Thank you for participating in SowBridge 2008-09.

To start the presentation, advance one slide by pressing enter or the down or right arrow key.

To see the additional pieces on this CD, click on the links below.

ManagingGilts.pdf
MakingChanges30PSY.pdf
Gettingto30PSY.pdf

Dept. of Animal Sciences, University of Illinois

Use of PG600 to Aid in Control of Reproduction in Swine

Rob Knox
Department of Animal Sciences
University of Illinois

Applications

- Proactive use
  - Prepubertal gilt induction
  - Weaned sow estrus induction
  - Prevention of seasonal anestrus
    - Suggests previous history
  - Induce and synchronize with Matrix
  - Matrix Synchronize and induce
- Reactive or Therapeutic use
  - Induction of infertile or females of unknown status
  - Use in delayed sows

Hormonal induction of estrus in prepubertal gilts

- Reduce entry to service
- Ends the long selection to service in delayed puberty gilts
- Reduces variation in puberty between groups
- Identifies fertile gilts early and improves culling value of non-select gilts
- Reduce size and Cost of gilt pool
- More effective than boar exposure, relocation stress

Cumulative Hi, Medium and low responses for HNS in 170 day old gilts (n>=1,000) housed in pens and receiving BE and followed by mixing and relocation at d 14.

Estrus pattern in gilts

72.5% (n = 720/965) estrus in 80 days (AASV Pre Conf. Symp. Foxcroft, 2002)
What is PG600?

- It is a glycoprotein hormone combination of FSH and LH like hormones:
  - PMSG-pregnant mares’ serum gonadotropin
  - hCG–human chorionic gonadotropin

- Acts to stimulate follicle growth
- induce estrus and ovulation
  - NOT when already Cycling
  - When gilts are nearing puberty
  - At correct age and weight >85 kg and >165 d

Handling and Preparation

- Comes in single or 5 dose bottles
- For single
  - Single dose = 1 ML hormone + 5 ML diluents
  - 5 dose = 5 ML hormone + 25 ML diluents
- Store in cool dry place
- Lyophilized powder and diluents
- Add partial diluents (1 or 5 ML) to powder
  - Do NOT add too much or excess pressure and leakage will occur
- Mix well
- Transfer hormone in diluents to large 5 or 25 ml bottle
- Wash bottle once more and transfer remaining liquid

How PG600 Works

Day 0. PG600 injected into muscle

PG600 diffuses into blood

Binds to follicles with FSH and LH receptors

In 5 days

Stimulates large follicle growth, and Estrogen production

Inject

- Use a 5-10 cc syringe
- Use a 16-18 g needle 1-1/5 inches long
- Avoid leakage
  - Restraint
  - speed
- Give in neck behind the ear

Safety

- Not harmful
- A glycoprotein hormone not absorbed through skin
- Similar hormones in humans and pigs
- Low chance for problems if accidently injected but allergic reaction possible
- Perhaps greater concerns for pregnant women

Improve responses

- Choose healthy fast growing animals
- Stimulate with movement, regrouping, boar exposure
- Try sc injection
When to use PG600
The Gilt reproductive cycle

Typical PG600 response in prepubertal gilts

- Most grow large follicles
- 60-70% express estrus
- 70-80% ovulate
- Injection to estrus interval is 4-6 days
- Estrus lasts 1-2 days (1.5 day average)
- Ovulation occurs at 30-40 hours after onset of estrus
- Ovulation rate averages 13

Field Experience
Opportunity Gilts (n= 799) Receiving PG600 170 d BE and if no estrus PG600 23 days later

In prepubertal gilts, ovarian status at time of injection may impact response
-Follicle development to Puberty-

Response of gilts by age to PG600

Step 1
How to decide if to use PG600
Establish Herd Puberty and Time to Induce

- Take pools of gilts within tight windows of age (160-170 days) and then expose to a boar 15 min. daily until 210 days
- Determine non-responders by 210 days
- Plot or graph estrus response pattern
PG600 Use
• You can choose to induce and breed based on non-estrus gilts by day or age
• Choose to breed needed gilts at induced if they meet age and weight requirements (>180 days and 136 kg.)
• Gilts can be salvaged at 220 days if they come into estrus within 5 days or shipped if they fail

PG600 Breeding
• Breed at induced when >135 kg.
• Fewer induced gilts express estrus at next cycle
• Skip breeding increases litter size but not breeding number
• No adverse lifetime effect

Should you breed on a PG600 Induced 1st estrus?
Effect of mating at 1st spontaneous estrus, PG600 Induced Estrus, or spontaneous estrus after PG600 Induced estrus

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Age Bred (d)</th>
<th>FR</th>
<th>LS</th>
<th>% having 4 litters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>197</td>
<td>89</td>
<td>9.9</td>
<td>77 %</td>
</tr>
<tr>
<td>PG600</td>
<td>185</td>
<td>70</td>
<td>9.6</td>
<td>74 %</td>
</tr>
<tr>
<td>Skip</td>
<td>215</td>
<td>90</td>
<td>10.7</td>
<td>65 %</td>
</tr>
</tbody>
</table>

** NS
Kirkwood et al., SHAP, 8:2000

Effect of PG600 and Fixed time AI

<table>
<thead>
<tr>
<th>Treatment</th>
<th>BW</th>
<th>Return %</th>
<th>Age</th>
<th>Farrow</th>
<th>NBA</th>
<th>wean wgt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>109</td>
<td>17</td>
<td>320</td>
<td>7.3</td>
<td>137</td>
<td></td>
</tr>
<tr>
<td>PG600</td>
<td>96</td>
<td>35</td>
<td>304</td>
<td>7.0</td>
<td>134</td>
<td></td>
</tr>
<tr>
<td>Skip</td>
<td>106</td>
<td>12</td>
<td>324</td>
<td>8.4</td>
<td>135</td>
<td></td>
</tr>
</tbody>
</table>

* NS
AI at 4 and 5 days
Percent to parity 5 no effect
Holtz et al., 99 Anim. Reprod. Sci. 57:177-183

Prepubertal Gilt Breed or Delay
• Breed
  – Estrus known
  – Reduced days
  – Low litter size
  – Lower pregnancy rate
  – Longevity concerns
• 2nd cycle
  – No guarantee of 2nd cycle
  – Higher fertility at 2nd cycle
  – Higher fertility
  – Longevity high

PG600 in weaned sows
Sows often fail to return to estrus after weaning

- Sows make up 80% of a breeding group
- Replacement gilts are needed to compensate for
  - No estrus
  - Delayed returns
  - Season
  - Parity
  - Lactation length

PG600 can advance estrus and reduce wean to estrus interval

<table>
<thead>
<tr>
<th>Days from weaning</th>
<th>% of sows</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>25</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
</tr>
<tr>
<td>5</td>
<td>35</td>
</tr>
<tr>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>7</td>
<td>45</td>
</tr>
</tbody>
</table>

Control n = 521
PG600 n = 147

PG600 Use in Sows Return on Investment

<table>
<thead>
<tr>
<th>Method</th>
<th>nWeaned</th>
<th>Bred (%) x</th>
<th>Farrow (%) x</th>
<th>Born Alive</th>
<th>T Pigs</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>2000</td>
<td>x 0.83</td>
<td>x 0.80</td>
<td>10.5</td>
<td>13,944</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1660)</td>
<td>(1328)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PG600</td>
<td>2000</td>
<td>x 0.93</td>
<td>x 0.80</td>
<td>10.0</td>
<td>14,880</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(1860)</td>
<td>(1488)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

936 pigs x $30/pig = $28,080
2000 doses @ $4.00/dose = $8,000
1:3.5 return

Effect of Wean to Estrus Interval on Farrowing Rate and Litter Size

<table>
<thead>
<tr>
<th>Interval (days)</th>
<th>FR (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>95</td>
</tr>
<tr>
<td>2</td>
<td>90</td>
</tr>
<tr>
<td>3</td>
<td>85</td>
</tr>
<tr>
<td>4</td>
<td>80</td>
</tr>
<tr>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>6</td>
<td>70</td>
</tr>
<tr>
<td>7</td>
<td>65</td>
</tr>
</tbody>
</table>

Steverink et al., JAS 1999 77:801

Gonadotropins Improve Fertility

<table>
<thead>
<tr>
<th>Control</th>
<th>PG600</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>148</td>
</tr>
<tr>
<td>Estrus% (7d)</td>
<td>79.0</td>
</tr>
<tr>
<td>WEI</td>
<td>4.8</td>
</tr>
<tr>
<td>Farrow (%)</td>
<td>88.0</td>
</tr>
<tr>
<td>N farrowing</td>
<td>107.0</td>
</tr>
<tr>
<td>Born alive</td>
<td>10.7</td>
</tr>
</tbody>
</table>

% Improvement in pigs +19%

http://www.livestocktrail.uiuc.edu/swinerepronet