Reducing Preweaning Mortality & Morbidity

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Agenda
- Stage setting
  - National litter data
  - Basic pig biology
- Colostrum and milk management tips
- Appendix

National farrowing data

<table>
<thead>
<tr>
<th>Item</th>
<th>#/litter</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total born</td>
<td>11.5</td>
<td></td>
</tr>
<tr>
<td>Stillbirths/mummies</td>
<td>1.0</td>
<td>8.4</td>
</tr>
<tr>
<td>Total born alive</td>
<td>10.5</td>
<td></td>
</tr>
<tr>
<td>Preweaning mortality</td>
<td>1.1</td>
<td>10.9</td>
</tr>
<tr>
<td>Weaned</td>
<td>9.4</td>
<td></td>
</tr>
</tbody>
</table>

NAHMS, 2006

Causes of preweaning deaths

<table>
<thead>
<tr>
<th></th>
<th>% of prewean deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scours</td>
<td>60</td>
</tr>
<tr>
<td>Crushed</td>
<td>50</td>
</tr>
<tr>
<td>Starved</td>
<td>10</td>
</tr>
<tr>
<td>Other</td>
<td>10</td>
</tr>
</tbody>
</table>

Producer ID'd cause

NAHMS, 2006

Occurrence of mortalities

<table>
<thead>
<tr>
<th>Days postweaning</th>
<th>% of mortalities</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 3 d</td>
<td>50</td>
</tr>
<tr>
<td>4 - 7 d</td>
<td>50</td>
</tr>
<tr>
<td>8 - 14 d</td>
<td>10</td>
</tr>
<tr>
<td>&gt; 15 d</td>
<td>10</td>
</tr>
</tbody>
</table>

Care has big impact here

Risk factors for mortality

<table>
<thead>
<tr>
<th>Birth wt, lb</th>
<th>No. pigs</th>
<th>Mortality, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 2.2</td>
<td>29</td>
<td>45</td>
</tr>
<tr>
<td>&gt; 2.2</td>
<td>173</td>
<td>5</td>
</tr>
</tbody>
</table>

IPVS, 2004
Risk factors for mortality

<table>
<thead>
<tr>
<th>Birth wt, lb</th>
<th>&lt; 2.2</th>
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<td>173</td>
</tr>
<tr>
<td>Mortality, %</td>
<td>45</td>
<td>5</td>
</tr>
<tr>
<td>Birth order</td>
<td>1 to 7</td>
<td>&gt; 7</td>
</tr>
<tr>
<td>Mortality, %</td>
<td>8</td>
<td>75</td>
</tr>
</tbody>
</table>

IPVS, 2004

Characteristics of newborns

- No antibody protection
- 1 – 2 % body fat
- Limited ability to make glucose
- Stored glucose gone in 24 hr
- Poor body temperature regulation
- Wet

Normal lactation behavior

- Udder massage by pigs
- Increased grunting by sow
- Oxytocin released
- Milk letdown ~30 seconds
- Pigs gradually cease nursing

Sow behavior in farrowing

- Lying, not nursing: 36%
- Nursing: 6%
- Eating: 6%
- Other (Stand, drink, sit): 22%

3% of lying-down time on her belly

McG lone, 2003

Teat fidelity (ownership)

- Very strong attachment to a teat until weaning
- Developed 1st few days of life
- Advantage to piglet
  - Reduces competition & fighting

Normal vs disadvantaged piglets

<table>
<thead>
<tr>
<th>Item</th>
<th>Normal</th>
<th>Disadvantaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Born**</td>
<td>quickly</td>
<td>slowly</td>
</tr>
<tr>
<td>Birth order</td>
<td>early</td>
<td>late</td>
</tr>
<tr>
<td>On feet</td>
<td>1-2 min</td>
<td>&gt; 2 minutes</td>
</tr>
<tr>
<td>Chilled**</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>Sucking</td>
<td>&lt; 15 min</td>
<td>&gt; 15 min</td>
</tr>
<tr>
<td>Birth weight</td>
<td>&gt; 2.75 lb</td>
<td>&lt; 2.75 lb</td>
</tr>
</tbody>
</table>

** things you can affect
Pathway to death for pigs

- Chilly surroundings
- Body temperature drops
- Lazy
- Starve
- Overlay
- Reduced colostrum intake
- Disease
- Death

Prevent chilling of newborns

Observe pig lying behavior to access thermal needs.

Chilled

Comfortable

Zone heating

- Solid overlay
- 2-3 heat lamps
- 60-65°F
- 90-95°F

Colostrum

- Very rich source of antibodies
- Antibodies can enter piglets’ bloodstream only first 24 hours of life
- Critical for future health & performance

Important colostrum points

- Very first milk richest and best
- Quality of colostrum declines
- First-born pigs get best colostrum
- Chilled pigs consume less
- Maximum absorption first 6 to 12 hr of life
- By 24 hr no further absorption

Ensure good colostrum intake

- Gap-fill
  - E.g., newly-farrowed sow has 18 pigs; another sow just starting to farrow has two pigs; put some pigs (late born best) on farrowing sow for ~1 hour
  - E.g., sow with 9 pigs & 13 functional teats nearing end of farrowing; another newly-farrowed sow has 13 functional teats, but 16 pigs; transfer 3 piglets
- It’s possible that sow with nine not done yet
- Record pig movements (+ and – on the card)
Good colostrum intake (con’t)
- Split suckle
  - Remove largest pigs from litter for 2-1 hr periods first 12 hr after farrowing
  - Give sow ~½ mL oxytocin
- Prevent chilling
  - Chilled pigs consume less

What is a fall-out?
- Other names
  - Fall-backs, runts
- Smaller, less active piglet
- 2 to 7 days of age

What is a fall-out?
- Bony and angular
- Flat belly
- Loose skin
- Hairy

Fall-outs
- Nursing a poor-producing teat
- Shy, non-aggressive pig missing feedings
- Many flourish with better milk access

Reducing deaths & fall-outs
- Ensure good colostrum intake
  - Gap-fill
  - Split suckle
  - Prevent chilling
  - Administer colostrum via stomach tube
- Conduct good day 1 fostering technique

Nine piglets identified as fall-outs 5 days ago
Good day 1 fostering

- Move very few piglets
- Gather all small piglets (dinks) and place on nurse sows that farrowed same day
  - Fill according to functional teat count that’s written on card
- Don’t disturb litter if all piglets doing well

Nurse sows

- Same-day farrowed
  - All piglets were given to other sows
- Early-weaned sows
  - Nursing large, well-performing litter
  - Good body condition

Nurse sow - option #1

- Newly-farrowed gilt
  - Small teats
  - Won’t easily notice stranger piglets
  - Give her piglets to other newly-farrowed females

Nurse sow - option #1

- Collect 8 to 10 fall-backs
- Give to the freed-up gilt
- Moves piglets backward
  - Starving, not sick
- Need space for gilt’s piglets

Nurse sow - option #2

- “Bump” weaning
  - Move fall-backs to later lactation, good-milking sows
- More stressful than option #1
- Maximum weaning age not exceeded

Nurse sow - option #3 - Denmark

- Move excess newborns to later lactation, good-milking sows
- Red
  - One step
  - Excess newborns
- Yellow
  - Two-step
- Sows A & B
  - P1 or P2 preferred
- Piglets weaned

Sows A & B
- Days
  - 6
  - 4-7
- Piglets weaned
  - A
  - 21
Effect of one vs. two step nursing

<table>
<thead>
<tr>
<th>Nurse sow</th>
<th>One-step</th>
<th>Two-step</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. piglets added to sow</td>
<td>11</td>
<td>11</td>
</tr>
<tr>
<td>No. piglets weaned*</td>
<td>9</td>
<td>10.4</td>
</tr>
<tr>
<td>Piglet weaning wt, lb*</td>
<td>12.1</td>
<td>14.1</td>
</tr>
</tbody>
</table>

*Significant effect National Committee, 2005

Nurse sow tips

- Move sow rather than litter
  - Requires leaving some farrowing crates vacant at loading
    - ~ every 12th crate open in the room
  - Keeps age of pigs in area more similar
- Danish method
  - Move excess newborns 6 (large pigs) or 12 h (small piglets) after birth
  - Ensures better colostrum intake

A fall-out to leave at home

- Keep the established social order intact as much as possible
- Signs
  - Selected a teat
  - Nursing regularly
  - Maintaining position
  - 8 littermates

A fall-out to move

- Doesn’t join littermates to nurse
- Not selected a teat
- Shy, timid
- 10 littermates

Key points

- Avoid moving individual fall-backs
  - Move 8 to 10 fall-backs at once to a nurse sow
- Identify and move fall-backs by 5-7 day of age
- Otherwise leave them put

Rules for 5% prewean mortality

- Carefully observe each piglet daily for evidence of adequate milk intake
- Identify disadvantaged piglets quickly
- Prevent chilling of piglets
- Avoid heat stress on sows
- Clean crates and processing equipment
Rules for 5% prewean mortality

- Avoid mixing pigs as much as possible
  - It is okay for each litter to have a good-doing runt(s)
- Continually read, interpret pig behavior, and act accordingly
- Crossfoster properly
- Maximize colostrum intake

Trauma (overlay, crushed)

- Risk higher the more sow stands/sits/lie
  - Reasons why sows maybe restless
    - Inadequate water supply
    - Sore teats
    - Too many piglets for # active teats
    - Fear of humans
    - Limit feeding
    - Too hot
    - Farrowing difficulty

Milk composition

- Water
- Protein
- Other

Milk production

- Up to 2 gallons/day
  - 80% water
- Nipple waterer should deliver 1 cup in 15 seconds

Drying agents?
Ensure good colostrum intake

- **Split suckle**
  - Remove large (& early-born regardless of size?) pigs from litter for 2, 1-hr periods first 12 hr after farrowing
  - Give sow ~ ½ mL oxytocin
  - Use especially on litters > 9 pigs and many disadvantaged piglets

Do not “even up” litters

- Moving 5 to 7 day-old fall-backs to litters with fewer piglets
- More harm than good
  - Fall-out is an intruder

Limited vs. continuous fostering

<table>
<thead>
<tr>
<th>Item</th>
<th>Limited*</th>
<th>Continuous</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within-litter SD of body wt., lb</td>
<td>2.0</td>
<td>0.7</td>
</tr>
<tr>
<td>Mortality, %</td>
<td>8.0</td>
<td>8.8</td>
</tr>
<tr>
<td>Pig weaning wt., lb</td>
<td>11.6</td>
<td>9.4</td>
</tr>
</tbody>
</table>

*First 2 days of life only; Straw et.al., 1998.

Pig sociology summary

- Avoid mixing pigs as much as possible
- Accept that life is harder for pigs in pens when we make it so every pig is the same size
- Resist moving pigs that are smaller than penmates, just because they are small
  - Leave full-bellied, smooth, slick hair-coated smaller pigs alone

Milk replacers – option #3

- Decks above crates
Milk replacer use ideas

- Training important
  - Dip snout into milk, few seconds/hour
- Best use strategy?
  - Identify best milking sow in room
  - Place her entire litter on milk replacer
  - Give her 8-10 fall-outs from the room