</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Finn Cattle</td>
<td>6</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Beef</td>
<td>0</td>
<td>10</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Total</td>
<td>604</td>
<td>455</td>
<td>393</td>
<td>331</td>
<td>255</td>
<td>105</td>
<td>40</td>
<td>1579</td>
</tr>
</tbody>
</table>

0-11 months: Bought bulls (Enter our facilities at 4 months of age) = 410 bulls if equal distributed over the year
12-24 months: started as young bulls
Effect of using GS in our breeding.

- Higher genetic progress.

- Lower cost of rearing bulls
  - Number of bought Holstein reduced with nearly 50%.
  - Number of bought Jersey and VikingRed bulls not changed.

- More farmers involved in the breeding program

- Close to 60% of all Holstein semen sold in DNK is bulls without daughters.
Breeding scheme overview

Numbers from Holstein

- Base population: 600,000 cows
- Open nucleus: 12,000 females
- Ins recommendation: All bulls with GBV
- 175 bulls/year
- 75-125 ET recommendation
- 5,000 bull calves (pregnancies)
- 225-250 bulls
- App. 1,800 bulls tested
- All foreign bulls available
- Sires of sons
- All bulls with GBV
- 175 bulls/year
Jersey – Dam tested

Succesrate: 48% Selected !!!
Jersey – Dam not tested

Son NTM

Succesrate: 18% selected

Dam NTM
Ændringer på Holstein kvier efter typning

<table>
<thead>
<tr>
<th>Y-indeks</th>
<th>NTM</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; -20</td>
<td></td>
</tr>
<tr>
<td>-20 - -15</td>
<td></td>
</tr>
<tr>
<td>-15 - -10</td>
<td></td>
</tr>
<tr>
<td>-10 - -5</td>
<td></td>
</tr>
<tr>
<td>-5 - 0</td>
<td></td>
</tr>
<tr>
<td>0 - 5</td>
<td></td>
</tr>
<tr>
<td>5 - 10</td>
<td></td>
</tr>
<tr>
<td>&gt; 10</td>
<td></td>
</tr>
</tbody>
</table>
More knowledges needed!

- We have now the first bulls, where sire is a bull without daughter information. Should we treat these bulls different according to reliability?

- We select outcross bulls, but they need to deviate far from the sire index? What happens to the outcross effect?

- If we have a group of fullsibs -> Biggest difference in indicies also have the lowest relationship?

<table>
<thead>
<tr>
<th>NTM</th>
<th>Y</th>
<th>P</th>
<th>M</th>
<th>F</th>
<th>UH</th>
<th>OD</th>
<th>Mam</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>111</td>
<td>107</td>
<td>94</td>
<td>107</td>
<td>110</td>
<td>96</td>
<td>109</td>
</tr>
<tr>
<td>23</td>
<td>128</td>
<td>128</td>
<td>125</td>
<td>122</td>
<td>101</td>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td>22</td>
<td>124</td>
<td>124</td>
<td>118</td>
<td>118</td>
<td>99</td>
<td>86</td>
<td>105</td>
</tr>
</tbody>
</table>
More knowledges needed!

True best bulls is the bulls with a low GEBV but a high true breeding value?

Errors in is given to the son?

Outcross bulls have a lower reliability?

In Holstein we have more than 80 bulls available with NTM between 25 and 36. Which bulls to choose as sires of sons? The bulls with the highest heterozygosity?