Preventing lameness in group housed sows

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Outline

1. History of group housing in NL

2. Floor properties and lameness

3. Group management and lameness

4. Successful group housing
1. History of Dutch sow group housing

- 1985-1990: Introduction of new ESF systems
- 1991: “Too early” based on system comparison
- 1990-1997: Decline in number of group housed sows
- 1997: New study: Group housing possible (4d post service)
- 1998: Group housing in new Welfare Regulations
- 2003: NL 2008 deadline postponed to EU 2013
Lameness over parities: recovery in lactation
Problems in the nineties

- Aggression
- Vulva biting
- Inspection (management more complex)
- Lameness
  - 1991 – 25% of culling caused by lameness
  - 1996 – 20% of culling caused by lameness
Lameness In Group Housing in NL

- 1990-1995 Large project on lesions and lameness
- 2005 Extra attention by “Claw Check” (pig farmers)
- 2011 Welfare Quality 81 NL-Farms, each 30 Sows
2. Floor properties and lameness

2.1 Abrasiveness

2.2 Friction

2.3 Softness

2.4 Slots and slats

*(based on Waldmann, 2004)*
2.1 Floor properties - abrasiveness

<table>
<thead>
<tr>
<th>Floor property risk</th>
<th>Abrasiveness</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Too high roughness</td>
</tr>
</tbody>
</table>

- Concrete for abrasion is fine
- Long toes on metal and plastic slatted floors
- Systems with bedding or plastic/metal floors: partly concrete necessary
- Don’t forget abrasive floor in gilt rearing systems
2.2 Floor properties - friction

<table>
<thead>
<tr>
<th>Animal type</th>
<th>Coefficient of sliding friction (Ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gilts and sows</td>
<td>0.40 to 0.25</td>
</tr>
<tr>
<td>Fattening pigs</td>
<td>0.35 to 0.20</td>
</tr>
<tr>
<td>Weaning pigs</td>
<td>0.30 to 0.20</td>
</tr>
</tbody>
</table>

Relationships between normal, traction and friction forces and coefficient of friction (COF)

\[ F_\mu = \text{COF} \times F_N \]

(Baxter, 2009; von Wachtenfelt, 2009)
Measuring Resistance

Leroux measurement

FSC 2000
Forces on front and hind legs on clean and dirty concrete

Vertical and resultant horizontal GRF’s for fore and hind limbs from the mean of 10 pigs walking in a curve on clean and fouled concrete.

(von Wachtenfelt, 2009)
Less friction on manure covered surface

(Baxter, 1984)
### 2.3 Floor properties - softness

<table>
<thead>
<tr>
<th>Floor property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Softness</td>
<td>Too soft floor (e.g. straw, rubber)</td>
</tr>
<tr>
<td></td>
<td>Sharp splits, slats, floor defects</td>
</tr>
</tbody>
</table>

Softness limits of floors as suggested by Swedish test in cows

(Waldmann, 2004)
Rubber mats

(Knoop et al., 2009)
2.4 Floor properties – slot/slat widths and ratio

<table>
<thead>
<tr>
<th>Floor property</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slots and slats</td>
<td>Too wide slots, gaps</td>
</tr>
<tr>
<td></td>
<td>Too small slats</td>
</tr>
</tbody>
</table>

(Baxter, 1984)

(Geyer, 1988)
## Slatted or solid floor

<table>
<thead>
<tr>
<th>Reference</th>
<th>Fully slatted floor</th>
<th>&lt;40% solid floor</th>
<th>&gt;40% solid floor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claw problems</td>
<td>Greif, 1985</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>Claw injuries</td>
<td>Jensen, 1997</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Claw defects</td>
<td>Candotti, 2004</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Lameness</td>
<td>Nielsen, 2004</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>Bursitis</td>
<td>Lyons, 1995; Smith, 1992</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

(Vermeij et al., 2009)
3. Group Management – minimise mixing (risk)

**Arena:**
- Temporary mixing pen
- Dry, soft floor with space
- Ad lib feed
- Hiding barriers

Not reducing aggression but minimizing negative effects
Relation between number of new sows in group and skin lesions, related to group composition before and after lactation
4. Attention for “details”:

- Be critical on legs when buying/selecting gilts
- Eliminate sharp edges where equipment is fixed to floor
- Minimise barriers or steps between functional areas
- Prevent wet surfaces on level solid floors
- Make wide pen shape (width of passages, sow turns)
- Take returners to estrus out (mounting)
- Train social skills for gilts
- Expect difficult period after conversion
Successful group housing

**Major Success factors:**

- No obstacles, smooth floor with “grip”
- Dry and clean floor
- Space to prevent sharp turns
- Use gilts with social skills
- Limit aggression by minimizing mixing moments
Thanks for your attention

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