Moving from good to great in sow herd productivity

The productivity of a sow herd is expressed in pigs weaned per sow per year (PSY) and is based on the relationship between three factors:

- Farrowing rate
- Pigs born alive (or litter size)
- Pre-weaning mortality

To maximize sow herd productivity, all three factors must be managed effectively. Data from almost 900,000 sows in real-world commercial operations have demonstrated that PIC females constitute a solid genetic foundation for taking your sow herd productivity from good to great.

Great performance starts with great genetics …

<table>
<thead>
<tr>
<th>PigCHAMP Performance Data</th>
<th>PIC Camborough® Sow Herds</th>
<th>PIC Production Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sows</strong></td>
<td>n/a</td>
<td>898,118</td>
</tr>
<tr>
<td><strong>Farrowing rate, %</strong></td>
<td>76.7</td>
<td>86.0</td>
</tr>
<tr>
<td><strong>Total born per litter</strong></td>
<td>11.5</td>
<td>11.9</td>
</tr>
<tr>
<td><strong>Born alive per litter</strong></td>
<td>10.3</td>
<td>11.0</td>
</tr>
<tr>
<td><strong>Pre-weaning mortality, %</strong></td>
<td>12.5</td>
<td>9.3</td>
</tr>
<tr>
<td><strong>Litters/sow/year</strong></td>
<td>2.33</td>
<td>2.46</td>
</tr>
<tr>
<td><strong>Pigs weaned/sow/year</strong></td>
<td>20.7</td>
<td>24.2</td>
</tr>
</tbody>
</table>

This table shows the performance of different operations with PIC parent females Camborough® 22, Camborough® 23 and Camborough® in North and South America during 2003 and 2004. Productivity of PIC maternal lines averaged 24.2 pigs per sow per year based on almost 900,000 females recorded in this PigCHAMP database. During the same time period, the entire North American PigCHAMP database showed an average of 21.8 pigs per sow per year—that’s 11% less productivity. (At the same time, USDA (2005) reported the average productivity across the entire U.S. pork industry to average 17.0–17.5 for 2003 and 2004.) Just think what an additional 11% productivity could mean to your operation’s bottom line. The production targets set by PIC are attainable performance levels based on genetic improvement rates and system performance seen within PIC customer farms.

… And ends with great management

The PIC parent female production targets above illustrate an opportunity for all PIC producers to increase sow herd productivity and efficiency through proper sow management. Although the PIC herds are 11% more productive than the PigCHAMP average, the individual production targets are cumulatively 8% below PIC targets. By following the basic principles of sow management, you can make the final transition from good to great and maximize the full genetic potential of PIC females. These sow management principles include:

- Biosecurity to prevent disease introduction
- Regular flow of acclimated gilts to achieve weekly breeding targets
- Implementation of management protocols and following them
- Personnel selection, training and motivation
Three cornerstones to improve your production targets

Too many operations underperform because something is missing or overdone, resulting in a lack of production efficiency (MacDougald, 1998).

Take a closer look at the three cornerstones of sow herd productivity and steps to move the needle on your production targets.

Cornerstone 1
Farrowing rate

Farrowing rate variation is a matter of multiple factors, including:
- Quality of the semen dose
- Quality of the inseminated female
- Ability to detect estrus onset
- Capability of making good, multiple matings
- Disease challenges
- Movement during gestation

Some operations cope with disease challenges within systems through depop/repop, herd closure and animal flow changes. Although these protocols may improve health status, maintaining breeding targets and parity distribution may result in compromises in culling procedures.

Systems with high farrowing rate targets have acclimated gilts for breeding targets and parity distribution may result in compromises in culling procedures.

Pre-weaning mortality is also influenced by farrowing induction. Unpublished data from PIC reveals that new genotypes tend to have longer gestations (85% of the farrowings are in or after 115 days of gestation and 60% are in or after day 116). On the other hand, it is not uncommon to see operations inducing at 113 or 114 days of gestation and 60% are in or after day 116. On the other hand, it is not uncommon to see operations inducing at 113 or 114 days of gestation. This can result in a certain percentage of the litters born one to three days before the “natural” farrowing date, causing lower body weight and less mature lungs. Establish a specific induction protocol based on the average gestation length for the operation rather than a universal protocol.

Operations with good health status and strong management have the lowest pre-weaning mortality. Successful control of factors such as daily feed intake in lactation, farrowing room temperature control, water availability and piglet processing will deliver benefits.

For more information, contact your PIC Account Manager or PIC Technical Services.

Cornerstone 2
Pigs born alive (Litter size)

Litter size is a function of ovulation rate, embryonic and fetal survival, and uterine capacity. Research suggests that the ovulation rate is extremely high and apparently not a limiting factor in litter size. However, uterine capacity is a major factor in determining litter size. During the first part of gestation, uterine capacity begins to constrain the conceptus (embryo) number regardless of ovulation rate (Vonnahme et al., 2000).

Female movement during the process of embryonic implantation is one of the most detrimental factors to good litter size. Operations with the best litter sizes limit female movement to less than three days postinsemination or after the four-week pregnancy check period.

Cornerstone 3
Pre-weaning mortality

Piglet mortality in the North American industry has consistently been around 10% (NAHMS, 2001). Cause of death usually is an interaction of several possible factors.

As small piglets are more susceptible to the cold, they have a greater chance of being crushed by the sow because they lie close to their dam (Lay, 2002). To minimize this problem, employees must “read” the piglet behavior and take prompt actions to correct a too cold (or too hot) microenvironment in the crate. Management procedures, such as drying the piglets at birth or using a heat box (under the heat lamp) should help to control this chilling and starvation complex. A heat box also improves the odds that all piglets in the litter have the same chance for colostrum intake during the first eight hours after birth.

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Literature cited