New Calving Evaluations

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Background

• Calving evaluations are core component of EBI and Beef profit indexes
• Calving data used is 100% farmer recorded
• Industry needs a Dairy Beef index (DBI) with accurate calving evaluations on dairy animals
• DBI using current calving PTAs not suitable
• Opportunity to investigate:
  • Re-definition of the trait depending on targeted animal
  • New farmer recorded data such as birth size and calf vigour
Current approach

Dairy

Heifer

Cow

Single PTA and reliability calving difficulty

Heritability of 9%
Transformed to a % difficulty scale with a base of 6%

Beef

Heifer

Cow

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Issues with current evaluation

Reliability average 98.5%
Range: 96% to 99%

- Reliable for use on heifers??
- Reliable for use on dairy cows?
New approach

Dairy Heifer PTA

Beef Heifer PTA

Separate traits
4 traits
4 reliabilities

Relationship estimated between traits

Dairy Cow PTA

Beef Cow PTA

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New traits

• Birth size \((n = 1,602,347)\)
  • Recorded by Suckler farmers in BDGP program
  • 5 point scale XS, S, M, L, XL

• Birth weight \((n = 277,862)\)
  • Actual recorded (98%)
  • Predicted from birth measurements (2%)
    • Chest width, height at shoulder
Data edits

- Sire known
- Parity 1 to 15, min heifer age of 20 months
- Calving 1 to 4, Birth weight 20-115 kg
- Censored records:
  - ET births
  - Malpresentation
  - WHPR evidence of C-section in conflict with score
- Variation in the herd for each trait in a seasonal 3 month window
Trait phenotypic distribution

![Graph showing phenotypic distribution of birth weight. The x-axis represents birth weight, and the y-axis represents percent. The graph shows a distribution with a peak at around 34.8 on the x-axis, indicating a higher concentration of births at that weight.]

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Genetic parameters for new traits

<table>
<thead>
<tr>
<th>Trait</th>
<th>DairyHeifer</th>
<th>Dairy Cow</th>
<th>Beef Heifer</th>
<th>Beef Cow</th>
<th>Birth size</th>
<th>Birth weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>DairyHeifer</td>
<td>16%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dairy Cow</td>
<td>0.91</td>
<td>8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Beef Heifer</td>
<td>0.80</td>
<td>0.78</td>
<td>17%</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Beef cow</td>
<td>0.62</td>
<td>0.59</td>
<td>0.94</td>
<td>15%</td>
<td></td>
<td></td>
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<tr>
<td>Birth size</td>
<td>0.82</td>
<td>0.74</td>
<td>0.88</td>
<td>0.85</td>
<td>24%</td>
<td></td>
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<tr>
<td>Birth weight</td>
<td>0.63</td>
<td>0.64</td>
<td>0.64</td>
<td>0.62</td>
<td>0.52</td>
<td>41%</td>
</tr>
</tbody>
</table>

- Different heritability
- Strong heifer cow correlation dairy and beef
- Correlations not as strong across dairy and beef
- Birth size is a good predictor trait
Validation

• 2018 born animals
• Phenotype omitted and Parental Average calculated

<table>
<thead>
<tr>
<th>Validation</th>
<th>N</th>
<th>EBV current</th>
<th>Ebv new</th>
<th>% increase</th>
<th>EBV current</th>
<th>Ebv new</th>
</tr>
</thead>
<tbody>
<tr>
<td>DH</td>
<td>84,981</td>
<td>0.18</td>
<td>0.23</td>
<td>28%</td>
<td>1.67</td>
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<tr>
<td>DC</td>
<td>302,698</td>
<td>0.21</td>
<td>0.23</td>
<td>10%</td>
<td>1.23</td>
<td>0.94</td>
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<tr>
<td>BH</td>
<td>21,013</td>
<td>0.2</td>
<td>0.21</td>
<td>5%</td>
<td>1.7</td>
<td>0.91</td>
</tr>
<tr>
<td>BC</td>
<td>114,091</td>
<td>0.2</td>
<td>0.21</td>
<td>5%</td>
<td>1.11</td>
<td>0.85</td>
</tr>
</tbody>
</table>

• New evaluations are better at predicting phenotype
• More pronounced for dairy herd calvings
• Existing calving evaluation not predicting extent of difficulty in heifers
Calving difficulty pta breed averages

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Breed variance by trait

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Genetic Trends: Pedigree animals

Dairy Heifer

Dairy Cow

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Genetic Trends: Pedigree animals

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Current status

- Genetic parameters
- EBVs and reliabilities
- Tested in new DBI
- TAG and ICBF board approval for use in DBI
- Implementation meeting on publication
- Foreign ebvs and genomics
- Impact of inclusion in EBI and €uro-stars
- TAG approval, education and rollout
- Changes: bull search, profiles, reports, sire advice
- Target full integration, Autumn 2019

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Conclusions

• Targeted calving evaluations more accurate than single all encompassing trait
• New evaluations suitable for DBI
• Calf birth size a very useful predictor trait
  ➢ Rollout to dairy farmers
• Significant educational challenge ahead of full rollout
  ➢ Beef sires with potential 4 calving PTAs