IMPROVING HERDS

Using genomics to improve heifer selection decisions
Herd decisions made easy

• Improving Herds is a demonstration project to accelerate the rate of genetic gain in dairy cows and drive farm business profitability in Australia

• Aiming to turn research into simple, data-driven decisions to deliver profits to farmers
Genomics in Australia

- Genomic breeding values or ABV(g)s available since 2011
- Commercial genotyping taking off
  - Increased by 38% in females over 12 mths
- How much is genotyping worth to farm businesses?
ImProving Herds

• Deterministic model to value genomic testing optimised for pasture-based systems
  – Customisable cost-benefit calculator
  – With and without sexed semen
  

• Validation in Genetic Focus farms
Genetic Focus Farms in every region

- 27 Genetic Focus Farms
- Each farm
  - Herd records
  - Financial data
  - Genomic testing of heifers
Validating genomics
## Average reliability of ABVs and ABV(g)s

<table>
<thead>
<tr>
<th>Trait</th>
<th>Young heifer parent average ABV</th>
<th>Genotyped young heifer ABV(g)</th>
<th>7th lactation cow ABV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein kg</td>
<td>32</td>
<td>74</td>
<td>77</td>
</tr>
<tr>
<td>Overall type</td>
<td>21</td>
<td>54</td>
<td>29</td>
</tr>
<tr>
<td>Longevity</td>
<td>23</td>
<td>50</td>
<td>33</td>
</tr>
<tr>
<td>Fertility</td>
<td>24</td>
<td>50</td>
<td>38</td>
</tr>
</tbody>
</table>

Source: DataGene 2016
What’s the relationship between ABV(g)s and performance?

- Reliability ~ 70%

\[ R^2(\text{production phenotypes}, \text{ABV(g)s}) \sim 70\% \]
Split into 2 groups on genomic BPI

Bottom 25% - sell

Top 75% - keep

24 kg more milk-solids

+12.8 kg fat
+ 11.1 kg protein
ImProving Herds an Australian dairy initiative

100 heifer calves

$5,000 to genotype

75 herd replacements chosen:
Fat: 12.8kg x $1.79 = $2279.6
Protein: 11.1kg x $6.92 = $756.32
Total: $2279.6 + $756.32 = $3035.92

Net benefit ($33/heifer kept):
$7453 - $5000 = $2452

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Net benefit ($33/heifer kept)
ImProving Herds an Australian dairy initiative

100 heifer calves

$5,000 to genotype

75 herd replacements chosen:

Fat: \(4.26 \text{ kg} \times 1.79\) = $1284

Protein: \(1.37 \text{ kg} \times 6.92\) = $926

$2452 - $1284 = $1168

Advantage of genotyping versus using sire EBVs

Use Sire BPI instead
Mating choices
Who is your Mum and Dad?
Genomics performed as expected

• ImProving Herds demonstrated that
  – the first lactation performance of cows in 27 herds was consistent with their genomic testing results
  – farmers can make future herd decisions early in a calf’s life
ImProving Herds project team
Special thanks

- Erika Oakes
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- Jo Newton
- Ben Hayes
Thank You