Definition of breeding goals for dairy breeds in organic production systems

Quantification of organic preferences

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Aim

Investigate whether organic farmers prefer another weighting of traits in the breeding goal than calculated from an economic model.
Including organic preferences

Weight in breeding goal = Economic value + Organic preferences

Economic model (Simherd)  This study = survey organic farmers
Why survey to organic farmers?

• Economic models don’t account for everything
  – Organic principles

• Create ownership
  – Ensure the breeding goal reflects farmers’ requirements
The survey

• Web based contact via e-mail
  – General questions
  – Breeding goal
    • 1000Minds.com

• 161 farmers responded (51 % of total)
  – Danish Holstein: 106
  – Red Dairy Cattle: 29
  – Danish Jersey: 26
Questionnaire – breeding goal

• Pairwise comparison of two alternatives

Which of two alternatives do you prefer?

(Given they are identical in all other aspects)

Milk production
+38 kg ECM per 305 days lactation

Mastitis
As in your herd today

Milk production
As in your herd today

Mastitis
5.3 fewer cases per 100 cows

this one  OR  this one

they are equal
### Changes have same economic value

<table>
<thead>
<tr>
<th>Trait</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed efficiency</td>
<td>0.010 kg ECM per feed unit</td>
</tr>
<tr>
<td>Milk production</td>
<td>38 kg ECM per 305 days lactation</td>
</tr>
<tr>
<td>Fertility, cows</td>
<td>39 Additional pregnancies per 100 inseminations</td>
</tr>
<tr>
<td>Fertility, heifers</td>
<td>11 Additional pregnancies per 100 inseminations</td>
</tr>
<tr>
<td>Calving difficulty</td>
<td>-8.2 Cases per 100 cows</td>
</tr>
<tr>
<td>Mastitis</td>
<td>-5.3 Cases per 100 cows</td>
</tr>
<tr>
<td>Diseases besides mastitis</td>
<td>-10.1 Cases per 100 cows</td>
</tr>
<tr>
<td>Leg and claw diseases</td>
<td>-13.5 Cases per 100 cows</td>
</tr>
<tr>
<td>Calf mortality</td>
<td>-12 Dead heifer calves per 100 cows</td>
</tr>
<tr>
<td>Cow mortality</td>
<td>-1.8 Cases per 100 cows years</td>
</tr>
</tbody>
</table>

Prioritizing all traits equally = no changes in economic values
## Organic preferences

### higher weight

<table>
<thead>
<tr>
<th>Metric</th>
<th>Preference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fertility, cows</td>
<td>+24%</td>
</tr>
<tr>
<td><strong>Milk production</strong></td>
<td><strong>+20%</strong></td>
</tr>
<tr>
<td>Calf mortality</td>
<td>+14%</td>
</tr>
<tr>
<td>Mastitis</td>
<td>+10%</td>
</tr>
</tbody>
</table>

\[
\text{Weight in breeding goal} = \text{Economic value} + \text{Organic preferences}
\]

\[
954 = 797 + 157 \ (20\%)
\]
Organic preferences
lower weight

<table>
<thead>
<tr>
<th>Condition</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calving difficulty</td>
<td>-40%</td>
</tr>
<tr>
<td>Cow mortality</td>
<td>-17%</td>
</tr>
<tr>
<td>Diseases besides mastitis</td>
<td>-9%</td>
</tr>
</tbody>
</table>
Organic preferences
same weight

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Leg and claw diseases</td>
<td>-1.0%</td>
</tr>
<tr>
<td>Feed efficiency</td>
<td>0.1%</td>
</tr>
<tr>
<td>Fertility, heifers</td>
<td>0.1%</td>
</tr>
</tbody>
</table>
Ranking of traits

- Calving difficulty
- Milk production
- Fertility, Cows
- Feed efficiency
- Fertility, Heifers
- Leg and claw diseases
- Other diseases
- Calf mortality
- Cow mortality
- Mastitis
- Other diseases

Rankings:
- Fertility, Cows: a
- Milk production: ab
- Calf mortality: ab
- Mastitis: abc
- Feed efficiency: abcd
- Fertility, Heifers: bcd
- Leg and claw diseases: bcd
- Other diseases: cd
- Cow mortality: d
- Calving difficulty: e
Summary of results

• Higher weights for cow fertility, calf mortality, mastitis and milk production

• Lower weights for calving difficulty, cow mortality and diseases besides mastitis

• Large heterogeneity among farmers
Further work

• Do answers represent a specific organic perspective?
  – Survey to all conventional farmers is initiated

• Investigate the consequences of chosen strategy

• Effect on genetic gain and rate of inbreeding for different breeding goals will be investigated in simulation studies
  – Survey
  – Organic principles

• Dialogue with farmers
Conclusion

Do organic farmers prefer another weighting of traits in the breeding goal than calculated from an economic model?

Yes

Large changes in weights due to organic preferences