True Pregnancy Rate of Heifers and Optimal Raising Patterns

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Curso avançado sobre Ferramentas para Tomada de Decisão em Fazendas Leiteiras, 10 Setembro 2013.
Rationale
Study heifers’ calving patterns

True reflection of pregnancy speed
Includes indirectly:
• Abortion
• Service rate
• Conception rate

Does not include
Heifers not becoming pregnant (<5%)

Distribution is very important
How wide or tied is the calving distribution

Goals are important
Should reflect local standards
Heifer pregnancy rate
A flexible online tool (or spreadsheet)

Additional indices
- Economic
- Environmental

Goals comparisons

Distributions
Heifer pregnancy rate
How to use it?

Use the “data entry spreadsheet” template

What do you need?
• Heifer ID
• AFC = Age at first
Heifer pregnancy rate
Statistics summary

Average AFC
Important, but not the only one

Goals
Based on long experience, mostly in Wisconsin

<table>
<thead>
<tr>
<th>Statistics Summary</th>
<th>Your Herd</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average age @ first calving, mo</td>
<td>27.8</td>
<td>23-24 mo</td>
</tr>
<tr>
<td>Minimum calving age, mo</td>
<td>22</td>
<td>n/a</td>
</tr>
<tr>
<td>Maximum calving age, mo</td>
<td>36</td>
<td>n/a</td>
</tr>
<tr>
<td>Heifers calving/year, n</td>
<td>100</td>
<td>n/a</td>
</tr>
<tr>
<td>Calving age deviation, mo</td>
<td>2.6</td>
<td>&lt;1.7 mo</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>1.3</td>
<td>n/a</td>
</tr>
<tr>
<td>Skewness</td>
<td>0.8</td>
<td>&gt; 1.5</td>
</tr>
</tbody>
</table>
Heifer pregnancy rate
Most typical measurements and variance

Spread of calving
Better when less sparse

<table>
<thead>
<tr>
<th>Range and Variance</th>
<th>Your Herd</th>
<th>Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youngest calving age (typical), mo</td>
<td>23.6</td>
<td>&gt; 21 mo</td>
</tr>
<tr>
<td>Oldest calving age (typical), mo</td>
<td>33.4</td>
<td>&lt; 28 mo</td>
</tr>
<tr>
<td>Calving age range (typical), mo</td>
<td>9.8</td>
<td>&lt; 6.0</td>
</tr>
<tr>
<td>Days on feed variance, d</td>
<td>299.9</td>
<td>&lt; 200</td>
</tr>
<tr>
<td>Calving body weight variance, lbs</td>
<td>0</td>
<td>&lt; 325</td>
</tr>
</tbody>
</table>
Heifer pregnancy rate
Measurements and variance

True pregnancy
Speed at which heifers become pregnant monthly

<table>
<thead>
<tr>
<th>Breeding Efficiency</th>
<th>Your Herd</th>
<th>Goals</th>
</tr>
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<tbody>
<tr>
<td>True heifer pregnancy rate©, %/mo</td>
<td>26</td>
<td>&gt; 42.5</td>
</tr>
<tr>
<td>Average pregnancy age, mo</td>
<td>18.8</td>
<td>14.0-14.5</td>
</tr>
<tr>
<td>First (start) breeding age, mo</td>
<td>15.1</td>
<td>12.5-13.0</td>
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Heifer pregnancy rate
Measurements and variance

Excess rearing days
Deviation from goal
Potential savings

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<th>Rearing Cost</th>
<th>Your Herd</th>
<th>Goals</th>
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<tr>
<td>Excess rearing days, days/heifer</td>
<td>94.8</td>
<td>0 days</td>
</tr>
<tr>
<td>Excess rearing cost, $/heifer</td>
<td>213.2</td>
<td>$0</td>
</tr>
<tr>
<td>Excess herd rearing days, days/herd</td>
<td>9477.5</td>
<td>0 days</td>
</tr>
<tr>
<td>Excess rearing cost, $/herd</td>
<td>21324.5</td>
<td>$0</td>
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Heifer pregnancy rate
Measurements and variance

Excess manure and P
Deviation from goal
Potential decrease in environmental impacts

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<th>Nutrient Management</th>
<th>Your Herd</th>
<th>Goals</th>
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<td>Excess manure production, tons/year</td>
<td>118.5</td>
<td>0 tons</td>
</tr>
<tr>
<td>Excess P production, lbs/year</td>
<td>497.6</td>
<td>0 lbs</td>
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Heifer pregnancy rate
Measurements and variance

Excess manure and P
Deviation from goal
Potential decrease in environmental impacts

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Heifer pregnancy rate
Distributions

Calving distribution
Tight better
Right skewed
Heifer pregnancy rate

Distributions

Survival curve

Tighter better

Early start
Application to herds in Wisconsin
Efficient heifer farm

Average AFC
very sparse

True pregnancy
Late start
Not effective

Opportunities!
Economics
Environmental
**Application to herds in Wisconsin**

**Efficient heifer farm**

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### Average AFC

**Fairly sparse**

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### True pregnancy

**Early start**

**Not effective**

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**Opportunities!**

**Economics**

**Environmental**
Application to herds in Wisconsin

Efficient heifer farm

Average AFC
Nicely distributed

True pregnancy
Early start
Very effective

Optimal
Economics
Environmental
30 herds in Wisconsin
Age at first calving

8/30 (27%)
Herd that are
23 < AFC < 24
30 herds in Wisconsin

True pregnancy rate

4/30 (13%)

Herd that are

> 42.5%
30 herds in Wisconsin
Start breeding month

13/30 (43%)
Herds between 12.5-13.0 mo
30 herds in Wisconsin
Excess rearing cost

2/30 (7%)
Herds with
$0 extra rearing