Heat Detection in the Dairy Herd

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Improving Reproductive Efficiency

- Shortening Post-partum interval
  - ↑ Submission Rates
    - ~ Heat Detection
  - ↑ Conception Rates
The Effect of Different Heat Detection and Conception Rate on % of Herd Pregnant at 90 Days After Onset of Breeding Season

<table>
<thead>
<tr>
<th>Heat Detection Rate %</th>
<th>Conception rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>60</td>
</tr>
<tr>
<td>90</td>
<td>96</td>
</tr>
<tr>
<td>70</td>
<td>91</td>
</tr>
<tr>
<td>50</td>
<td>76</td>
</tr>
<tr>
<td>40</td>
<td>67</td>
</tr>
</tbody>
</table>
How much AI should I use in my herd?

- Culling rates
- Expansion plans
- The % of heifer calves that makes it through to completion of 1st lactation (75-80%).
- Herd conception rate.
- Vagaries in the proportion of heifer calves born – particularly important in small herds.
No of straws required to produce a lactating heifer replacement

<table>
<thead>
<tr>
<th>Herd CR</th>
<th>No Straws</th>
<th>20 Replacements</th>
</tr>
</thead>
<tbody>
<tr>
<td>40%</td>
<td>6.22</td>
<td>140</td>
</tr>
<tr>
<td>50%</td>
<td>4.98</td>
<td>110</td>
</tr>
<tr>
<td>60%</td>
<td>4.15</td>
<td>96</td>
</tr>
<tr>
<td>70%</td>
<td>3.55</td>
<td>80</td>
</tr>
</tbody>
</table>
Primary Sign of Heat
Secondary Signs of Heat

- Sliming
- Restlessness
- Mounting activity
- Trailing other cows
- Bellowing
- Mounting or dirt marks
- Skin Marks
- Met-oestrous bleeding
Coming into heat
6-24 hours

Standing Heat
average 9 hours
range 3-30 hours

Going out of
up to 24 hours

Stands to be mounted

Increase walking, bellowing and general restlessness

Chin pressing

Swelling of vulva & mucus discharge

Dirt and skin marks

Mounts other cows

Bloody Discharge

Optimum Fertility

Conception rate
70%
50%
30%

Ovulation

Fertile Life of Sperm up to 36 hours
Mucous vaginal discharge
Chin resting
Factors Affecting Expression of Heat

- Hormonal: Oestradiol & Progesterone
- Milk Production: Less in High-Producing Cows
- Environment & size of Sexually Active Group.
- Lameness
Lame Cows

- Reduced Expression of Heat
- Delayed Ovulation or Ovulation Failure
Underfoot surface on no mounts received during heat

Under-Foot Surface

<table>
<thead>
<tr>
<th>No. Mounts</th>
<th>Slats</th>
<th>Straw</th>
<th>Pasture</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>14</td>
<td>23</td>
<td>38</td>
</tr>
</tbody>
</table>

Under-Foot Surface
No of animals in heat simultaneously on number of mounts received during heat

<table>
<thead>
<tr>
<th>Number in heat simultaneously</th>
<th>No. in heat simultaneously</th>
<th>No. Mounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>17</td>
<td>17</td>
</tr>
<tr>
<td>2</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>3+</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>
Effect of underfoot surface on duration of heat

- Slats: 8.6 hours
- Straw: 12.4 hours
- Pasture: 14.1 hours
Effect of no. of animals in heat simultaneously on duration of heat

Duration of heat (hours)

1  2  3+
No. on heat simultaneously

8.9  12.2  13.7
# Pattern of heat Onset

<table>
<thead>
<tr>
<th>% of cows first observed at</th>
<th>7:00</th>
<th>10:00</th>
<th>13:00</th>
<th>16:00</th>
<th>23:00</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>47%</td>
<td>5%</td>
<td>5%</td>
<td>20%</td>
<td>20%</td>
</tr>
</tbody>
</table>
Aids to improve heat detection rate

- Tail paint
- Teaser Bull
- Synchronisation (Heifers)
- *New technological aids*
- Oestrous Alert patches
- Kamars
- Pedometers
Teaser Bulls

- Use yearling bull
- Vasectomise at least 6 weeks before intended use *(do it now)*
- Fit with chin-ball 2-3 weeks before introduction to herd
- Castrate or sell at end of breeding season
Self-Adhesive, Highly Visible

A single mounting.

After 3-5 mountings.

More than 5 mountings.
Components of a Good Heat Detection Plan

- Commitment
- Understanding signs of heat
- Good recording and constant monitoring
- Use at least one Aid to Heat Detection
- Breed replacement heifers to dairy AI sires
- Judicious use of synchronisation treatments ~ heifers, “problem” & late calving cows
New Heat Detection Technologies

- Kamars (some good reports)

Integrated systems: Pedometers and inline sensors
Oestrous /Ovulation Control regimens

Oestradiol Benzoate (ODB) no longer available

Prostaglandin (PG) -based systems
- ~ Heifers
- Fertility: Normal 60-70%

Progesterone + GnRH + PG (PRIDs & CIDRs)
- ~ individual cows + anoestrous cows
- Fertility: Variable but generally low

Ovsynch or modified Ovsynch
- Herd or individual cow application
- Fertility: 10% below breeding at spontaneous heat
Detect oestrous for 5-6 days

Oestrus detection and AI for 5 days

PG to “non-responders"

Day 5

PG

Oestrus detection and AI for 5 days

PG to “non-AI’ed”

Day 17

PG

Alternative prostaglandin regimen
<table>
<thead>
<tr>
<th></th>
<th>2PG + Fixed Time AI @48 &amp; 72 hours</th>
<th>HD for 6 days &amp; PG and HD</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No Heifers</strong></td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td><strong>Vet costs</strong></td>
<td>120</td>
<td>60</td>
</tr>
<tr>
<td><strong>Drug costs</strong></td>
<td>160</td>
<td>56</td>
</tr>
<tr>
<td><strong>Semen (10)</strong></td>
<td>400</td>
<td>180</td>
</tr>
<tr>
<td><strong>AI</strong></td>
<td>400 (€1080)</td>
<td>360 (€656)</td>
</tr>
<tr>
<td>no calves</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td><strong>No Heifer calves</strong></td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td><strong>Cost per heifer Calf</strong></td>
<td>180</td>
<td>109</td>
</tr>
<tr>
<td><strong>Repeat AI</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Semen</strong></td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>no calves</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>No Heifer Calves</strong></td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>Cost per heifer calf</strong></td>
<td>143</td>
<td>90</td>
</tr>
</tbody>
</table>
Summary

- 90% of heifers bred in 10-11 days
- Good fertility, calving rates of 60-70%.
- Minimizes drug usage
- Minimizes semen usage
- Minimizes veterinary visits
Heat Detection Plan

- Day - 42: Prepare Teaser bull(s)
- Day - 42: Calculate number of dairy AI straws required & order
- Day -21: Tail paint all cows & heifers and commence twice daily heat detection & recording
- Re-paint cows & heifers once weekly
- Day 0: Commence Trice daily (30 minutes each time) heat detection of cows and replacement heifers. (Place teaser bull with heifers ?)
- AI all cows and heifers observed in heat or with clear evidence of tail paint removed. Re-paint cows once weekly
- Only use dairy AI straws

Note: “Heat Detection patches” or “Kamars” can be used instead of Tail paint.
Heat Detection Plan – Cont.

- Review list of cows calved 42 days and not recorded in heat during 3 weeks pre-breeding. Treat if necessary.

- Day 6: Administer PG to heifers not yet AI’ed

- Day 21: Calculate 21-day submission rate. Identify cows & heifers calved 42+ days and not yet AI’ed. Treat as necessary

- Day 28: Place Teaser bull(s) with cows.

- Day 42: Review heat detection/submission rates to date. Identify cows & heifers calved 42+ days and not yet AI’ed. Treat as necessary

- Continue using dairy AI until required number of dairy AI straws is used.

Note: “Heat Detection patches” or “Kamars” can be used instead. Tail paint