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Reproductive Manipulation
Using Matrix™?

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Matrix is a liquid product marketed by Intervet-Schering-Plough Animal Health

- Progestagen – Synchronize estrus in cycling females
  - Similar to progesterone
  - Active ingredient is Altrenogest
  - The same product used in horses
  - Also known by the trade name Regu-mate™ in some countries

Label Claim

- Use
  - Synchronization of estrus
  - Sexually mature GILTS
  - Which have had at least one estrus

Label Claim, Con’t

- Dosage
  - 6.8 ml/day for 14 consecutive days
  - 15 mg of altrenogest per day
  - Achieve standing heat 4-9 days after treatment removal

- Adverse Reaction
  - Underfeeding may lead to the occurrence of cystic follicles
Reproductive Manipulation Using Matrix

Label Claim, Con’t

- User/Handler Warnings
  - Avoid Skin Contact – Wear non-porous gloves
  - Women should not handle this product if
    - Suspect they may be pregnant
    - Have breast cancer
    - Have undiagnosed reproductive maladies

Mode of Action

- Matrix is a progesterone like compound
- Progesterone – Pro-Gestation
- “Tricks” reproductive system to think that it has active CLs

Withdrawal time

- Gilts must not be slaughtered for human consumption for 21 days after the last treatment
Reproductive Manipulation Using Matrix

Mode of Action

- Feeding Matrix for 14 days gets all gilts to the same point in their ovarian/hormonal status

Reproductive Manipulation Using Matrix

Percentage of Gilts to Express Estrus

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Treatment</th>
<th>Days to Heat - Treated Gilts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trial 1</td>
<td>100</td>
<td>80</td>
<td>4.9</td>
</tr>
<tr>
<td>Trial 2</td>
<td>100</td>
<td>100</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Davis et al., 1979

Reproductive Manipulation Using Matrix

Uses of Matrix

- Synchronize estrus in groups of gilts for introduction to the breeding herd

Reproductive Manipulation Using Matrix

An Example

- Farrow 100/week
- Breeding Target – 125 females/week
  - 95 weaners
  - 18 recycles
  - 12 gilts in heat
Reproductive Manipulation Using Matrix

Example Con’t

- Twelve gilts in heat – need 24 to 36 in the gilt pool (typical recommendation of 36 or more)
- Treat cycling gilts with Matrix in groups of 13-15 per week to get 12 to breed
  - Important that females get full dose each day

What about using Matrix in sows?

**Label Claim**

**Caution:** Federal law prohibits extra-label use of this drug to enhance food and/or fiber production in animals.

Matrix is not approved for usage in sows. Use with caution in sows with advise from your veterinarian.

Matrix Controls

<table>
<thead>
<tr>
<th>Test</th>
<th>Matrix</th>
<th>Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wean to Estrus Interval, d</td>
<td>11.0&lt;sup&gt;b&lt;/sup&gt;</td>
<td>6.9&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>In Heat %, 4-7 days</td>
<td>86.2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>65.6&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Conception %</td>
<td>93.1</td>
<td>88.5</td>
</tr>
<tr>
<td>Number Born Alive</td>
<td>11.2</td>
<td>11.5</td>
</tr>
</tbody>
</table>

Fernandez et al., 2005

No Matrix Matrix 7 Days (2+5) Matrix 14 days (2+12)

| Treatment to Estrus, d | 5.1<sup>a</sup> | 7.3<sup>b</sup> | 6.8<sup>c</sup> |
| Percent Mated, 10 d    | 78.8<sup>a,b</sup> | 72.8<sup>a</sup> | 88.8<sup>b</sup> |
| Viable Fetuses, 50 d   | 12.8<sup>a</sup>  | 12.5<sup>a</sup> | 14.5<sup>b</sup> |

Patterson et al., 2008

What about Nurse offs, Kick outs, Thin Girls and Short litter sows?

Sows weaned early?
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5.2

5.4

5.6

5.8

6

6.2

6.4

6.6

Weaning to Estrus, Days

Lactation Length, Days

Mabry et al., 1996

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Wean in a few days

After weaning

Feeding Matrix to weaned sows

❖ Sow “thinks” she is in the mid-portion of estrous cycle

❖ Removal of Matrix causes the follicle growing hormones to kick in

❖ Short lactation sows have no active CLs
  (No progesterone production)

❖ Short lactation sows have minimal follicle (egg) development
  ❖ Low circulating hormone levels

❖ Short lactation sows have not fully recovered from pregnancy

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Using Matrix

How many days after weaning from a short lactation should Matrix be fed?

- Matrix will hold return to estrus until it is no longer fed.
- The number of days of Matrix feeding, as it relates to the label directions, is not important since the sow is not cycling nor is it "anestrus".

Reproductive Manipulation
Using Matrix

How many days after weaning from a short lactation should Matrix be fed?

- To mimic lactation length in normal lactating sows, the number of days Matrix is fed plus the number of days of lactation should be equal to or greater than 17 days, so to ready the reproductive tract for pregnancy.

\[ \text{Lactation Days} + \text{Matrix Days} \geq 17 \]

- Begin feeding Matrix the day of weaning

Reproductive Manipulation
Using Matrix

Matrix Removal
Two Weeks

Farrowing

Reproductive Manipulation
Using Matrix

Control
Matrix
Matrix

| % in Estrus Day 4-7 | Control 79.6 \( ^a \) | Matrix 83.4 \( ^b \) | Matrix 82.4 \( ^b \) |
| Farrow % | Control 76.1 \( ^a \) | Matrix 82.2 \( ^a \) | Matrix 71.5 \( ^b \) |

Koutsothodoros et al., 1998

Reproductive Manipulation
Using Matrix

Summary

- Matrix will synchronize standing estrus in cycling gilts.
- Each gilt must consume 6.8 ml each day for this product to work effectively

Koutsothodoros et al., 1998

First litter sows, regular lactation, Marintat-Botte, 1995

- Fed using the applicator
- Cost is $1.42 per female per day
- $19.88 for 14 days

- Can be provided in feed
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Summary Con’t

- Matrix is not approved for usage in sows. Use with caution in sows with advise from your veterinarian.
- Matrix has application in sows depending on need and situation. Consult with your veterinarian before usage in sows.

Thank you!