Reproductive Management – Opportunities & Economic Decision Making

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A Few Relevant Questions...
- Value of improving 21d-Pregnancy Rate under current economic conditions?
- Incorporating the use of technology – Activity Monitors
- Reducing the interbreeding interval by early non-pregnancy diagnosis

Wisconsin-Cornell Dairy Repro$

A Few Common Questions...
- Are there differences on the value of improving 21d-PR when baseline value is low versus high?
- Does it pay to go over 24-25% 21d-PR?

On the web at:
http://www.ansci.cornell.edu/dm/index.html
& http://dairymgt.info/tools.php#1
Modeled Scenario

25,000 lbs RHA

Economics of Improving 21d-PR

21d-Preg. Rate

1st AI service
2nd+ AI service

Economics of Improving 21d-PR
**Economics of Improving 21d-PR**

![Graph showing the relationship between 21d-Pregnancy Rate and additional net value (profit).](image)

**Value of Improving the 21d-PR – Take Home**

- Even though some general trends are consistent, the relationship between 21d-PR improvement and $$$ is **COMPLEX**.
- Depends on:
  - Farm type and conditions
  - Repro program used
  - Culling policy – better repro = “profitability driven culling”
  - Labor and economic effort to increase PR

**A Few Relevant Questions...**

- Value of improving **21d-Pregnancy Rate** under current economic conditions?
- Incorporating the use of technology – **Activity Monitors**
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On-farm Scenario

- 40-80% cows
- No change in CR

VWP

50 DIM

Ovsynch

80 DIM

AM System – Parameters

- Life expectancy 3.5 vs. 7 years
- Salvage value 10%

- 500 collars
- $120 per collar
- $10,000 hardware + PC + software
- $1,500 per yr - maintenance
- 2% of collars lost per year

Visual Estrus Detection Parameters

- Items
  - 1,000 cows
  - 1 person,
  - 2 h/day or 3h/day,
  - $12.5/h

- Cost per year for the herd
  - 2h/d ➔ $9,125/yr
  - 3h/d ➔ $13,688/yr

Value of Adopting an Activity Monitoring System

Scenarios evaluated:
- What is the economic value of improving estrus detection (ED) with an AM system when ED is low or high?
- What is the relationship between visual ED cost and AM system economic value?
- What is the impact of AM system lifespan on its economic value? what if the lifespan is 3.5 vs. 7 year?
Estrus detection cost
1 person 2 h per day at $12.5/h

• $ value of replacing visual ED by an electronic AM system is highly dependent on the increase in % of cows AI after a detected estrus and more importantly the lifespan of the system
• Implementing an electronic AM system may not be economically beneficial when ED efficiency is high and visual ED cost is low
• Even though the impact of cost of ED (visual vs. AM) was taken into account, the opportunity cost to personnel when using AM (i.e., go do something else factor!) was not accounted for
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Identification of Non-Pregnant Cows

1. Rectal Palpation
2. Transrectal Ultrasound
3. Blood test

Simulation Experiment 1

Limiting Step

Giordano et al. (2013) JDS 96:949-961
Potential Tradeoffs of Early Non-Pregnancy Tests

- Affected by early pregnancy loss
- Lower sensitivity
- Lower specificity
- More questionable diagnoses
- Additional cost?

Potential Tradeoffs of Early Non-Pregnancy Tests

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Base</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity (%)</td>
<td>98</td>
<td>94</td>
<td>99</td>
</tr>
<tr>
<td>Specificity (%)</td>
<td>98</td>
<td>94</td>
<td>99</td>
</tr>
<tr>
<td>Pregnancy loss (%)</td>
<td>5.25</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Quest. diagnosis (%)</td>
<td>3.3</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>Heat detection rate (%)</td>
<td>50</td>
<td>30</td>
<td>80</td>
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<tr>
<td>Cost test ($/test)</td>
<td>2.4</td>
<td>0.5</td>
<td>5.0</td>
</tr>
</tbody>
</table>

Earlier Test Parameters

- Possible today!
Summary

- Value of early test compared to later test tended to be positive, but negative values were also observed

- More important than the nonpregnancy test per se, is the integration of the test with an aggressive reproductive protocol

Discussion

Economic Value

- Value of a ET could be (+) or (-) depending largely on test parameters and preg. loss
- For baseline parameters the value of ET range from $11 to $13 greater than the value of later tests

Sensitivity

- ↑ Se → ↑ Value
- Most important factor
- 1.8 X more important than Sp
- To be at least 94%

Pregnancy loss

- ↑ Pregnancy loss → ↓ Value
- Same value as Sp

Cost of test

- ↑ Cost CT: ↓ Value
- Least impact of all factors

Giordano et al. (2013) JDS 96:949-961

Resynchronization

Administration of agents that induce ovulation will dramatically REDUCE estrus expression

Giordano et al. (2013) JDS 96:949-961
Thank you!

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