Impact of timed AI use on reproductive performance and culling rate in WI dairy herds

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Rationale: impact of timed AI on breeding routine

AI following estrus

AI following Timed AI
Timed AI (TAI) have changed reproductive management in most WI herds. However, information reporting the pattern of use of TAI and its impact at herd level is lacking.

**RATIONALE**

To examine the use and impact of TAI on reproductive performance and culling rates in dairy herds in Wisconsin-USA.
HYPOTHESIS

The hypothesis was that herds using TAI more intensively would have improved reproductive performance and lower culling rates in late lactation (association, not cause-effect)
MATERIAL and METHODS

- DC 305 backups from 200 confined herds were manually collected from 2009 to 2012.

- Only herds with complete breeding records from last 12 months prior to backup date were used.

- Within herd, inseminations associated to TAI were assessed by recorded breeding codes in DC305 and confirmed with respective distribution of breeding codes by day of the week.

- Average lactating cows per herd was 660 (51-7,273) and 305ME production was 12,427kg (9,476-16,112)
MATERIAL and METHODS

- Herds divided into quartiles of TAI use intensity:
  - Q1: 0-36%
  - Q2: 37-55%
  - Q3: 56-69%
  - Q4: 67-99%

- SR, CR, PR: bredsum in DC305

- Culling rate: number cows sold + dead over 12 months divided by the average number of cows in the herd during same period

- Late cullings (>330 DIM)
Outline of results

- Use of timed AI – herd level
- Impact of TAI on CR, SR, and PR
- Impact of TAI and PR on cull rate
Results: TAI overall and by herd size

- 91% of herds had ≥ 10% of their AIs associated to TAI
- Across herds averaged 52% of all AIs
Results: TAI by milk production

- Total AIs performed with timed AI (%)
- Total AIs performed with timed AI (%)
- r = 0.40
- P < 0.01

305 milk production (kg)

- 10000
- 11000
- 12000
- 13000
- 14000
- 15000
- 16000

r = 0.40

P < 0.01
Results: TAI and voluntary waiting period and interbreeding interval

- TAI and voluntary waiting period
- Interbreeding interval

- $r = 0.58$, $P < 0.05$
- $r = 0.26$, $P < 0.07$
Outline of results

- Use of timed AI – herd level
- Impact of TAI on CR, SR, and PR
- Impact of TAI and PR on cull rate
Results: Timed AI on SR

Proportion of herds with SR > 50%

Q1  Q2  Q3  Q4

0% to 36%  37% to 55%  56% to 69%  67% to 99%

Proportion of breedings following a timed AI protocol

- Q1: 50% (a)
- Q2: 60% (ab)
- Q3: 84% (bc)
- Q4: 92% (c)
Results: Timed AI on CR

Proportion of breedings following a timed AI protocol
Results: Timed AI on PR

Proportion of breedings following a timed AI protocol

<table>
<thead>
<tr>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
</tr>
</thead>
<tbody>
<tr>
<td>0% to 36%</td>
<td>37% to 55%</td>
<td>56% to 69%</td>
<td>67% to 99%</td>
</tr>
<tr>
<td></td>
<td>0% to 36%</td>
<td>37% to 55%</td>
<td>56% to 69%</td>
</tr>
<tr>
<td></td>
<td>24%</td>
<td>40%</td>
<td>42%</td>
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</table>

Proportion of herds with PR >18%
Outline of results

- Use of timed AI – herd level
- Impact of TAI on CR, SR, and PR
- Impact of TAI and PR on cull rate
Results: Impact of TAI on culling rate

- Herds with culling rate >30%
- Herds with late (>330 DIM) culling > 30% of total culls

<table>
<thead>
<tr>
<th>Quartile</th>
<th>0% to 36%</th>
<th>37% to 55%</th>
<th>56% to 69%</th>
<th>70% to 99%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>55%</td>
<td>33%</td>
<td>66%</td>
<td>60%</td>
</tr>
<tr>
<td>Q2</td>
<td></td>
<td>24%</td>
<td>60%</td>
<td>64%</td>
</tr>
<tr>
<td>Q3</td>
<td></td>
<td></td>
<td>30%</td>
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<tr>
<td>Q4</td>
<td></td>
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<td>24%</td>
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Results: Impact of PR on culling

Herds with culling rate >30%

- Pregnancy rate class (%)
  - <15
  - 15 to 20
  - >20
  - % herds

- a
- b
- ab

- a
- b
- n=49
- n=107
- n=43

- 71%
- 56%
- 63%
- 39%
- 30%
- 9%

Herds with high 21-day Pregnancy Rates have high cull rates that are mostly NOT reproductive culls!
Conclusions:

- **Larger** herds and herds with **greater milk** production use TAI more often.

- Herds that use **more TAI** have longer VWP, but need to be careful with extended interbreeding intervals when >80% TAI is used.

- In general, herds that use more TAI are much more likely to have better reproductive efficiency.

- There is no difference in overall culling between herds with low vs. high 21-d PR but the type of cows that are culled differs.
THANK YOU QUESTIONS?