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Welcome to Benchmark

Farms.com Ltd and PigCHAMP are pleased to bring you the 2010 edition of Benchmark – Setting Higher Standards in Pork Production.

In many ways, annual benchmarks are like new technology – their value lies less in the possession and more in the implementation. And that leads into benchmarking – the active use of benchmarks to improve productivity as a result of the findings.

The first step in creating benchmarks is the establishment of a database that includes the records of the farms that share in the benchmarking project. To allow comparisons, farms with stable herds that have reported production throughout the calendar year are included. If you are not already participating in the PigCHAMP Benchmarking program, we strongly encourage you to do so. Producers in this program receive quarterly updates of how their operations compare to benchmark averages, all at no additional charge. PigCHAMP also offers in-depth, customized reports for a small fee.

While there are many important production traits, increased emphasis is being placed on maximizing the value of females, hence our focus on Improving Reproductive Efficiency. Topics were selected and developed by recognized leaders in this field and the authors have provided thought-provoking, challenging content. Complementary articles will help you gain a better understanding of market analysis, human resource development, and new advances in recordkeeping software and disease management.

A special thank you goes to Dr. Ken Stalder and Dr. John Mabry at Iowa State University for their help in coordinating the articles, and to Dr. Anil Sukumaran Nair for compiling the benchmark data. Thanks also to Susan Olson, Knowledge Center Manager at PigCHAMP; and to JoAnn Alumbaugh, Benchmark editor. Finally, a sincere thank you to our advertisers – your support is appreciated.

It is more important than ever to look for ways to gain advantages in efficiency and productivity. The more you know about your operation, the better equipped you are to make improvements in key areas. This is the objective of Benchmark. We hope you find this year’s publication helpful in your operation, and we look forward to meeting your needs in the future.

Graham Dyer
President and CEO
Farms.com Ltd.
www.farms.com

Bob Brcka
General Manager
PigCHAMP, Inc.
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WHAT’S IN A NUMBER?

Numbers and measures in the absence of context can lead to incorrect conclusions.

By Stephanie Rutten-Ramos

Numbers give us confidence. The ability to take a measurement provides a sense of security – a sense that we know how things really are – a sense that we know the ‘truth.’ To paraphrase W.E. Demming, if we measure something, we should expect improvement. It seems that the energy spent in the process of measurement can translate into improvement of the process as a whole. That being said, be careful what you measure!

In addition to using numbers to measure a process, we also use numbers to compare products, methods and materials. Whenever we try to do such a comparison, we can expect to reach one of the following conclusions: the true conclusion (there is a real difference, or there is not a real difference), or the false conclusion (there is a difference when there really isn’t, or there is no difference when there really is).

Our ability to use numbers to count, average and otherwise describe situations, however, can give us a false sense of security about our ability to reach correct conclusions. Our inclination to use selective measuring to justify ‘gut-level hunches’ is likely to do more damage than good.

CONSIDER THE FOLLOWING CASE.

A newly-expanded sow herd with a “green” herd manager was struggling to produce quality weaned pigs. The genetic supplier provided the owners with a list of areas to improve upon. The consulting veterinarian decided the first priority would be to reduce the current rate of stillborns by half a pig.

Up to this point, the herd had been inducing sows to farrow on day 116 of gestation, and loading them on the same day. After reviewing the induction protocol, the consulting veterinarian decided to ‘run a trial’ to see if inducing the sows at day 115 would reduce the stillborn rate. Therefore, he instructed the farm manager to use the new induction protocol for two months, after which they would look at stillborn rates to see if the new protocol generated enough improvement. The manager was also instructed to load sows earlier (by day 113) to avoid having sows farrow in gestation.

In all reality, this ‘trial’ is nothing more than a ‘try-it-and-see’ approach. Its outcome will be selectively used to justify a hunch to a skeptical audience. However, a bit of design discipline up front is all this herd would have needed to conduct a valid trial that would yield a reliable outcome. Not only would a valid design be more apt to obtain the true result (i.e., there is an effect when there really is or there is no effect when there really is not), it would also improve the farm’s confidence in the outcome and may even decrease the time needed to reach a conclusion.

SO WHAT QUESTIONS SHOULD BE ASKED?

• What is the normal variability in stillborn rate?
• Are there substantial differences in stillborn rates across parities, such that a possible “parity effect” needs to be incorporated into the trial design?
• What is the appropriate outcome variable: stillborn rate or percent of total born weaned (i.e., if decreasing stillborns results in more low viability piglets, is there any gain)?
• From an economic perspective, what difference in stillborn rate would warrant a change in protocol?

Answers to these questions would allow the veterinarian and herd manager to make a reasonable decision about the number of sows over which the two protocols (induction on day 115 versus induction on day 116) will need to be compared.

Here the veterinarian intended to use historical records as the “control,” or basis for protocol comparison. This is an area where many on-farm trials go awry; fair trials are not as simple as comparing data from two different time periods. Many variables have a seasonal component. And too often, multiple changes are instituted, while only a single change is considered in the analysis. When more than one change is made, it is unreasonable to conclude that any observed difference could be attributed to a single item.

In this case, two management changes were being made – loading day and induction day – while only one change was to be considered as having an effect on stillborn occurrence. In order to draw a reasonable conclusion about the effectiveness of the induction protocol, this induction protocol needs to be compared across sows loaded by the same day of gestation.

CONSIDER MULTIPLE FACTORS

The number of sows over which the trial should be performed depends on a number of factors pertaining to how certain the herd wants to be about the reliability of the outcome, how big a difference in stillborn rate they want to be able to detect, and how much variation is normally observed in outcome measure.

Although the number of stillborn pigs per litter is not a normally distributed variable, the veterinarian or producer could use a student’s T-test to compare the means between the treatment and control groups. Table 1 lists the number of sows to be included in each trial group given the standard deviation of stillborn pigs per litter and desired difference observed between treatments, when the probability of detecting a difference when there is none is 5% (alpha=0.05) and the probability of missing a real difference is 20% (power=0.8).
Another common abuse of numbers occurs with the simplistic retrospective ‘analysis’ (for example, what change caused production to decrease). Just as the previous scenario was prone to reach an errant conclusion, so too is this one. Correlation does not equal causation, and populations change over time. For these reasons, the conclusions of simple retrospective studies (looking into the past) are not as reliable as those from prospective studies (following into the future). Well-designed retrospective analyses, however, can account for many factors, including changes to populations. Yet, the detailed analysis is rarely employed in the pig barn.

HERE’S AN EXAMPLE.
An experienced herd manager grew frustrated watching litter size diminish over time. In an effort to determine the cause, he looked back through his calendar records along with a performance monitor and concluded that the drop off in litter size was attributable to the use of a newly formulated vaccine. (See Figure 1) In reality, at the same time the vaccine manufacturer was reformulating the vaccine, this herd was initiating a gradual rollover into a new genetic program. The cause of the declining litter size was related to the changes in herd population composition and age structure (Figures 2a and 2b).

This practice is far too common in pig production. Both positive and negative change in production caused by changes in population compositions are attributed to people, practices or products (materials). In the absence of a detailed analysis (i.e., consideration of all potentially influential factors), errant cause-and-effect conclusions are reached and the root causes of problems are not identified and addressed.

DUE DILIGENCE
The value of numbers and their use to make decisions is unquestionable, but numbers have to be used appropriately. Part-prospective, part-retrospective ‘trials’ lend themselves to errant conclusions, and simple retrospective analyses can be just plain dangerous. All too often, they are employed to justify gut-level approaches to skeptical audiences. And how many times are new protocols instituted under the guise of a trial and never removed? With the lack of disciplined design, these analyses stand to miss real effects that actually exist.

A little due diligence is all that is needed for herds and operations to be able to make management decisions on the basis of statistical evidence. After all, we’re devoting resources to data capture, so why not make the most of it?

<table>
<thead>
<tr>
<th>Change in piglets per litter</th>
<th>1.0</th>
<th>1.1</th>
<th>1.2</th>
<th>1.3</th>
<th>1.4</th>
<th>1.5</th>
<th>1.6</th>
<th>1.7</th>
<th>1.8</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>51</td>
<td>61</td>
<td>72</td>
<td>85</td>
<td>98</td>
<td>113</td>
<td>128</td>
<td>144</td>
<td>162</td>
</tr>
<tr>
<td>0.25</td>
<td>199</td>
<td>241</td>
<td>286</td>
<td>336</td>
<td>389</td>
<td>446</td>
<td>508</td>
<td>573</td>
<td>642</td>
</tr>
</tbody>
</table>
The 2009 PigCHAMP summaries for the United States and Canada show another year of improved productivity overall. The availability of vaccines to control Porcine Respiratory and Reproductive Syndrome (PRRS) has likely had a major impact on production results. While productivity as a whole is better, we still see a wide range of performance between the upper and lower percentile in various production parameters. For example, the top 10% of U.S. farms have a total born per litter average of 14.18 (compared to 13.80 last year); the lower 10% of farms have a total born per litter average of 11.51 (compared to 11.67). So in reality, the variation was greater in 2009 in this parameter than it was in 2008.

When looking at the charts below, keep in mind that “Upper 10 percentile” means the upper range for that production variable, not the upper percentile of farms.

### SUMMARY OF THE 2009 DATA

Fewer regional differences, but more variation is evident.

By Susan Olson

---

### USA 2009 - Annual summary

<table>
<thead>
<tr>
<th>CARE3000 variables</th>
<th>DOS variables</th>
<th>Mean</th>
<th>SD</th>
<th>Median</th>
<th>Upper 10 percentile</th>
<th>Lower 10 percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeat services</td>
<td>Number repeat services</td>
<td>326.25</td>
<td>307.261</td>
<td>222.50</td>
<td>766.00</td>
<td>89.00</td>
</tr>
<tr>
<td>% Repeat services</td>
<td>Percent repeat services</td>
<td>10.56</td>
<td>5.734</td>
<td>9.45</td>
<td>18.70</td>
<td>4.30</td>
</tr>
<tr>
<td>Total services</td>
<td>Total number of services</td>
<td>3810.61</td>
<td>3809.520</td>
<td>1803.50</td>
<td>7929.00</td>
<td>1053.00</td>
</tr>
<tr>
<td>Farrowings</td>
<td>Number of sows farrowed</td>
<td>3277.35</td>
<td>3486.340</td>
<td>1457.50</td>
<td>6832.00</td>
<td>771.00</td>
</tr>
<tr>
<td>Farrowing rate</td>
<td>Farrowing rate</td>
<td>81.24</td>
<td>7.109</td>
<td>82.52</td>
<td>88.97</td>
<td>71.24</td>
</tr>
<tr>
<td>Total born</td>
<td>Total pigs born</td>
<td>4293.59</td>
<td>4652.320</td>
<td>18060.00</td>
<td>91763.00</td>
<td>9530.00</td>
</tr>
<tr>
<td>Total born per litter</td>
<td>Average total pigs/litter</td>
<td>12.78</td>
<td>0.938</td>
<td>12.71</td>
<td>14.18</td>
<td>11.51</td>
</tr>
<tr>
<td>Total liveborn</td>
<td>Total pigs born alive</td>
<td>38120.44</td>
<td>41145.290</td>
<td>16728.50</td>
<td>80162.00</td>
<td>8795.00</td>
</tr>
<tr>
<td>Liveborn per litter</td>
<td>Ave. pigs born alive/litter</td>
<td>11.46</td>
<td>0.660</td>
<td>11.49</td>
<td>12.25</td>
<td>10.68</td>
</tr>
<tr>
<td>Liveborn/female/year</td>
<td>litters/Fem/yr * Ave. born alive/litter</td>
<td>25.44</td>
<td>2.830</td>
<td>25.86</td>
<td>28.72</td>
<td>21.78</td>
</tr>
<tr>
<td>Total stillborn</td>
<td>Total stillborn pigs</td>
<td>3005.79</td>
<td>3470.920</td>
<td>1437.00</td>
<td>7809.00</td>
<td>486.00</td>
</tr>
<tr>
<td>Stillborn per litter</td>
<td>Average stillborn pigs</td>
<td>0.88</td>
<td>0.503</td>
<td>0.88</td>
<td>1.24</td>
<td>0.50</td>
</tr>
<tr>
<td>Total mummified</td>
<td>Total mummified born</td>
<td>916.13</td>
<td>1229.010</td>
<td>327.50</td>
<td>2486.00</td>
<td>31.00</td>
</tr>
<tr>
<td>Mummified per litter</td>
<td>Average mummies/litter</td>
<td>0.23</td>
<td>0.168</td>
<td>0.21</td>
<td>0.41</td>
<td>0.02</td>
</tr>
<tr>
<td>Sows weaned</td>
<td>Sows farrowed &amp; weaned</td>
<td>3279.23</td>
<td>3483.910</td>
<td>1471.00</td>
<td>6851.00</td>
<td>778.00</td>
</tr>
<tr>
<td>Piglets weaned</td>
<td>Total pigs weaned</td>
<td>33157.79</td>
<td>35765.190</td>
<td>15011.00</td>
<td>71849.00</td>
<td>7666.00</td>
</tr>
<tr>
<td>Piglets weaned/litter</td>
<td>Pigs weaned/litter weaned</td>
<td>10.17</td>
<td>0.545</td>
<td>10.22</td>
<td>10.85</td>
<td>9.53</td>
</tr>
<tr>
<td>% Total losses liveborn</td>
<td>Pre-weaning mortality</td>
<td>12.16</td>
<td>3.451</td>
<td>12.15</td>
<td>16.06</td>
<td>8.31</td>
</tr>
<tr>
<td>Average weaned wt.</td>
<td>Ave. litter wean wt. (N=77)</td>
<td>151.55</td>
<td>176.658</td>
<td>133.99</td>
<td>151.61</td>
<td>105.56</td>
</tr>
<tr>
<td>Piglets age at weaning</td>
<td>Average age at weaning</td>
<td>19.80</td>
<td>1.409</td>
<td>19.75</td>
<td>21.35</td>
<td>18.23</td>
</tr>
<tr>
<td>Pigs weaned/sow/year</td>
<td>Pigs weaned/mated female/yr</td>
<td>23.40</td>
<td>2.862</td>
<td>23.57</td>
<td>26.39</td>
<td>20.46</td>
</tr>
<tr>
<td>Pigs weaned/female/year</td>
<td>Pigs weaned/female/year</td>
<td>22.21</td>
<td>2.650</td>
<td>22.53</td>
<td>25.15</td>
<td>18.93</td>
</tr>
<tr>
<td>Total boars</td>
<td>Ending boar inventory</td>
<td>10.33</td>
<td>44.578</td>
<td>3.00</td>
<td>15.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Sows added</td>
<td>Females entered</td>
<td>20.41</td>
<td>155.827</td>
<td>0.00</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Sows culled or sold</td>
<td>Sows and gilt culled</td>
<td>679.59</td>
<td>723.441</td>
<td>354.50</td>
<td>1604.00</td>
<td>149.00</td>
</tr>
<tr>
<td>% Cull/year</td>
<td>Culling rate (N=295)</td>
<td>47.64</td>
<td>13.664</td>
<td>47.48</td>
<td>64.11</td>
<td>31.84</td>
</tr>
<tr>
<td>Sows died</td>
<td>Sow and gilt deaths</td>
<td>119.04</td>
<td>151.468</td>
<td>57.00</td>
<td>325.00</td>
<td>22.00</td>
</tr>
<tr>
<td>% sow deaths/year</td>
<td>Death rate</td>
<td>7.98</td>
<td>2.849</td>
<td>7.79</td>
<td>11.43</td>
<td>4.75</td>
</tr>
<tr>
<td>Total sows</td>
<td>Ave. female inv. – Ave. gilt pool inv.</td>
<td>1389.75</td>
<td>1398.130</td>
<td>678.50</td>
<td>2854.00</td>
<td>352.00</td>
</tr>
</tbody>
</table>

Total farms used for summary = 296
In other words, for variables such as Repeat Services (%), Stillbirths (%), Preweaning mortality (%), Annualized cull rate (%), and Annualized mortality rate (%), the lower the number the more favorable it is. For variables such as Pigs/mated female/year, Farrowing Rate (%), Born alive/litter, etc., the higher the number, the better.

The summary indices of most interest are the range of performance estimates. Take a look at the major indicators. Whether in Canada or the United States, there is a wide range of performance that is not explained by location. Moreover, the capability to reach high levels of productivity appears to be similar across both industries.

Recognizing that the capabilities to excel are similar and the design of sow units does not differ greatly, it is mostly a function of the management within the farms. It may be useful to start looking at the availability of skilled labor for estrus detection and breeding, inspection and treatment frequency for sick sows, and the general effects of genotype and housing methods.

As we look at future changes in the industry, it is clear that poor performing herds will not survive in any market. It may very well be that financial pressures in both the United States and Canada have encouraged producers to put more emphasis on management and cost control. Regardless of these variables, all farms should recognize opportunities to improve within the ranges shown by this database.

All summaries, past and present are also located on the PigCHAMP website, www.pigchamp.com/benchmarking. Spend some time comparing your own benchmark numbers to the ones shown here. Careful analysis should provide the map to making future improvements.

Editor’s Note: Susan Olson is the Knowledge Center Manager for PigCHAMP, Inc.
GILT PERFORMANCE AND AVERAGE AGE AT BREEDING
A review of records from 2002 – 2008 provide an interesting snapshot.

By Sasha Gibson and Jayne Jackson

The swine industry has seen many changes in production systems over the last 15 years: the move to artificial insemination; split site production; and the increase in the average size of sow farms, to name a few. These changes have been driven by the need to keep up with consumer demands for uniform, high quality, safe pork products. The industry now requires skilled production workers, often with specific abilities within the farm production unit to meet this demand. On sow farms, employees monitor gilt performance and are responsible for decisions related to breeding and culling. Age at breeding and overall performance can have a significant impact on a producer’s bottom line.

This article provides insight on gilt performance in 2002, 2004, 2006 and 2008 on approximately 100,000 gilt breedings per year. Data was analyzed from the PigCHAMP® Knowledge Center Database using four PigCHAMP Care 3000 reports.

- Reproductive Loss Report
- Female Removal Analysis
- Age at First Service Analysis
- Repeat Service Analysis

Data was compiled from Minnesota, Ohio, Illinois, Indiana, Iowa, Michigan, Oklahoma, South Dakota, Nebraska and North Carolina.

GILT DEVELOPMENT
Historically, farms produced gilts internally or bought them, often at more than 200 pounds and at 150 days of age or more. These systems worked well for farms in many respects; gilts were transported to the farm at puberty and bred three weeks later. Many of these gilts came into heat four or five days after arrival at the farm (transport heat) and the burden of raising a viable gilt that would be prolific and have longevity in the herd was on an external supplier. Often an older gilt purchase was “guaranteed to breed.”

More recently, farms have moved to purchasing gilts at younger weights and ages (12 to 100 pounds; 18 to 70 days old). A reason for this change is the ability to stabilize the gilts to a herd’s disease profile (particularly PRRS). Whether farms internally multiply or purchase young gilts, they generally have a dedicated “Gilt Development Plan” that includes a separate set of buildings to raise animals other than within the finisher pig flow. These buildings are called Gilt Development Units (GDU), and their purpose is to maximize the performance potential of the gilt. This may be measured through:

- Total born and born alive (first litter / lifetime performance)
- Farrowing rates
- Pigs per sow/year
- Wean weights

Without time for gilts to become acclimated to a farm’s health situation it would be extremely difficult to have high performance in these parameters without a GDU. Other benefits of GDUs include the ability to influence the human/gilt experience before breeding, to feed a specialized set of diets to aid physical development, and to control exposure to boars.

WHAT THE GRAPHS MEAN
The higher percentage of gilt breedings shown in Figure 1 is likely a reflection of increased start up or depopulation units. Generally, replacement rates are targeted at 40 to 50% of the total sow unit each year, which means gilt breeds as a percentage of total breeds should be 20%.

Total animals sold were 444,826. Some improvement has occurred in the percentage of gilts that are sold from the unit, however 14% of the gilts that are entered into the herd never farrow (Figure 2).

The status of the gilts when they were culled has not changed between 2002 and 2008 (Figure 3). It is likely that the “in-pig” gilt data is really a reflection of multiple return gilts being culled that were found open but not recorded as such.

The farrowing rate achieved with gilts has improved over the seven years monitored (Figure 4), with a 10% increase occurring within the 2006 to 2008 time period. Managing the gilt by age is one of the common management tools often used in GDUs. The percentage of herds that record gilt ages has improved since 2002, possibly suggesting that management recognizes age as one of the parameters for successful gilt...
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breeding. Total born and born alive numbers have improved by one pig from 2002 to 2008 on gilts that had age recorded.

Breeding age has fluctuated over the last seven years (Figure 5). Born alive and farrowing rates have improved from 2002 to 2006. However, born alive and farrowing rates from 2006 to 2008 have remained the same, even though there was an increase of 34 days on the average breeding age of the gilts.

**GOOD PROGRESS, BUT ROOM FOR IMPROVEMENT**

Improvements in the performance of gilts have occurred in the ten states reviewed. Farrowing rate, total born and live born have increased by one pig per gilt farrowed. However, Figure 2 shows us that 14% of the gilts never farrow and this number has not improved over the last four years. Nonproductive gilts that ultimately get culled have economic consequences to the farm. Purchase price or internal multiplication price, feed, vaccinations, and AI costs are all lost for this group, in addition to labor and facility costs.

In 2008, 61% of the gilts bred had age recorded. While this figure has improved, it suggests that many producers are not using age as a tool to manage gilt performance. The data presented from 2008 shows no difference in performance between 242 and 276 days at first service. Retention rates on this data need to be reviewed. Do older gilts at breeding (>276 days) have less or more chance of being culled? Further study of data by state, age and arrival interval is needed to understand the relationships.

Record keeping systems like PigCHAMP® Care 3000 help producers collect and analyze data. The four PigCHAMP reports used in this study can be helpful in identifying areas of opportunity. This leads to increased performance and decreased costs as retention rates improve. The ability to identify the most productive age at breeding for a farm system is key to economically efficient production.

**Editor’s Note:** Sasha Gibson, HND, MS is with the Fairmont Veterinary Clinic in Fairmont, Minn. She gave a presentation on this topic at the 2010 annual meeting of the American Association of Swine Practitioners. Jayne Jackson is a project manager at PigCHAMP, Ames, Iowa.

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**Figure 2:** Percentage of Parity 0 Females Sold Out of the Herd
Data Source: PigCHAMP® Care 3000 Female Removal Analysis

**Figure 3:** Status of Parity 0 at Culling
Data Source: PigCHAMP® Care 3000 Female Removal Analysis

**Figure 4:** % of Gilts With Age Recorded, Average Farrowing Rates and, Total Born
Data Source: PigCHAMP® Care 3000 Age at First Service Analysis

**Figure 5:** Recorded age at first service
Data Source: PigCHAMP® Care 3000 Age at Frist Service Analysis

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TYING THE TRAITS TOGETHER
Researchers look at the associations of body composition, growth and structural soundness traits with sow lifetime reproductive performance.

By Marja Nikkilä, et al.

Over the past 10 years, the average culling frequency of breeding herd females in U.S. commercial swine herds has been 45% and the average sow mortality rate has been 8% (PigCHAMP™). The primary culling reasons reported for young sows are reproductive failure and leg problems. Therefore, the maintenance of acceptable reproduction rates in young females and the selection of structurally sound replacement females are important factors in increasing sow lifetime reproduction. Certainly there are correlations between physical traits and sow longevity but what are they? The purpose of this study was to estimate the genetic parameters for body composition, growth, structural soundness and lifetime reproductive traits in commercial females.

**MATERIALS AND METHODS**
This study involved 1,447 commercial females from two genetic lines: roughly one-third of the females belonged to a grandparent line and the balance to a parent line. They were progeny of 58 known sires and 835 dams. The evaluation of body composition and structural soundness was carried out on 14 separate dates, and the gilts averaged 124 ± 24 lbs. body weight and 190 ± 7 days of age at evaluation.

Body composition traits included ultrasonically measured loin muscle area, 10th rib backfat and last rib backfat. Ultrasonic images were taken by a single technician who was certified by the National Swine Improvement Federation (Bates and Christian, 1994).

Evaluation of structural soundness included body structure (body length, depth and width, rib shape, top line and hip structure), front leg structure (legs turned, buck knees, pastern posture, foot size and uneven toes), rear leg structure (legs turned, weak/upright legs, pastern posture, foot size and uneven toes) and overall leg action. Evaluation was completed independently by two scorers using a nine-point scale.

Lifetime reproductive traits included lifetime (L), percentage non-productive days from total herd days (NPD%), lifetime number born alive (LBA) and number born alive per lifetime days (LBA/L).

**STATISTICAL ANALYSIS**
The heritabilities were estimated with multivariate and the genetic correlations with bivariate animal models (Madsen and Jensen 2008). The statistical model for growth and body composition traits included

<table>
<thead>
<tr>
<th>Lifetime reproductive traits</th>
<th>L</th>
<th>NPD%</th>
<th>LBA</th>
<th>LBA/L</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body composition / growth</strong></td>
<td>3.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adjusted loin muscle area</td>
<td>-0.69 ± 0.20</td>
<td>-0.16 ± 0.19</td>
<td>0.33 ± 0.17</td>
<td>0.24 ± 0.18</td>
</tr>
<tr>
<td>Adjusted 10th rib backfat</td>
<td>0.16 ± 0.20</td>
<td>0.37 ± 0.19</td>
<td>0.14 ± 0.19</td>
<td>0.14 ± 0.19</td>
</tr>
<tr>
<td>Last rib backfat</td>
<td>0.23 ± 0.19</td>
<td>0.38 ± 0.19</td>
<td>0.18 ± 0.19</td>
<td>0.18 ± 0.19</td>
</tr>
<tr>
<td>Adjusted days to 113.5 kg</td>
<td>0.58 ± 0.17</td>
<td>0.50 ± 0.20</td>
<td>0.47 ± 0.18</td>
<td>0.33 ± 0.20</td>
</tr>
<tr>
<td><strong>Body structure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Body length</td>
<td>-0.72 ± 0.21</td>
<td>0.61 ± 0.22</td>
<td>-0.63 ± 0.21</td>
<td>-0.56 ± 0.23</td>
</tr>
<tr>
<td>Body depth</td>
<td>-0.28 ± 0.24</td>
<td>0.14 ± 0.25</td>
<td>-0.20 ± 0.23</td>
<td>-0.06 ± 0.24</td>
</tr>
<tr>
<td>Body width</td>
<td>0.53 ± 0.22</td>
<td>-0.10 ± 0.26</td>
<td>0.34 ± 0.23</td>
<td>0.11 ± 0.25</td>
</tr>
<tr>
<td>Rib shape</td>
<td>-0.40 ± 0.36</td>
<td>0.31 ± 0.35</td>
<td>-0.12 ± 0.36</td>
<td>0.02 ± 0.35</td>
</tr>
<tr>
<td>High top line</td>
<td>0.22 ± 0.32</td>
<td>0.00 ± 0.31</td>
<td>0.26 ± 0.30</td>
<td>0.25 ± 0.30</td>
</tr>
<tr>
<td>Weak top line</td>
<td>-0.42 ± 0.25</td>
<td>0.52 ± 0.24</td>
<td>-0.29 ± 0.24</td>
<td>-0.18 ± 0.25</td>
</tr>
<tr>
<td><strong>Front leg structure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Front legs turned</td>
<td>0.48 ± 0.27</td>
<td>-0.44 ± 0.28</td>
<td>0.59 ± 0.24</td>
<td>0.66 ± 0.22</td>
</tr>
<tr>
<td>Buck knees</td>
<td>0.13 ± 0.33</td>
<td>-0.10 ± 0.31</td>
<td>0.20 ± 0.31</td>
<td>0.30 ± 0.30</td>
</tr>
<tr>
<td>Weak front pasternsf</td>
<td>-0.08 ± 0.26</td>
<td>0.23 ± 0.25</td>
<td>-0.05 ± 0.25</td>
<td>-0.11 ± 0.24</td>
</tr>
<tr>
<td>Upright front pasternsf</td>
<td>-0.47 ± 0.31</td>
<td>0.33 ± 0.33</td>
<td>-0.31 ± 0.32</td>
<td>-0.22 ± 0.33</td>
</tr>
<tr>
<td>Front foot size</td>
<td>-0.04 ± 0.30</td>
<td>0.05 ± 0.30</td>
<td>0.01 ± 0.29</td>
<td>-0.12 ± 0.28</td>
</tr>
<tr>
<td>Uneven front toes</td>
<td>-0.00 ± 0.32</td>
<td>0.19 ± 0.31</td>
<td>0.06 ± 0.31</td>
<td>-0.01 ± 0.31</td>
</tr>
<tr>
<td><strong>Rear leg structure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rear legs turned</td>
<td>-0.30 ± 0.27</td>
<td>0.16 ± 0.28</td>
<td>-0.16 ± 0.26</td>
<td>0.05 ± 0.27</td>
</tr>
<tr>
<td>Weak rear legsf</td>
<td>0.19 ± 0.40</td>
<td>-0.34 ± 0.36</td>
<td>0.52 ± 0.36</td>
<td>0.44 ± 0.34</td>
</tr>
<tr>
<td>Upright rear legsf</td>
<td>-0.38 ± 0.27</td>
<td>0.58 ± 0.24</td>
<td>-0.43 ± 0.25</td>
<td>-0.55 ± 0.23</td>
</tr>
<tr>
<td>Weak rear pasternsf</td>
<td>-0.28 ± 0.24</td>
<td>0.11 ± 0.25</td>
<td>-0.14 ± 0.24</td>
<td>-0.02 ± 0.24</td>
</tr>
<tr>
<td>Upright rear pasternsf</td>
<td>-0.43 ± 0.35</td>
<td>0.59 ± 0.35</td>
<td>-0.38 ± 0.35</td>
<td>-0.47 ± 0.34</td>
</tr>
<tr>
<td>Rear foot size</td>
<td>0.51 ± 0.25</td>
<td>-0.39 ± 0.29</td>
<td>0.47 ± 0.25</td>
<td>0.37 ± 0.27</td>
</tr>
<tr>
<td>Uneven rear toes</td>
<td>-0.13 ± 0.31</td>
<td>-0.30 ± 0.28</td>
<td>-0.20 ± 0.29</td>
<td>0.00 ± 0.29</td>
</tr>
<tr>
<td><strong>Overall leg action</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall leg action</td>
<td>0.11 ± 0.33</td>
<td>-0.21 ± 0.31</td>
<td>0.19 ± 0.31</td>
<td>0.27 ± 0.30</td>
</tr>
</tbody>
</table>
composition traits included genetic line and evaluation day as fixed effects and the animal as a random effect. Prior to analyzing, standard formulas published by NPPC were applied to adjust loin muscle area, 10th rib backfat and the number of days to a constant body weight of 250 lbs. On the other hand, for last rib backfat, weight at evaluation was used as a linear covariate. Structural soundness traits were analyzed with an identical model to last rib backfat, except scorer was included as an additional fixed effect. Top line, front and rear pastern postures and weak/upright rear legs were each divided into two traits prior to analyses due to intermediate optimum. Turned front and rear legs were expressed as a deviation from the intermediate optimum. The model for lifetime reproductive traits had the genetic line and herd entry group as fixed effects and the animal as a random effect.

At the termination of data collection, 14% (n = 199) of females were alive. Therefore, preliminary analyses have been implemented using Gibbs sampling procedures allowing incorporation of censored records.

**SUMMARY OF RESULTS**

The heritability estimates were obtained with multiple trait animal models. The estimates were high for growth and body composition traits and low to moderate for structural soundness traits and lifetime reproductive traits. Most of the genetic correlations of growth, body composition and soundness traits with lifetime reproductive traits were low and non-significant (P > 0.05). In general, loin muscle area and body structure traits had a non-significant trend of being favorably associated with lifetime reproductive traits, while an unfavorable trend was observed in the associations of backfat and days to 250 lbs. body weight with lifetime reproduction.

The strongest associations with lifetime reproductive traits were obtained for days to 250 lbs. body weight, body length, rib shape, turned front legs and upright rear legs. However, these results need to be interpreted within the distributions of observations present in the dataset. The total range for days to 250 lbs. body weight was 144 - 227 days, with 84% of females reaching the weight by 190 days of age. For body length, 89% of observations were divided into scores 4 – 6 (5 describing intermediate length). For rib shape, the observations were distributed normally over the entire 9-point scale. After transforming records of turned front legs into deviations from optimum, 79% of observations were distributed into two best scores. For upright rear legs, 89% of observations were distributed into two best scores after separating weak/upright rear legs into two traits.

**POINTS TO CONSIDER**

The animals included into the study were preselected for their growth potential and structural soundness by the genetic supplier, which is likely to introduce some bias to these estimates. The genetic correlations obtained in this study indicate that in terms of improving sow lifetime reproductive performance and hence the profitability for pork producers, the most important gilt body composition, growth and structural soundness traits in commercial replacement gilt selection would be closer to intermediate growth rate and body length, more shaped ribs, slightly outwards turned front legs and less upright rear legs. These results need to be interpreted within the distributions of observations present in the dataset.

*Editor’s Note: Marja Nikkilä is a graduate research assistant at Iowa State University. Other contributors (also at Iowa State University) are Benny Mote, graduate research assistant; Ken Stalder, professor; Timo Serenius, post doctoral research associate; Max Rothschild, distinguished professor; Anna Johnson, assistant professor; and Locke Karriker, assistant professor, Veterinary Department of Production Animal Medicine, Iowa State University. Other contributors are Jay Lampe, Swine Graphics Enterprises; and Bridget Thorn, Newsham Choice Genetics. The authors acknowledge the National Pork Board for funding this study; the cooperation of Newsham Choice Genetics for supplying the gilts used in the trial; and Swine Graphic Enterprises, for farm management and data collection. Other funding was provided by the State of Iowa and Hatch funding.*
In 2009, the hog industry was shocked with the outbreak of H1N1 virus, also commonly known and misconceived as “Swine Flu.” Historically, diseases of this sort that seem to be tied to a commodity linger for 3 to 4 months but usually pass with time. That is exactly what happened. Last year, by the time the end of August rolled around, someone rang the bell at the bottom and the CME Lean hog futures never looked back.

It almost looked like a repeat of 1998 in terms of how low prices would go, but the December 2009 futures contract hit a low of US $43/cwt only to rebound from these depressed levels and closed out at US $64.57/cwt.

No one expected demand to be as good as it was, particularly after experiencing one of the worst recessions since the depression of the 1930’s. With more time came higher prices and as we entered 2010, U.S. supply was tracking 5.0% lower than the December Quarterly Hogs and Pigs Report was suggesting (a drop of 2.5-3.0%).

A lack of good quality corn caused hogs to go to market lighter, thus providing for lower supplies. In addition, a few winter storms caused transportation issues, artificially causing the U.S. pork carcass cutout to achieve its highest-ever January level at US $79/cwt. (See Pork Carcass Cutout Chart)

No wonder pork belly and hog futures are considered some of the most volatile commodities in the world.

SO NOW WHAT?
Many economists remain bearish, as supply has not liquidated enough to create long-term profitability and sustainability in the pork industry. Enter demand once again in late 2009/2010. Even with a global recession and China out of the market, export demand continued to improve as 2009 wore on.

With the worst behind us, a combination of lower supplies and higher demand is causing historically high CME lean hog futures. For example June hog futures have achieved a high of US $85.60/cwt so far in 2010. June is now trading at the 97.18% of its historical range. This simply means there is a 2.82% probability that prices may go higher but a 97.18% chance that prices may move lower. At these lofty levels the risk is high if a producer decides to do nothing and sell into the cash market. (See Monthly Nearby Lean Hogs Chart)

Historically, hog futures have rarely seen prices much higher than US $90/cwt, except for the June 2009 futures contract when on July 3, 2008 it rallied to a record high of US $100.25/cwt. Seasonally, we usually enter highs in late May and early June every year, but there is always an exception to the rule, like 2009.

LOOKING FORWARD
Is 2010 going to be placed into the record books? With time on our side we may just do it, but the global economy needs to continue to recover. With a 4.5% GDP growth and improving consumer confidence, this could create enough demand to achieve higher prices. This is welcome news after what many producers experienced last year. Many want to forget 2009 but expansions plans are now being rumored once again. This will be premature as many banks are not really in the mood to lend money – which is good news for the industry right now.

Feed prices have remained in check and overall cost of production is lower, allowing pork producers to finally lock in profits for the spring, summer and fall/winter months of 2010. Fear was rampant in 2009 but greed seems to be the name of the game in 2010.

Remember, the futures market is about expectations at some point in the future and current summer 2010 hog futures have already factored in better export demand and lower supplies due to seasonality. The risk moving forward is not that a producer will leave US $5-10/cwt on the table by booking hogs at current prices. Rather, it is consideration of
the downside risk. What if prices fall US $10-20/cwt? In 2005, June hog futures rallied to US $82/cwt by the end of February and by the time the contract expired it closed out at US $68/cwt, a US $14/cwt drop or US $28/head fall.

**FINAL THOUGHTS**

There is more downside risk from current levels but no one ever gets hurt taking a profit. As the old saying goes, “Bulls make money, bears make money, and pigs get slaughtered.” Many people were surprised with the v-shape recovery in the economy last year and we may be just as surprised with the strength in the hog market in 2010.

Finally, some last words of wisdom: Sell on strength – markets can be irrational a lot longer than you or I can stay solvent and “a fool with a plan with always beat a genius with no plan.”

*Editor’s Note:* Moe Agostino is a Managing Commodity Strategist for Farms.com Risk Management. For more information on managing risk in your crop and/or livestock operation, contact Moe at: moe.agostino@farms.com. To learn more about the markets, go to: www.riskmanagement.farms.com

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ACHIEVING 30 PIGS/SOW/YEAR
Key differences exist in high producing farms.

By John T. Waddell

In North America, we have come to respect the Danes for their extremely disciplined approach to pig production but have at the same time tended to discount some of their outstanding production figures due to the fact that these were typically small farms. Regardless of geographical location, we all operate under the same constraints when it comes to reproductive efficiency. If “pigs weaned per female per year” is the measure we choose to employ, then the productivity tree has the same components (Figure 1).

Since gestation length cannot be readily manipulated and shortening lactation length has detrimental effects on subsequent litter size, the number of litters per female per year is less likely to be the branch of the productivity tree that yields the greatest potential improvement in pigs weaned per female per year. The seemingly largest potential to increase the number of pigs weaned per female per year comes in the weaned per litter branch (Polson, 1992).

The economic feasibility of “chasing” the 30 pigs per sow per year goal has been questioned in the past. For example, what is the value of weaning 30 pigs per sow per year if the quality and performance of those pigs is demonstrably inferior to pigs weaned from a less aggressive approach in the overall economic performance of the production system? The Danes recognized this dilemma as they selected for larger and larger litter size and then shifted the emphasis of selection for survivability at five days of age (Su et al., 2007).

The quest continues to maximize reproductive performance while optimizing the quality, size and performance of the pigs weaned. This article will identify the obstacles to achieving 30 pigs per sow per year and show how innovative producers and their advisors are overcoming these obstacles.

It should be obvious that there are no short cuts or quick fixes that will suddenly jump a farm’s production to these high levels. In a similar vein, it is unlikely that any single management change would make a huge difference on a farm that is not committed to other important aspects and practices. In other words, it is unlikely that these techniques can be “cherry picked” or applied piecemeal to get expected results. In the end, dedication and discipline in execution of hundreds of daily details allow farms to reach and achieve formerly unimaginable levels of production.

GENETICS

The industry has made huge strides in selection for large litter size. Fourteen pigs total born is becoming commonplace with one benchmarking database reporting the top 5% of over 600 farms with a potential for over 35 pigs born per mated female per year. This calculates to over 14.5 pigs born per female farrowed. (Rix and Ketcham, 2009) Even the top 10% of this database is above 14 total born per litter (Figure 2).

While the influence of European genetics are being seen in North America, some of the selection programs have continued to select for litter size with annual improvements of over a quarter of a pig per litter per year. New methods of genomic selection have led some to predict additional gains in litter size over the next decade to achieve live born averages topping 19 pigs per litter (Rathje, 2009).

Of course, huge gains in litter size have not come without a cost. As the Danish industry pushed up litter size to 14 and beyond, they discovered an increase in variation within litters with the number of small, less viable pigs creating challenges for survivability. Researchers discovered that by selecting for the number of pigs remaining alive at five days of age, they could indirectly select away from smaller, less viable pigs and improve piglet survivability throughout lactation (Su et al., 2007). Since selection for this trait began in 2004, the Danes have demonstrated an improvement
of nearly two pigs per litter at five days of age. Maximizing heterosis by utilizing an F1 crossbred female is essential for capturing maximum genetic potential.

GILT DEVELOPMENT

Gilt development may account for some of the biggest improvements in production the North American industry has reaped in the previous five years and has often been the most neglected on many farms. With culling rates of 30-50%, gilts may represent nearly a fourth of all litters. Even minor improvements in gilt productivity can substantially impact the reproductive performance of the entire herd and the longevity and productivity of the individual female. In attempts to keep non-productive days at a minimum by breeding gilts younger, we have inadvertently reduced both their litter size and longevity in many cases. A happy medium has been reached by allowing gilts to reach at least 300 lbs. live weight or 240 days of age prior to mating. Gilts should never be bred on their first estrus cycle but there appears to be little or no economic advantage to waiting beyond the second or third cycle for their first mating.

Gilt isolation and acclimatization are an essential part of every production system. Gilts should be housed in pens or stalls allowing approximately 13-15 sq. ft. per animal. Contrary to practices in North America, a common practice in Denmark is to limit (actually eliminate) boar exposure at any time in the gilt’s life prior to actually mating. Gilts should never be bred on their first estrus cycle but there appears to be little or no economic advantage to waiting beyond the second or third cycle for their first mating.

As cycling gilts are detected, the caretaker chalks or color sprays their backs to create a color coded mark. Three colors are used to identify the gilts in heat and the colors are rotated between the three weeks of the normal gilt cycle. For example, all gilts found in heat in this week will receive a blue mark, next week they will be marked red and the following week green. This marking system allows the breeding manager to select from those gilts likely to cycle in a given week so as to reduce the number of gilts needing to be held at the sow unit prior to mating. Once per week, the gilts that have been marked to cycle within the coming week are moved to the sow unit at the beginning of the week they are to be mated, creating a “just in time” type of flow (Thomsen, 2004).

AGE AT FIRST MATING

The Danish gilt’s age at first mating tends to be at least a month older than what is considered normal in North America. The Danes have shown that there are significant reproductive efficiencies to be gained by waiting until gilts are at least 8 months of age regardless of weight.

As cycling gilts are detected, the caretaker chalks or color sprays their backs to create a color coded mark. Three colors are used to identify the gilts in heat and the colors are rotated between the three weeks of the normal gilt cycle. For example, all gilts found in heat in this week will receive a blue mark, next week they will be marked red and the following week green. This marking system allows the breeding manager to select from those gilts likely to cycle in a given week so as to reduce the number of gilts needing to be held at the sow unit prior to mating. Once per week, the gilts that have been marked to cycle within the coming week are moved to the sow unit at the beginning of the week they are to be mated, creating a “just in time” type of flow (Thomsen, 2004).
and carry more back fat to endure five weeks of lactation and still be expected to return to heat and have an increased litter size in their second litter.

To enable an older age at first mating, the farm must build “slack” into the gilt isolation and acclimatization facility to make it possible to skip heats on younger animals when larger numbers of females are needed in any given week. To avoid “holes” in production, the urge is to mate younger and younger gilts. By allowing additional space in the gilt development units and maintaining a larger inventory of breeding aged gilts, the producer is not tempted to dip into the younger gilt pool for the sole purpose of meeting a weekly breeding target (Thing, 2004).

CHALLENGING FIRST LITTER GILTS AND LACTATION LENGTH

One of the most unique production management tools used in Denmark is how they challenge first litter gilts. Management strongly believes that unless gilts are “challenged” to produce strongly at first parity, these females will be less productive throughout their lifetime. The farrowing personnel aggressively use cross-fostering early in the piglet’s life to bring all gilt litters to 13 piglets. These top farms average over 14 pigs born alive per litter, allowing the farrowing manager leeway in adjusting the number of piglets each gilt and sow nurses. While the gilts always receive 13 piglets on day one, sows are typically only given 12 pigs to nurse.

What happens to all the extra piglets from a farm averaging over 14 born alive? The average weaning age for the entire farm was around 24 days. Parity 2 (and higher) sows are only lactated for about 21 days and are then weaned. Gilts on the other hand, are allowed to nurse their first litter for about three weeks and then “their” pigs are weaned with others of the same age (21-24 days). Then, instead of discontinuing the lactation of the first litter gilts, they are left in the farrowing stall and are given another litter made up from piglets at the end of their first week of age. These litters are transferred intact from second litter sows.

The second litter sows, in turn, receive piglets from various litters of older sows replacing the litter that was nursed off to the gilts whose litters were weaned.

The end result is that all pigs are weaned around three weeks of age but all the first litter gilts lactate for almost five weeks, weaning not only their own litter but a second litter transferred from a parity 2 sow. This is the essence of “challenging” the gilts (Jensen, 2004).

The longer lactation lengths in Denmark also lead to larger litter sizes on subsequent litters. One rule of thumb is that for each additional day of lactation, the litter size increases on the subsequent litter by 0.1 pigs. The biology of this phenomenon has yet to be clearly understood but a recent increase in weaning age in the United States appears to coincide with increases in litter size.

INVENTORYED FEMALE TO FarrowING STALL RATIO

Denmark has another unique situation regarding farrowing space - they have lots of it! Having never made the transition to early weaning, many producers maintained the existing farrowing stalls when they expanded, and these became the extra spaces needed to challenge first litter gilts. New facilities are built with older weaning age in mind and thus have an abundance of space versus what we typically see in North America. Where the typical three-week weaning age farm in North America has a ratio of 6.25 inventoried females per farrowing stall, it is not unusual to find ratios of less than 4.5 inventoried females per farrowing space in Denmark. Some farms have created a “just in time” flow with the gilts since they enter the sow herd only in the week they are expected to be in heat, which tends to deflate the ratio somewhat. The low sow inventory to farrowing stall ratio offers them a unique opportunity to adjust wean age to fit their desired lactation length, and is thus less dependent on the breeding target.

As for breeding targets, the Danes routinely create farrowing targets utilizing a 90% farrowing rate and since they are required by law to wean beyond 21 days of age, they resist the urge to over-breed.
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“The top farms in Denmark employ highly trained, motivated and detail-oriented people who are on a mission to exceed 30 pigs per sow per year. Targets for various production parameters are clearly outlined and the current and prior weekly production numbers are prominently displayed. Employees are routinely rewarded for outstanding performance based on the entire farm’s production.”

– Dr. John Waddell, Sutton Veterinary Clinic

CULLING POLICY AND PARITY STRUCTURE
Since the Danes are so driven to excel at producing pigs weaned per sow per year, they are acutely aware of the importance of maintaining genetic improvement and reducing genetic lag. At the farm level on the high producing farms, rarely are sows allowed to remain in the herd after eight litters and generally sows are removed after six litters. Continuous genetic improvement is expected with each generation but since sows peak in production in parity 3 to 5, they target 50% of the inseminated females to be within this parity spread.

Typically, the culling policy is a “two strike” approach. The farm will allow a sow or gilt to remain in the herd (if she is physically sound) beyond one instance of a drop in litter size, but not after a second “strike.” The culling criteria are multi-factorial and include some subjective factors such as temperament or disposition. Generally, sows are expected to produce litters of at least 15 live pigs. They may excuse a sow for a single litter of fewer than 15 if she has other redeeming traits such as good milking ability as evidenced by weaning a large litter of heavy pigs. There are a few exceptions, and each sow and situation is considered on an individual basis. Simply stated, sows are given another chance if weekly breeding targets or her other data deem it necessary (Thing, 2004).

At times the culling decision is made prior to farrowing. The piglets from these sows are used as “extra” pigs to replace the litters of the sows who gave up their litters to the first litter gilts. Approximately 5% of each weekly farrowing group includes sows that will contribute their pigs to other sows and be marked for culling without weaning their pigs. Overall, the Danes practice aggressive culling with the goal of continuous improvement.

THE PEOPLE FACTOR
The top farms in Denmark employ highly trained, motivated and detail oriented people who are on a mission to exceed 30 pigs per sow per year. Targets for various production parameters are clearly outlined and the current and prior weekly production numbers are prominently displayed. Employees are routinely rewarded for outstanding performance based on the entire farm’s production. If someone hears of a farm that excels in production, they will attempt to emulate it. Veterinarians and consultants are continually challenged to bring new ideas on how to improve production and everyone at the farm has a ravenous appetite for new information (Mikkelsen, 2004).

Farms sustaining 30 pigs per sow per year are commonplace in Denmark, with some reaching 35 pigs per sow per year. Incorporating similar management practices may allow North American producers to achieve these same high levels of productivity.

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Mikkelsen, A. Personal communication with veterinary consultant of Christiansminde Multisite K/S. An associate veterinarian with Danvet, Hobro, DK, June 2004.
Thomsen, K. Personal communication with breeding manager of Christiansminde Multisite K/S, Aalborg, DK, June 2004.
Looking for one spot on the web to get all of your swine information? Visit: www.Swine.Farms.com

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My partners and I at Swine Vet Center work diligently with clients to maximize efficiency (i.e., produce the most pigs at the lowest cost), and strive to make them “best profit producers.” In reality, these things should always be done but with the current financial crisis, producers must continually look for every way possible to achieve efficiency. Following are the areas we feel are most important.

PERFORMANCE INDICATORS

Death Loss: Death loss must get back to pre-1998 levels. The Circovirus vaccine has had a tremendous effect since 2006, leading to reduced death loss, improved average daily gain (ADG), improved immune capability of the pig, and generally some of the best health we’ve seen. Once again, we are seeing 1% death loss or less in the nursery and 2% death loss or less in the grow-finish phase. We are even seeing some wean-to-finish death loss at 2-3%.

Total Born/Born Alive: Producers must achieve high total born/born alive numbers to maximize the efficiency of the sow herd. Most genetics are now capable of achieving over 14 total born and over 13 born alive. Herds should be achieving these numbers to produce a cost-competitive weaned pig.

Pigs per Sow per Year (PSY): We are starting to see herds consistently achieve 30 PSY and we feel farms should be in the 27-29 PSY range. Achieving numbers above that benchmark is exceptional and below that number means it’s time to figure out why. Achieving high PSY lowers the average cost of the weaned pig.

Gilt Performance: Over the past 5-6 years, producers have focused on better gilt production. Gilts have tremendous potential and their performance can be very consistent when managed correctly. It is not uncommon to see 13.5 total born and 93-94% farrowing rates on gilts.

GO FOR BEST BIOLOGIC PERFORMANCE

Stocking Density: Many farms have been double and even triple stocking wean-to-finish barns or early phase nurseries. Pigs have a higher chance of becoming infected because crowding affects biologic performance. In this time of low profit margins, spread your pigs out and give them the proper amount of space so they can achieve their best biological gain.

Weaning Age: A large percentage of our farms have gone to an older wean age (22-24 days). With the increased total born/born alive seen on today’s farms, weaning at 16-19 days produces too many small pigs that have trouble surviving the grow-finish phase. It is unprofitable to feed these small pigs high-priced corn. An older weaning age gives you bigger pigs that...
will survive the grow-finish phase, and these are full-value pigs. Most of the research in wean age has been done on the improvement in grow-finish, but we are also seeing tremendous improvement in reproductive efficiency. Sows have increased farrowing rates, increased total born, decreased wean-to-first-service interval, decreased non-productive days, increased pigs weaned/sow and increased weaning weight. All of these are very important to overall profitability of the sow farm.

**Single-Filling Wean-to-Finish:** A big savings related to single filling is less transportation to haul feeder pigs. Less transportation also means less labor for loading/handling, washing barns, and washing trucks. This also yields better performance because you have shorter

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**HEALTH TREATMENTS**

**Challenge Extra Treatments:** Producers are re-evaluating extra shots, such as premium antibiotics at processing and at weaning. They are also doing the same for water and feed medications. In the past, we routinely put in antibiotics post-weaning or pulse water medication at 2-3 weeks into the nursery, but now we are re-evaluating whether these practices are necessary. We also re-think treatments given to low- or non-viable piglets.

**Target Treatments:** Rather than adding feed medication to one entire ration, we are re-diagnosing disease and selecting the right drug (and often the cheaper drug) and are making sure it’s used at the correct time. We want to change antibiotic use from a shotgun approach to that of a guided laser.

**Use More Injectable Products:** We constantly remind producers that they will spend less money and will be more effective with early identification and treatment of pigs via injection vs. mass treatment of pigs through the feed or water.

**Review Vaccination Protocols:** Look for opportunities to save costs in this area. We are reducing PLE (Parvo-Lepto-Erysipelas) vaccination on older sows. Pre-farrowing vaccine usage for scours has also been reduced where there is a good feedback program in place. Many pre-farrowing shots will also occasionally abort animals, so we’re taking less of that risk.

**Euthanize Pigs with No Chance of Making Full-Value Pigs:** This practice can start and be implemented in all stages of production. The sooner these pigs are recognized and dealt with, the less costly they are. Consider this management practice for pigs that are small and weak at birth (less than 1.5 lbs.); substandard or small at weaning (less than 6 lbs.) or feeder pigs that are less than 20 to 25 lbs. We end up spending too much time, medication and labor in the grow-finish phase, only to euthanize these poor-doing pigs at a big loss.

**Problem Diseases:** There are some diseases that we just should not have anymore. They should be eliminated while we have the opportunity in a down market. Examples include swine dysentery, APP (*Actinobacillus pleuropneumoniae*), atrophic rhinitis, and possibly Porcine Reproductive and Respiratory Syndrome (PRRS) and Mycoplasma in low-density pig areas.

**Porcine Reproductive and Respiratory Syndrome (PRRS) Management:** You must have a very manageable PRRS program. In our practice, we see PRRS-free sow herds located out of the southern Minnesota - northern Iowa hog-dense areas. It’s amazing that in the last 5-10 years, producers have learned how easy it is to eliminate PRRS from a herd and with normal biosecurity measures, they are able to keep PRRS out of the herd if they are not located in a hog-dense area. In hog-dense areas, you must have a dedicated GDU (gilt development unit) where you can expose the gilts to your strain of PRRS to get them PRRS-positive and immune. We normally use some type of vaccine in the sow herd to try to keep ongoing immunity at an elevated level.

**Grow-Finish PRRS Control:** The goal of sow farm programs is to produce a negative pig, either from a positive stable herd or from a negative herd. These pigs that are put on feed in southern Minnesota, northern Iowa or any hog-dense area have tremendous risk of lateral PRRS exposure, so we commonly vaccinate them with a modified live vaccine to reduce any high death loss. This protocol has been used for 2-3 years on millions of pigs and I believe it has been quite successful.

**Barn Filtration:** With the knowledge gained about filtration, it appears the cost of filtration can be recaptured by eliminating just one PRRS event. This becomes a significant return on investment if implemented in high-density problem areas. PRRS is the most expensive disease we deal with in the swine industry and it has been for quite some time. I am disappointed that we haven’t taken better advantage of the present financial crisis to have a North American PRRS Eradication Program.
“Pigs held off feed from 12 to 18 hours prior to slaughter will suffer less transportation losses and will provide a better carcass, so not only do you save that feed cost, but you have better meat quality as well. This can be a significant savings for farms.”

— Dr. Tim Loula, Swine Vet Center

fill times and nutritional needs are often better met in a single-fill vs. a double-fill.

**Ranking Operators and Fixing/Removing the Bottom Percentage:** 60% or more of pork production costs are feed cost, and 60% of the feed cost is incurred during the grow-finish phase. So, improving the efficiency of the grow-finish phase is paramount to improving the “bottom line.” Many systems with multiple finishing sites have some poor operators. These operators may have built barns solely to have access to the manure for fertilizer value with very little interest in caring for the pigs effectively. We are trying to eliminate these operators from our clients’ systems. We either train them, change their habits, or remove them from the list.

**Producing and Marketing Full-Value Pigs:** Most producers sell under some kind of matrix or box-type formula, where they get premiums for pigs in the desired weight and carcass characteristics range. Obviously production practices must allow you to produce a high level of full-value pigs with the goal at 94-95% of all pigs weaned falling into this category. But it’s not only production; it also involves marketing. Selecting the right pigs for every load is critical. Proper handling of pigs during loading and trucking to reduce death loss during this process is also critical.

“Right-Sizing” the Farm: This goes along with weaning age and finishing space requirements, etc. We are running computer models with our clients to make sure we’re not pushing the system and thereby hurting biological efficiency.

**FEEDS AND FEEDING**

**Automatic Lactation Feeders:** The majority of our clients use these feeders now. Very little feed wastage occurs with the automatic lactation feeders and we’ve been able to increase feed intake by approximately 2 lbs (.91 kg) per sow per day with automatic lactation feeders.

**Feed Particle Size:** We are again checking particle size lows, going to 500-600 microns on most feed to try to get the maximum value out of the feed. I was hesitant in the past to do this, especially on sows because we previously saw so many ulcer events that lead to either dead pigs or pale/poor-doing pigs. It seems that with the Circovirus vaccine we don’t see those outbreaks anymore, so once again we have to push particle size down to maximize feed efficiency.

**Holding Pigs off Feed:** Pigs will eat 4 to 5 lbs. of feed per day. Pigs held off feed from 12 to 18 hours prior to slaughter will suffer less transportation losses and will provide a better carcass, so not only do you save that feed cost, but you have better meat quality as well. This can be a significant savings for farms.

**ON FARM MANAGEMENT**

**Fall and Spring Issues:** During harvest and planting seasons, many producers don’t do a good job of pig management. They don’t identify sick pigs quickly enough, don’t give enough shots, and don’t euthanize/remove pigs in a timely manner. Ventilation mistakes are also more common. When we’re pumping manure in deep-pitted facilities, we often have mistakes that can result in gassing and death of pigs. We go into planting and harvest seasons now with a “pre-game strategy” to make sure that these mistakes do not happen.

**Energy Costs:** Energy is a major cost in North America. We conduct energy audits on farms to find heat leaks and we check controllers to make sure they are being used cost effectively. We put extra insulation in curtain openings and unused fans in the winter, and are considering more hovers.

**Records Systems:** Detailed system records can pinpoint where death losses occur and help you do the proper diagnostics to determine how best to reduce death loss. Historical records are also important to help us find out if there are seasonal issues that can be prevented in the future.

**Labor:** Properly train farm staff so they understand prevention measures and daily management to help maximize production, which will help lower costs. Also, doing a better job of managing health and production leads to more satisfied workers. Managers and owners often underestimate how depressing poor health and bad production are to farm staff and, in turn, how these factors influence labor retention.

These are difficult times for the swine industry but we must still implement best management practices to run our farms as efficiently as possible. Those who “right-size” and “best cost” their units will be among the survivors.

Editor’s Note: Dr. Loula is with the Swine Vet Center in Saint Peter, Minnesota. (www.swinevetcenter.com) This article is based on a presentation that Dr. Loula gave at the 2010 Banff Pork Seminar.
One dose vaccine may control clinical signs of PCVAD when pig health is good but it won’t control viremia. PCV2 viremic pigs are infected and at risk particularly when challenged with other diseases and late in finishing.

**Controlling viremia is important.** Knock out viremia, and you knock out the disease. Circumvent PCV with its potent two-dose regimen controls the viremia behind the symptoms. Don’t try to make it through finishing. Protect your investment by knocking out viremia only with Circumvent PCV.

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Four economically important swine traits were considered: 1. Number of piglets born alive (NBA), 2. 21-day litter weight (W21), 3. Days to 113kg (D113), and 4. Backfat (BF10). In the present analysis, genetic improvement for backfat is assumed to be zero as the current genetic trends indicate no genetic improvement is occurring in maternal lines for this trait. This implies that the maternal lines are at or very near the desired backfat levels and no improvement in this trait is needed in the maternal lines. The genetic improvement per generation for the three remaining traits where improvement is desired in the maternal lines was assumed to be 0.3 piglets increase for NBA, 1.36 kg increased litter weight for W21, and 3 fewer days to 113kg for D113.

In this study, the sow’s age at each parity and the average sow age in a given herd parity structure was calculated in generation interval units. In turn, these values were used to determine the genetic lag for each of the four traits involved in the maternal line index (recall that backfat is being ignored) associated with each parity structure. Genetic lag of

<table>
<thead>
<tr>
<th>Parity</th>
<th>NBA</th>
<th>W21</th>
<th>D113</th>
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<tbody>
<tr>
<td>1</td>
<td>0.202</td>
<td>0.913</td>
<td>2.003</td>
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<tr>
<td>2</td>
<td>0.29</td>
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<td>3</td>
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<td>15</td>
<td>1.44</td>
<td>6.55</td>
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Table 1: Genetic Lag by Parity (for number born alive (NBA), 21 day litter weight (W21), and days to 113kg (D113) in a study evaluating the genetic lag affect on gilt replacement decisions in commercial sow breeding herds)
the commercial breeding herd associated with maintaining sows in the herd for additional parities was calculated using varying generation intervals (1.5, 2.0, 2.5, and 3.0 years) at the seedstock level.

The genetic lag was calculated for each parity and generation interval. The genetic lag associated with each parity and a 1.5-year generation interval at the seedstock level is shown in Table 1. The genetic lag was determined by multiplying the assumed genetic improvement per generation by the sow’s age in generation units at each parity. For example, in a herd with a generation interval of 1.5 years, keeping a sow until P3 would result in a genetic lag of 0.38 NBA, 1.71 kg of W21, and 3.78 D113. The genetic gain was given economic value by multiplying the assumed genetic improvement by the economic value associated with the trait of interest. The economic values given for each trait were $22 per pig born alive, $1.54 per kg of 21-day litter weight, and $0.17 per day to market. To estimate the average value of genetic lag (in dollars) per sow in the herd at each parity the genetic lag associated with each trait and then these three values were summed together.

**SOWS MUST PAY FOR THEMSELVES**

When considering the replacement costs of gilts and associated gilt development costs (feed, facilities, breeding, veterinary expense, etc.) and the higher production from sows, sows should not be culled before they reach a positive net present value or, in more lay terms, they have paid for themselves. When sows are retained for additional parities, the cost of developing gilts can be spread over larger numbers of pigs produced, thereby reducing the cost to produce a market hog. The cost of developing gilts that never enter the breeding herd has to be recovered by the remaining gilts that enter the breeding herd and produce for some number of parities. Finally, if a sow is replaced with a gilt before sufficient time has passed for the genetic supplier to make genetic progress, then the replacement gilt will have essentially the same aggregate genetic value or be from the same generation as the sow she is replacing.

The differences in production by parity must be considered when making culling decisions. Not only are there improvements of NBA and W21 with increasing parity, progeny from P2 versus P1 females have higher average daily gain

Table 2 shows the value of the difference in genetic potential between sows in the herd and a potential replacement gilt by parity and generation interval. Based on the data in Table 2, it can be recommended that sows should not be voluntarily culled when the average value of the genetic loss of the sows in the herd is not greater than or equal to the variable costs for gilt development which is sufficient to justify the purchase/development of a new gilt. Sows should be allowed to stay in the breeding herd as long as they are still producing satisfactorily based on number born alive, number weaned, weaning litter weight, etc. The optimal culling parity is when the value of the genetic improvement made in the gilt population exceeds the variable costs of developing the replacement gilt. In the present study, this occurs somewhere between parity 7 or greater, depending on the specific development costs and the genetic progress that an individual commercial pork producer experiences.

The economic value of the genetic lag associated with retaining a sow for additional parities that were presented in the results represent the upper limits with respect to the amount of genetic progress one would expect to make in a swine breeding program. Hence, the values used for the genetic gain per generation are the very highest one could expect to occur. However, when assigning values to compare making replacement decisions based on the amount of genetic gain using the extreme values is justified in order to compare differences, assuming the very best improvement occurs at the seedstock level. Table 3 shows the value of the difference in genetic potential between sows in the herd and a

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Table 2: Value of the Difference in Genetic Potential (between sows in the herd and a potential replacement gilt by parity and generation interval)

<table>
<thead>
<tr>
<th>Parity</th>
<th>Generation Interval at the Seedstock Level</th>
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<tr>
<td></td>
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1 Economic values assumed $32.00 pig born alive, $1.54 kg 21-day litter weight, $0.17 day to market. Genetic improvement per generation assumed: 0.3 pigs born alive, 1.36 kg of W21, and 3.0 D113. Backfat was not included in this evaluation because most maternal lines are at or near their desired phenotypic backfat level and hence, little or no genetic change for backfat is occurring in most maternal lines.

2 Establishing the total value of the genetic difference between a sow at a given parity with a replacement gilt at any time t is a function of the rate of improvement for the economically important traits for which the line is selected upon, the amount of time that has passed between the culling of the sow (t), and the economic value placed on those traits.
The findings support a conclusion that it is not profitable to replace sows in order to keep up with the genetic improvement that is occurring at the nucleus and multiplication levels of the genetic system used by the genetic supplier. Commercial producers must consider the fact that just because a gilt has a greater genetic potential than the current sow in the breeding herd, it does not mean that the sow should be removed from the herd. Furthermore, producers must remember they will gain the genetic improvement immediately when a replacement gilt is entered into the breeding herd to replace an “old” sow, regardless of the number of parities that sow is retained in the breeding herd. The sow must be maintained in the herd for a period of time so that producers can recover the initial investment costs and longer, such that the initial investment costs can be spread out over a greater number of pigs produced.

REFERENCES

Table 3: Average Value of the Difference in Genetic Potential (between sows in the herd and available replacement gilts by parity and differing genetic improvement rates per generation)

<table>
<thead>
<tr>
<th>Parity of forced culling</th>
<th>Genetic Improvement (NBA, W21, and D113)</th>
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1 Economic values assumed: $22.00 pig born alive; $1.14 kg-1 21-day litter weight; $0.17 day to market; 1.5 years generation interval at the seedstock level. Backfat was not included in this evaluation because most maternal lines are at or near their desired phenotypic backfat level and hence, little or no genetic change for backfat is occurring in most maternal lines.

2 Table 3: Average Value of the Difference in Genetic Potential (between sows in the herd and available replacement gilts by parity and differing genetic improvement rates per generation)

Editor’s Note: Caitlyn Abell is a graduate student at Iowa State University; Dr. Gordon Jones, PhD is in the Department of Agriculture, Western Kentucky University; and Dr. Kenneth Stalder, PhD is in the Department of Animal Science at Iowa State University.
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Long considered the pork industry leader in data management, PigCHAMP reinforces its position with new, advanced products designed to help business-minded pork producers make knowledge-based decisions. In this interview, PigCHAMP General Manager Bob Brcka provides an update on the company’s vision for the future.

Q: What changes in the industry are driving the PigCHAMP business?

BRCKA: The pork production industry is going through the same kind of business process engineering that gained popularity in manufacturing and some services businesses a few years ago. Producers big and small are thinking more than ever about internal process efficiencies and understanding what management practices can be tweaked to lower costs or improve performance. Some are even taking this to a Six-Sigma type of business engineering, where very tight process controls are put in place to eliminate “defects” that can hamper production. In order to do this you need a lot of data and you need to have it come together in a way that’s useful without a lot of time and effort. Producers don’t want multiple “systems” that can’t communicate with each other. They don’t want to put data from different sources into a spreadsheet to get information. They don’t want to outsource data to outside services to generate reports they should be able to get themselves.

These are the cues that PigCHAMP is using to improve our current products and develop new products. We continue to improve the Care 3000 reproductive program to push information out to other systems like electronic feeders and genetic evaluation models, to prevent the need for the same data to be entered multiple times. And if you want to really cut down on data entry, there’s the PigCHAMP Mobile system, where all the data you need to enter for your reproductive operation can be done in the barn on a handheld device. The information is validated and electronically synchronized with the Care 3000 program.

Care 3000 became the most widely used swine software in North America by far, based largely on the fact that you can easily get more powerful reports and analysis than has ever been available in a software program. Now we are reaching beyond that to integrate data with other systems and suppliers, whether that’s financial programs, feed suppliers or national animal traceability programs. We are doing everything we can to make it easier for producers to collect and analyze ALL the information they need to manage their operation.

Q: We often hear about the great support offered by PigCHAMP – is this one of the advantages that separates you from the competition?

BRCKA: There is no question that “support” is one of the factors that has kept PigCHAMP in the leadership position. This starts with a full-time support staff that takes calls and e-mails during office hours and responds to customer inquiries. These inquiries can range from installation and licensing, to “how-to” questions on report filtering and customization. But we define support much more broadly than a toll-free phone number and the FAQ database on our web site: It is a matter of understanding what information each producer needs to manage and improve his/her operation and doing everything we can to meet those needs. Sometimes this can result in designing a custom report or extracting information from "Customer support includes an understanding of what information each producer needs to manage and improve his/her operation and doing everything we can to meet those needs. Sometimes this can result in designing a custom report or extracting information from PigCHAMP to be used in another system. This ongoing dialog is also the primary source of the improvements we make to our programs." — Bob Brcka, General Manager, PigCHAMP
PigCHAMP created the industry standards -- Now we’ve raised them!

If you haven’t seen the latest generation of PigCHAMP products in action, you don’t know PigCHAMP.

For over 25 years, the first name that comes to mind when you think about swine record keeping and analysis is PigCHAMP. Over that time a lot has changed in swine production, but the software hasn’t… until now. PigCHAMP is pleased to introduce the first farrow-to-finish record keeping and analysis system that gives operations of all sizes the information you want -- the way you want to see it.

Care 3000 Reproductive Software
Since being introduced in 2007, Care 3000 has quickly become the most popular reproductive record keeping system in North America. Building from the success of the original PigCHAMP and incorporating input from producers and veterinarians from all over the world, Care 3000 was designed to be the standard for the next generation of swine production.

NEW! PigCHAMP Grow/Finish Software
The PigCHAMP Grow/Finish program promises to be as revolutionary of a step in record keeping and analysis as the original PigCHAMP DOS program. With the flexibility to track expenses and movements the way your operation works, PigCHAMP offers unprecedented capabilities for pig flow management, real-time group performance, and complete and accurate profit/loss information. This program can be used independently or in combination with Care 3000 as a fully integrated farrow-to-finish system.

New! PigCHAMP Mobile
Nowadays, saving time, means saving money. Designed to work with Care 3000 to save time in the barn and office, the PigCHAMP Mobile system increases the productivity and accuracy of barn workers, while eliminating duplicate data entry. The PigCHAMP Mobile system quickly pays for itself with increased productivity and getting work done right the first time.

Think you know PigCHAMP?
If you haven’t seen the latest generation of PigCHAMP products in action, you don’t know PigCHAMP. Find out what many leading producers already know and contact us for more information.

Visit us at:  www.pigchamp.com
Call toll-free:  1-866-774-4242
Email:  info@pigchamp.com
PigCHAMP to be used in another system. This ongoing dialog is also the primary source of the improvements we make to our programs. Since the Care 3000 program was launched in 2007, we have literally made dozens of enhancements that customers have asked for to improve their experience with the program.

Q: We’re hearing a lot of buzz about PigCHAMP’s new grow-finish product. How will it change the industry and when will it be available?

BRCKA: This is something we have been working on for a very long time. There is a good reason why there hasn’t been much in the way of grow-finish software available since the original PigCHAMP DOS program was introduced…it’s not easy to create software that accounts for all the different ways that hogs are produced. We think we have a product that will provide unprecedented value, and that’s what is generating the “buzz.” The feedback we are getting from the producers, veterinarians and other industry leaders we have looked to for input and feedback has been extremely encouraging. We hope that by the time this magazine is published, we will have the program in the hands of many of the people who are on the waiting list to get it installed.

Q: Web-based tools are continually being used more frequently by producers. How does this fit with the company’s overall strategy?

BRCKA: Use of the Internet has been a key to the overall strategy of PigCHAMP and our parent company, since Farms.com purchased PigCHAMP in 2001. The vision of the founders was and still is to use the Internet as a vehicle to capture, aggregate and deliver information. Over the last 10 years, Farms.com has probably been more innovative in using the Internet for the benefit of farmers than any other agribusiness. PigCHAMP is no exception. I don’t see PigCHAMP being an Internet-base software application any time in the near future... there are too many limitations with speed and processing power and we don’t want to compromise either with our customers. But many PigCHAMP users are already using the Internet to enter data and generate reports from multiple remote locations. We intend to extend these offerings in the next year by allowing for data to be entered directly into the PigCHAMP program through a web interface. We will also make web access available for user-defined benchmarking reports, statistical process control charts and some very unique analysis tools you won’t find anywhere else.

Farms.com was one of the first entities to successfully use the Internet as a tool to distribute information to the agricultural marketplace (see sidebar) and has been responsible for integrating many new web technologies in a way that is useful to producers and companies serving producers. When you integrate this knowledge and experience with the 30-plus years of accumulated knowledge that PigCHAMP has garnered in pork production data collection and analysis, you have a powerful gateway to the future.

Everything you need to stay up-to-date on the markets, agricultural news, research trends and new products can be found at the Farms.com website. The mothership for the websites listed below, Farms.com is the leading agricultural website for North American crop and livestock producers. It specializes in news, markets and current, localized weather updates, as well as expert risk and trend analyses. Insightful commentaries are updated frequently to help you re-evaluate and improve your operation. The website is designed for producers of crops (particularly corn, soybeans, wheat and canola), and livestock (with emphasis on swine, beef, dairy, and poultry). All the information you need to be a profitable producer can be found at www.farms.com. Sub-pages and related websites providing targeted content are listed below:

www.swine.farms.com: You will find current market prices, pork-related news articles, and featured commentaries covering topics ranging from animal health, management, human resources, genetics, nutrition and many other topics. Market analysis and daily market reports are found here, along with a wealth of valuable information on issues that impact your bottom line.

www.pigchamp.com: PigCHAMP has been the leader in providing knowledge software solutions to the pork industry for over 30 years. With products for desktop, server and handheld applications, PigCHAMP can provide the data collection, analysis and benchmarking tools needed for any pork production operation. See the PigCHAMP website for more information.

www.benchmark.farms.com: Go online to read the articles from previous Benchmark magazines as well as the ones featured in this magazine. Additional articles pertaining to the topics covered here are available at the site, as well as links to other helpful sources of information.

www.agcareers.com: AgCareers is the leading online career site and human resource service provider for the agriculture, food, natural resources and biotechnology industries. AgCareers connects job-seekers and employers through a targeted online employment resource. It also focuses on providing value-added training, workshops and conferences for career services and industry professionals.

www.riskmanagement.farms.com: Farms.com Risk Management is an agriculture commodity marketing and price risk management service provider. Its experienced analysts provide commodity risk management products and consulting services to producers and agri-business clients throughout North America. Customized plans help producers tailor a package of services that is right for them. The Risk Management team works the markets while their clients work the farm.

www.realestate.farms.com: For those involved in agriculture and related industries, farmland is a valuable commodity. Farms.com Real Estate is dedicated to marketing farm and rural properties across North America and around the world for its members – connecting buyers with sellers.
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Believe it or not, a light internal parasite infection can cost you anywhere from $7 to $23 per head because of higher maintenance costs, decreased feed efficiency and lower ADG. Safe-Guard® keeps parasites from worming you out of your investment by breaking the life cycle earlier.

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Economics updates 3/21-08 to account for input costs and animal value.
ENGAGE YOUR WORKFORCE
Keeping your workforce motivated is even more important during an economic slump.

By Erika Osmundson

The overall economy, H1N1, and perceptions of the swine industry have all had an impact on the view potential and current employees have about employment in the pork sector. Some would say that there is a dark cloud hanging over the industry at the moment. But, is it really as doom and gloom as some may think?

According to statistics pulled from AgCareers.com, the leading online job board for the agriculture and food industries, job postings within agriculture overall were slightly up from 2008 to 2009. Specifically, jobs in the pork sector also saw a slight increase of 4 percent in 2009.

Members of the AgCareers.com team recently sought out input on the state of employment within the swine industry from several human resource leaders at Hog Slat, Inc; PIC North America; Seaboard Foods; and The Maschhoffs. Through several investigative interviews, AgCareers.com found common threads these industry leaders shared regarding careers in pork production.

THE STATE OF EMPLOYEE MORALE
“Everyone has been affected by the economy and I would say that our employee morale is ‘typical,’” says Tony Thomas, Human Resource Manager for PIC North America. “For the most part, morale is pretty good. It is tough to see some of our customers struggle, but we have also seen some customers develop creative ways to weather this storm, and that gives our employees some resolve.”

Of all four groups that were interviewed, morale was noted as high, even for groups that had a more challenging year.

“In general, I think that our employees’ morale is good,” says Jamie Overton Thomas, Training and Recruiting Manager for Hog Slat, Inc. “While we’ve been through a difficult year, our organization used some creative strategies to retain employees, which helped keep spirits up.”

Overton Thomas mentions that while all employees from hourly to management had to make some sacrifices to help keep costs in line, the shared challenge continues to strengthen the family environment on which they pride themselves. She also notes the importance of communication to employees throughout this time.

Troy Van Hauen, Director of Human Resources at The Maschhoffs, agrees that communication is key to keeping morale high during difficult times. He attributes their positive employee morale to the company’s open door policy, transparency at all levels and getting employees involved in decision-making.

“We don’t lock ourselves in our rooms,” says Van Hauen. “A lot of trust is built for an employee when they get a chance to contribute and understand why they are doing what they are doing.”

POPULATING THE PIPELINE
Finding good people interested in a career in the pork industry can be difficult and even more challenging when the sector is perceived to be struggling. Finding ways to interact and engage with potential employees is important. Our industry panelists point out some great ways to engage young people specifically, as they are the future of this industry.

“I remind students that I speak with that we are in the food industry,” says Kay Stinson, Director of Human Resources for Seaboard Foods. “And, even though we are often driven by markets out of our control, we are still in the field of food production and people need food.”

Stinson stresses the stability of the industry and that careers in the swine industry are more diverse and professional than many think. This sentiment is echoed by Van Hauen.

“We are professional swine producers, not just pig farmers,” he states. “I talk with students about animal care, health, marketing, transportation and finance – all components of a business. As an industry we need to do a better job of sharing who we are and the ideals that we have with those outside of the pork and agribusiness industries.

“We have a genuine group of people in our industry,” adds Van Hauen. “We have something that others don’t and we need to teach others about our principles and code of conduct within the pork industry.”

PIC engages young people through an internship program that helps students learn about different aspects of the business, says Thomas. Internship programs are a great experience for the student, but also an economical resource to complete special projects and generate fresh, new ideas.

Connecting with this young talent can pose a challenge. Thomas mentions that beyond trying to connect directly with the student, he works with faculty and student advisors to help spread the word on campuses. However, building and maintaining a consistent on-campus presence can be difficult due to the peaks and valleys of the swine industry.

“As an industry we come and go with our on-campus presence – there is no middle ground,” says Thomas. “We need to do a better job of maintaining a presence to build a more effective brand as an industry and as individual organizations.”
“We have a genuine group of people in our industry. We have something that others don’t and we need to teach others about our principles and code of conduct within the pork industry.”

· Troy Van Hauen, Director of Human Resources, The Maschhoffs

RETAINING TALENT
As the economy rebounds, the potential for new employment opportunities will increase. While a little turnover within a business is often good, too much can create problems for an organization. The panel members agreed there is some concern about this movement, but all believe the problem can be alleviated with effective retention programs.

Seaboard Food’s employer brand campaign is ‘The Company that Works for You.’ Stinson says they focus on programs and activities that employees are going to get the most value out of, for example, their ‘Back to School Barbeque.’ Not only does the company invite its employees’ families, but also the local school faculty members.

“This type of approach says to employees that we (Seaboard Foods) are supportive and encouraging of you and the commitment you have to your children’s education,” states Stinson.

Stinson adds that another retention tactic on which they are focused is the training and education of their employees, particularly as it pertains to succession planning. The company looks at the talent needed and what current employees are doing within their jobs.

“We want people to know that there is a vested interest in them and the potential opportunities that are available for them,” she says.

This ideal is shared by Van Hauen, who says The Maschhoffs organization has developed specific Leadership Development Programs for employees to help them grow their career. He believes it’s important to focus on programs that aren’t just about money, especially when times are tough.

Some programs require an investment but the rewards generally overcome the expense. Wellness programs may be one of those; they are popular and have been shown to improve retention in many studies. Hog Slat, Inc. recently developed and promotes a comprehensive wellness plan for employees.

“The wellness plan works as part of our health insurance plan to encourage employees to take a proactive role in improving their own health by offering incentives and premium reductions based on participation,” says Overton Thomas. “Often times, employees don’t look at the real cost of their health insurance benefits.”

Overton Thomas says that during promotional events for the program, they bring the real costs of healthcare to the table. The Hog Slat plan gives employees the power to control their own healthcare costs which they appreciate. In addition, it shows employees what they can do to help reduce healthcare expenses to the company and gives them some responsibility to the company’s bottom line.

PORTRAYING A POSITIVE IMAGE
Industry leaders within the pork industry have the passion to lead our organizations and are inherently optimistic, says Thomas. But he warns that when we talk with employees or potential candidates, we need to speak the truth.

“From a realist’s standpoint, we don’t want to sell blue sky,” says Thomas. “Employees respect honesty and we need to try to be realistic with them.”

Stinson suggests that when communicating with the public about employment within the swine industry, we think about what is important.

“We really want to show there is a game plan for the organization, management and themselves,” says Stinson. “Employees want to know how the work they do fits within the mission of sustainability of the organization.”

This type of direction gives employees the passion they need to stay engaged with the organization. Also, Stinson said that there is always the ability to foster intellectual and creative growth among employees, thereby creating more profitability later.

FINAL THOUGHTS
While the past year was challenging, the global demand for food has never been higher nor has the capability to produce safe, high-quality food for a global market ever been more advanced. These two factors bode well for the swine industry.

Overton Thomas believes we need to remind the public that the pork industry, unlike many industries, is not a fad. Humans will always incorporate healthy and safe protein into a balanced diet.

“The world’s population grows by approximately 200,000 people per day,” says Overton Thomas. “That’s 200,000 people who cannot possibly produce enough food for themselves and need others to do it for them. This type of job security, along with the social importance associated with being a provider of food should be shared with the public on a regular basis so our industry can continue to recruit the best and brightest.”

With the steadfast determination of the people within the industry, and a focus on engaging our workforce, the industry will once again thrive.

“It was enlightening to talk with these industry leaders, as they spread a refreshing light,” says Eric Spell, President of AgCareers.com. “Right now, it is imperative that we communicate the positives about the swine industry and continue to advocate not only for our own organizations but the industry as a whole. Working together is our best chance to continue to move the swine industry on to bigger and better things.”
The ethanol industry has experienced rapid growth following the implementation of the Energy Policy Act of 2005. The act states that U.S. domestic production of renewable fuels should reach 7.5 billion gallons in annual production by 2012. In Canada, different provincial standards have been created to ensure that all gasoline contain at least 5 to 10% ethanol. These two national policies have fostered a period of rapid and widespread expansion of ethanol distilleries that has caused an increase in demand for corn, as it is the primary feedstock in North American ethanol production. The increased demand for corn has caused prices to move higher and as such, prices for commodities that compete for acreage with corn has also increased. Hog producers are facing higher feeding costs because of higher prices for corn (an energy source) and soybean meal (a protein source) due to ethanol.

Dried Distillers Grains with Solubles (DDGS) can be an attractive feedstuff for pork producers. By Stewart Skinner

Dried Distillers Grains with Solubles (DDGS) are a by-product of ethanol and traditionally were not widely used by hog producers due to issues with product quality and nutritional variability. Improved manufacturing processes and technology have made DDGS a more attractive ingredient for swine producers and use of DDGS in hog feeds is becoming common across North America.

In a recent study, DDGS reduced the cost of feed by 12.8% when a three phase grow-finish diet was fed with a DDGS inclusion rate of 25%. DDGS acted as a substitute for multiple nutrients, most notably energy, crude protein (amino acids) and phosphorus. The majority of savings from DDGS were incurred through the partial replacement of corn, soybean meal, and di-calcium phosphate. The reduction in feed costs when DDGS is present is consistent with an Iowa State study conducted by Jacinto Fabiosa in 2008 and with recent trends noted by commercial feed sellers. Decreased feed cost leads to the conclusion that DDGS should be incorporated in swine feeds.

The rations including DDGS had higher levels of crude protein, total phosphorus and available phosphorus than the DDGS-free rations. The nutrient retention efficiency for nitrogen was reduced to 31.4% (from 36.3%) while phosphorus retention was reduced to 28.4% from 29.6%. Higher nutrient levels in the feed, together with lower nutrient retention ratios when DDGS are fed led to increased levels of nitrogen and phosphorus in the manure. When DDGS was included in the diets, excretion of nitrogen increased by 20.3% while phosphorus excretion increased by 6.5%.

While increased emissions of nitrogen and phosphorus from DDGs can be seen as negative, the overall impact of these increases depends on the nutrient management situation of the individual farm. Higher emissions of nitrogen and phosphorus may be overcome in certain environments; cropping strategies can be altered to increase the ability of crops to remove excess nutrients. The cost of these increased emissions is dependent on the regulatory situation of a given region. Hog farms in regions with strict environmental legislation will face higher costs due to increased emissions than farms in an area with little or no environmental regulation. Regardless of presiding regulations, fertilizer applications can also be adjusted to account for higher nutrient content in the manure. Increased nitrogen levels will allow for a decrease in purchased supplemental nitrogen, lowering costs for farmers who utilize swine manure as fertilizer.

The expansion of the ethanol industry has increased feed costs, however improved product quality has allowed greater use of DDGS in swine diets. This research supports previous findings that DDGS can lower feed costs, however the incorporation of DDGS changes the nutrient content of manure. Regional regulatory structure will determine the cost or benefit of increased emissions.

Editor’s Note: Stewart Skinner, a M. Sc student at the University of Guelph has spent the last year researching how the adoption of DDGS can influence ration choice and the impacts that DDGS use may have on the excretions of nitrogen and phosphorus under the supervision of Dr. Alfons Weersink and Dr. Kees DeLange. The information provided in this article is from his study.
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