Using Resynchronization Programs
WITH ESTRUS DETECTION & ECONOMIC EVALUATION

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Merck Animal Health

The Fatty Acid Forum sponsored by
Resynchronization Programs with Estrus Detection
Achieving High Fertility Through Multiple Programs

Reproduction programs of award winners at Dairy Cattle Reproduction Council

<table>
<thead>
<tr>
<th>Award Level</th>
<th>100% HD</th>
<th>HD/TAI</th>
<th>100% TAI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platinum (2009–2011)</td>
<td>1</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>Gold</td>
<td>0</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Silver</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Bronze</td>
<td>0</td>
<td>2</td>
<td>0</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>2</strong></td>
<td><strong>21</strong></td>
<td><strong>1</strong></td>
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</tbody>
</table>

Platinum award winners from 2009-2011 ranged in pregnancy rate 29-40%!
Presynch/Ovsynch

PGF  PGF  GnRH  PGF  GnRH  TAI
Presynch/Ovsynch

PGF | PGF | GnRH | PGF | GnRH | TAI
---|---|-----|---|-----|---
14d | 51 | 11d | 72 | 73 |
Resynchronization Programs with Estrus Detection
Presynchronization Protocols

Presynch/Ovsynch

PGF  PGF  GnRH  PGF  GnRH  TAI
14d   51   11d   72   73
Heats: 2–6 d after PGF

Presynchronization Programs with Estrus Detection
Presynchronization Protocols

Presynch/Ovsynch

PGF

PGF

PGF

GnRH

GnRH

GnRH

TAI

14d

51

83%
Heats: 2–6 d after PGF

72

73
Presynch/Ovsynch

PGF
PGF
PGF
GnRH
GnRH
TAI

14d
51

EC Day
4
5
6
7
8
9

72
73
Resynchronization Programs with Estrus Detection
Presynchronization Protocols

Double Ovsynch

<table>
<thead>
<tr>
<th>GnRH</th>
<th>Ovsynch</th>
<th>PGF</th>
<th>GnRH</th>
</tr>
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<tbody>
<tr>
<td>46</td>
<td>53</td>
<td>56</td>
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<table>
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<tr>
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<th>Ovsynch</th>
<th>PGF</th>
<th>GnRH</th>
<th>TAI</th>
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<tr>
<td>63</td>
<td>72</td>
<td>73</td>
<td></td>
<td></td>
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</tbody>
</table>
Resynchronization Programs with Estrus Detection
Presynchronization Protocols

Double Ovsynch

- **GnRH**
  - Sun
- **Ovsynch**
  - Sun
- **PGF**
  - Tue
- **GnRH**
  - Tue
- **GnRH**
  - Tue
- **PGF**
  - Thu
- **GnRH**
  - Fri
Resynchronization Programs with Estrus Detection
Presynchronization Protocols

Double Ovsynch

GnRH  Ovsynch  PGF  GnRH  GnRH  Ovsynch  PGF  GnRH  TAI
46    53      56    63    72    73

EC Day 7
Double Ovsynch

Presynch increases fertility 5–7% units

EC Day 6

G6G

PGF
Mon

Sun

GnRH
Tue

Mon

PGF

Wed

GnRH

Thu

Ovsynch

TAI
What role does estrus detection play in resynchronization of dairy cows?
Resynchronization Programs with Estrus Detection
Timing of Initiation of Resynch

Timing of initiation of resynch according to the phase of the estrus cycle.

Day 0

TAI

Day of Estrus

20 21 22 23 24

GnRH

Day 29

Day 5
Day 6
Day 7
Day 8
Day 9
Resynchronization Programs with Estrus Detection
Pattern of Return to Estrus of Lactating Dairy Cows
## Proportion re-inseminated 20–24d after AI (DC305 data)

<table>
<thead>
<tr>
<th>Cows</th>
<th>Days After AI</th>
<th>Proportion (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>537 lactating cows (80 lb/d)</td>
<td>20</td>
<td>58%</td>
</tr>
<tr>
<td>1,016 lactating cows (90 lb/d)</td>
<td>22</td>
<td>53%</td>
</tr>
<tr>
<td>3,379 lactating cows (82 lb/d)</td>
<td>24</td>
<td>40%</td>
</tr>
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<td>4,971 lactating cows (84 lb/d)</td>
<td>24</td>
<td>55%</td>
</tr>
<tr>
<td>5,778 lactating cows (70 lb/d)</td>
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<td>52%</td>
</tr>
<tr>
<td>8,856 lactating cows (81 lb/d)</td>
<td>24</td>
<td>55%</td>
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</tbody>
</table>

### Cows vs. Days After AI

- Days After AI: 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34
Resynchronization Programs with Estrus Detection
Different Presynch Protocols Before Resynch

Presynch increased fertility 5 – 7 % units but some programs increase the inter AI breeding interval 7 – 13 d

Dewey et al., 2010; Silva et. al., 2007; Giordano et al., 2012
Resynchronization Programs with Estrus Detection
Fertility with GnRH and PGF

No difference on fertility whether GnRH or PGF was used as Presynch

Overall P/AI, 66 d

TAI → PGF → Ovsynch
- 11 d
- 30%

TAI → PGF → Ovsynch
- 7 d
- 27%

TAI → GnRH → Ovsynch
- 7 d
- 26%

NPD d 32

Bruno et al., 2014
Resynchronization Programs with Estrus Detection
GnRH Reduced Number of Cows Detected in Estrus

Bruno et al. (2014)
Resynchronization Programs with Estrus Detection

GnRH Reduced Number of Cows Detected in Estrus

Bruno et al. (2014)
Resynchronization Programs with Estrus Detection
Intervals Between AI With PGF

Interval Between AI
PG 7 d = 36 d
PG 11 d = 39 d
GnRH = 42 d
Resynchronization Programs with Estrus Detection
Pattern of Return to Estrus of Lactating Dairy Cows

Proportion re-inseminated 20–24d after AI (DC305 data)

- 537 lactating cows (80 lb/d) = 58%
- 1,016 lactating cows (90 lb/d) = 53%
- 3,379 lactating cows (82 lb/d) = 40%
- 4,971 lactating cows (84 lb/d) = 55%
- 5,778 lactating cows (70 lb/d) = 52%
- 8,856 lactating cows (81 lb/d) = 55%

Total proportion = 52%
Resynchronization Programs with Estrus Detection
Pattern of Return to Estrus of Lactating Dairy Cows
Resynchronization Programs with Estrus Detection
Pattern of Return to Estrus of Lactating Dairy Cows

Days After AI

Cows

GNRH
Resynchronization Programs with Estrus Detection
Pattern of Return to Estrus of Lactating Dairy Cows

Days After AI

Cows

GNRH
Estimate the impact of reproductive programs on the net return per cow per year ($/cow/year). Two milk prices were evaluated:

<table>
<thead>
<tr>
<th>RP</th>
<th>RP</th>
<th>Compliance to TAI</th>
<th>ED</th>
<th>ED Accuracy</th>
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<tbody>
<tr>
<td>1</td>
<td>ED</td>
<td>—</td>
<td>40</td>
<td>85</td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>4</td>
<td>ED</td>
<td>—</td>
<td>60</td>
<td>95</td>
</tr>
<tr>
<td>5</td>
<td>TAI</td>
<td>85</td>
<td>—</td>
<td>—</td>
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<tr>
<td>6</td>
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<td>7</td>
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<td>—</td>
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Resynchronization Programs with Estrus Detection
Impact of Reproductive Program on Pregnancy Rate and Return per Cow per Year

Milk: $15/cwt

<table>
<thead>
<tr>
<th>Characteristics of the Reproductive Programs</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
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</thead>
<tbody>
<tr>
<td>Compliance TAI</td>
<td>---</td>
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<td>---</td>
<td>85</td>
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<td>ED accuracy</td>
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<td>85</td>
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Resynchronization Programs with Estrus Detection
Reproductive Programs Compared

A. 100% TAI

B. Combined = Estrus Detection + TAI

Giordano et al. (2012)
Resynchronization Programs with Estrus Detection
100% TAI vs. Varying Levels of Estrus Detection/TAI

Net Value ($/cow/y)

Reproductive Program

25% CR
30% CR
35% CR
Resynchronization Programs with Estrus Detection
100% TAI vs. Varying Levels of Estrus Detection/TAI

Net Value ($/cow/yr)

Reproductive Program

-8 to -17 $/cow/yr.
Resynchronization Programs with Estrus Detection
100% TAI vs. Varying Levels of Estrus Detection/TAI

Net Value ($/cow/y)

Reproductive Program:
- 30%
- 40%
- 50%
- 60%
- 70%
- 80%

CR Levels:
- 25% CR
- 30% CR
- 35% CR

Net Value Ranges:
- +1 to +10 $/cow/yr.
Resynchronization Programs with Estrus Detection

100% TAI vs. Varying Levels of Estrus Detection/TAI

Net Value ($/cow/yr.)

Reproductive Program

30% 40% 50% 60% 70% 80%

+9 to +32 $/cow/yr.
1. Presynchronization before Ovsynch improves fertility
   – Whether its first AI or Resynch!
2. GnRH/hCG will reduce estrus and PGF will promote.
   – Don’t use protocols that will reduce estrus if your trying to detect estrus!
   – Estrus Fertility is normally 5 – 10% units better than TAI
3. Initiating Synch with a GnRH/hCG before d 25 will greatly reduce estrus and not improve fertility
4. Shortening your Resynch interval is good but not at the expense of reducing fertility
5. Estrus detection is important but must have accurate detection for good conception rates
6. TAI protocols are an insurance tool