Does moment 1st insemination represent moment 1st heat?

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Animal Evaluation Unit

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Content

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Introduction

• Importance of estrus detection

• Usability of information for breeding values

• What is Ovalert ®?
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• The activity (leg or neck movement) of the individual cow is measured and registered in periods of two hours

• The measured activity is compared with two hour data, collected during previous days

• Is the measured activity over several periods significantly higher?
  – Farmer receives an alert
Material and method

• Data recorded between 22-01-2011 and 23-11-2012 (n=12,081)

• Information about:
  – Moment of calving
  – Moment of first estrus detection
  – Interval calving to first estrus detection (HEAT)
  – Interval calving to first insemination (ICI)
Material and method

• Increase because more farmers started using Ovalert®
• Last months showed a decline: not all data of those months were available at the moment the dataset was created
Material and method
Material and method

- Average of 55 days
Material and method

- Average of 78 days
Material and method

![Bar chart showing observations per parity](chart.png)
Material and method

• First ovulation expected more than 14 days after calving, therefore:
  – Records with HEAT of ≤ 14 days removed from dataset (n=967)
  – Records with ICI of ≤ 14 days not included in the estimations (n=5)

• HEAT records from > 150 days were set to 150 days to reduce the effect of extreme values on the genetic parameter estimations (n=166)
Material and method

- Heritabilities and genetic correlation estimated in ASReml

\[
\text{HEAT} = \text{parity}_i + \text{herd}_j + \text{calf\_season}_k + \text{animal}_l + \epsilon_{ijkl}
\]

\[
\text{ICI} = \text{herd}_j + \text{calf\_season}_k + \text{animal}_l + \epsilon_{jkl}
\]

Where,

- \( \text{parity}_i \) = parity of the cow
- \( \text{herd}_j \) = herd number of the cow
- \( \text{calf\_season}_k \) = year.month of calving
- \( \text{animal}_l \) = animal
- \( \epsilon_{ijkl} \) = residual
Results

- Genetic correlation between HEAT and ICI of 0.95 (se = 0.06)

<table>
<thead>
<tr>
<th>Trait</th>
<th>$h^2$</th>
<th>SE</th>
<th>SD (days)</th>
<th>Number of records</th>
</tr>
</thead>
<tbody>
<tr>
<td>HEAT</td>
<td>0.06</td>
<td>0.016</td>
<td>6.63</td>
<td>11,114</td>
</tr>
<tr>
<td>HEAT - par1</td>
<td>0.07</td>
<td>0.017</td>
<td>7.30</td>
<td>3,191</td>
</tr>
<tr>
<td>HEAT - par2</td>
<td>0.07</td>
<td>0.017</td>
<td>7.32</td>
<td>3,018</td>
</tr>
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<td>HEAT - par3</td>
<td>0.07</td>
<td>0.017</td>
<td>7.50</td>
<td>2,204</td>
</tr>
<tr>
<td>ICI</td>
<td>0.10</td>
<td>0.024</td>
<td>8.24</td>
<td>11,114</td>
</tr>
</tbody>
</table>
Conclusion

• Heritability:
  – HEAT 0.06
  – ICI 0.10

• St.dev. 7-8 days

• High genetic correlation between first heat and first insemination
Does moment 1\textsuperscript{st} insemination represent moment 1\textsuperscript{st} heat?

YES