Cows can’t talk, but we can listen (to their rumination)

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The problem of dairy size and modern dairy farming
Objective Data- A Key to Management

If you can’t measure it, you can’t manage it…

Can you afford not to know?
The HR-Tag™

- Unique cow motion sensor (three-dimensional acceleration meter).
- Built-in microphone records and analyzes rumination.
- Filters head movements.
- Easy and secure attachment.
- Separate data storage in 2 hour intervals.
- 8 year lifetime with 6 year graduated warranty.
Clear activity peak indication using STD (standard deviation) based algorithm.

Heats determined through the analysis of a minimum of FOUR 2 hour segments.

Variable viewing resolution.

Raw data viewing option.

Graph peak correlates with standing heat.
### Table 1: Cox Proportional Hazards model stratified by herd

<table>
<thead>
<tr>
<th>Herd</th>
<th>Bred</th>
<th>Pen</th>
<th>N&lt;sup&gt;1&lt;/sup&gt;</th>
<th>%&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Median time to pregnancy (days) and 95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Once</td>
<td>AHD</td>
<td>313</td>
<td>69</td>
<td>151 (124 - 189)</td>
<td>0.52</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TAI</td>
<td>495</td>
<td>49</td>
<td>136 (114 - 162)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Twice</td>
<td>AHD</td>
<td>240</td>
<td>63</td>
<td>119 (105 - 139)</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TAI</td>
<td>389</td>
<td>72</td>
<td>146 (125 - 174)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Twice</td>
<td>AHD</td>
<td>249</td>
<td>61</td>
<td>99 (87 - 122)</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TAI</td>
<td>299</td>
<td>55</td>
<td>124 (108 - 147)</td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup>Number of breedings within each pen  
<sup>2</sup>Proportion of AI to the assigned protocol
Heatime® detects “real” heats and recommends the correct timing for insemination

University of Wisconsin

• For the 42 cows included in the analysis, 26% (11/42) underwent luteal regression but did not ovulate (2 were detected in estrus by Heatime; HDR=18%), whereas 74% (31/42) regressed their CL and ovulated (28 were detected in estrus by Heatime; HDR=90%).

• We conclude that the Heatime system determined the correct timing of AI for most of the cows that displayed estrus and that treatment with GnRH at the time of AI determined by the Heatime system did not affect fertility in lactating dairy cows.
Heatime® With Rumination Monitoring

The Only Comprehensive Cow Status Monitoring Solution in the Market Today
HR Tags- Heatime® With Rumination Monitoring

It Works!!!

R² = 0.87, n = 51, P< 0.001

Schirmann et al.; J. Dairy Sci. 92 :6052–6055
# HR Tags- Heatime® With Rumination Monitoring

Changes in Rumination Time on Day of Specific Events

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Dry period</th>
<th>Calving</th>
<th>Heat</th>
<th>Trim Date</th>
<th>Heat stress</th>
<th>mastitis</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Dry</td>
<td>Close-up</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># cows or # events</td>
<td>75</td>
<td>72</td>
<td>75</td>
<td>199</td>
<td>98</td>
<td>671</td>
</tr>
<tr>
<td>Change in rumination</td>
<td>-43</td>
<td>-66</td>
<td>-255</td>
<td>-75</td>
<td>-39</td>
<td>-20</td>
</tr>
<tr>
<td>SE</td>
<td>1.93</td>
<td>2.50</td>
<td>10.4</td>
<td>6.19</td>
<td>8.77</td>
<td>3.40</td>
</tr>
<tr>
<td>P</td>
<td>For all parameters, P&lt;0.0001</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Value represents change in rumination (LSM), in comparison to the standard lactation value of 478 minutes/day
Feeding rate decreased in both treatments by 10% after regrouping. Rumination times also decreased by approximately 9% in both treatments... No changes were observed in daily lying time after regrouping in either treatment...
HR Tags- Heatime® With Rumination Monitoring

Additional confirmation of a cow in heat.
The results of the present study provide a new insight in which rumination time plays a pivotal role in the negative effect of heat stress on DMI and, consequently, on milk production.
HR Tags- Heatime® With Rumination Monitoring

Effective monitoring of veterinarian treatment effectiveness.

Effective Treatment  Ineffective Treatment
HR Tags- Heatime® With Rumination Monitoring

Post partum monitoring.

![Graph showing rumination monitoring over days after calving]

- Healthy
- Light ketosis or metritis
- Moderate metritis or ketosis
- Displaced abomasum

Fresh Cow Monitoring
HR Tags- Heatime® With Rumination Monitoring

Rumination sensitivity to nutritional changes.

After calving groups were fed different rations (same fiber content, but from different sources)

HR Tags- Heatime® With Rumination Monitoring

Rumination sensitivity to nutritional changes.

Herd Average Daily Rumination

[Graph showing daily rumination minutes with annotations for TMR Change, Drop in Milk Production, and Return to old Ration]

Cow Group Monitoring
Task oriented User Interface

- COWS IN HEAT 3
- TECH. ALERTS 2
- COWS W/O ID 10
- HEALTH REPORT 3
- TOTAL COWS 68

- REPORTS
- OPTIONS
- COW SEARCH

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PRECISE DAIRY FARMING
Summary

- Technology enables the dairy farmer to “feel the pulse” of every cow in the dairy 24/7, independent of herd size.
- Rumination is an ideal “wellbeing” indicator because it is the sum of what and how much the cow has eaten, and how well she could rest.