The Strategic Environment

Summary of the 2010 Data

Impact of Managing Gilt Service Interval on Gilt Performance

Hog Futures Are in Hog Heaven!

Grow/Finish Data: An Untapped Resource

Future of Swine Record-Keeping Is Here. Now.

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BENCHMARK RESOURCES ONLINE
These articles, along with articles from past Benchmark magazines and additional information from the experts can be found at the Benchmark website: www.benchmark.farms.com. We invite you to visit the site and add your comments on the Benchmark blog. If you have any additional information and/or relevant articles, tell us about them and we will post them at the site. You can also access the Benchmark site from the swine page at: www.swine.farms.com.
Welcome to Benchmark

PigCHAMP and the rest of the Farms.com family are pleased to bring you the 2011 edition of *Benchmark – Preparing for the Future.*

The past few years have been challenging for everyone involved in the pork industry and we all know the future is going to be mixed with great opportunities and difficult times. To be successful, every organization must continue to develop systems, processes and their teams to improve global competitiveness and productivity.

This issue of *Benchmark* and the accompanying website, www.benchmark.farms.com are devoted to providing production information, management tips and ideas on how you can prepare your pork operation for the challenges of the future. Following are some of the highlights in this issue:

- Our PigCHAMP team provides the annual benchmark analyses of the production data from the hundreds of farms that participate in the program
- Dr. Dennis DiPietre shares strategic insight into the value of implementing systems and processes to improve competitiveness in this global pork industry
- Eric Spell from AgCareers.com discusses why it is important to remain competitive with your employees so you can retain and reward top performers
- The commodity markets have a significant impact on the profitability of pork operations – Moe Agostino from Farms.com Risk Management looks at the pork and grain markets to provide an outlook for the next 12 months

A special thank you goes to all of our contributors and advisors. Thanks also to Susan Olson, Knowledge Center Manager at PigCHAMP. And of course, without the support of our sponsors, this publication would not be possible.

We hope you find this year’s magazine helpful and we encourage you to take advantage of the additional information on our website.

We look forward to working with you in the future,

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

Bob Brcka
General Manager
PigCHAMP, Inc.
www.pigchamp.com

The PigCHAMP Benchmarking program is open to pork producers who share their production information. Participants receive free quarterly updates of how their operations compare to the Benchmark averages. PigCHAMP also offers in-depth customized reports for a small fee. PigCHAMP is a proud member of the Farms.com Family of Companies. We strive to provide innovative information products and services to the global agriculture and food industries.
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1 Piontkowski, M., Eichmeyer, M. Multi-site field study confirms safety of trivalent vaccine mixture. Accepted Leman Swine Conference 2010.
3 Hewick, G. et al. Trivalent vaccine mixture protects against simultaneous challenge with M. hyopneumoniae, PCV2 and PRRS virus. Accepted Leman Swine Conference 2010.
THE STRATEGIC ENVIRONMENT
Increasing demands, shifting sands create an entirely different landscape for pork production.

By Dennis DiPietre

The Food and Agricultural Organization (FAO) of the United Nations recently issued a report announcing that the world is confronting the staggering challenge of increasing food production 50 percent by the year 2030 and doubling total food production by the year 2050. If this Herculean challenge is not enough, it will take place in an environment where many of the old standards, rules of thumb and other landmarks of familiarity used by producers to understand their businesses are fading away rapidly.

Everywhere we look, the landscape seems strangely different. The trusted guideposts that provided comfort we were on the right path just a few years ago are missing or in different places, and the near-term outlook seems murky. The probability is high that as globalization of agriculture becomes more mature, national and global policy makers will intervene to preserve scarce resources, protect regional and national food security and manage the global environment. The timing and extent of the interventions and how they will be manifest is less sure. Expect increases in prohibitions, increased taxes on energy, water and other input uses, enhanced permitting requirements, increased fees and time delays, disqualification of certain production technologies and removal of tools like antibiotics from the tool kit. These actions threaten to materially affect the stability of the mean value of many of the production metrics we have classically associated with benchmarking.

DEFINITIONS LOSING THEIR MEANING
For instance, there is no longer any such thing as a high hog price. The same price can produce windfall profits one quarter or staggering losses the next, depending on the price of corn and/or bean meal. The same can be said of key feed ingredient costs. Is $3/bu. corn high priced (like it seemed in 2006) or is $5 corn high (like it seemed in 2008) or is $7 corn high (like it seems in 2011)? What is the meaning of a low-cost producer when key input costs are making historic moves to new equilibrium levels and cycling wildly along the way?

For over ten years, largely the decade of the 1990’s, a $0.38 live cost of production was considered a golden benchmark of cost containment and efficiency. Today, what is acceptable, competitive, high, low or normal is blurred daily by the relentless price volatility of feed ingredient markets, where failure to achieve continual record harvests from now forward almost ensures price rationing and huge potential losses for users.

EFFICIENCY REDEFINED
While the capacity to double global food production makes us think immediately of needed inputs and the efficiency required to wring that much production out of a fixed space, the foundational meaning of the word efficiency is under revision as policy makers try to re-shape the term to incorporate the global impact of an individual’s resource use. Strong and continued growth in the emerging nations (China, India, Brazil, Indonesia and Russia, for instance) is beginning to accelerate a longstanding shift of rural populations to nearby urban areas and raising per capita income. It is not at all unlikely that meat demand in emerging nations will double (China notwithstanding) or more as per capita incomes skyrocket compared to old world rural farming standards of living.

This article will address coming changes, the challenge of benchmarking in a period of relentless price and cost volatility, and a prescription for increasing the value of benchmarking as the industry navigates one of its most risky and potentially rewarding periods ever.

WHY BENCHMARKING?
Benchmarking provides a means for firms to put the “dip stick” in and take a reading across a variety of production, financial and engineering efficiency measures to ascertain if a farm is measuring up to current competitive standards or if it is in need of a tune-up. In addition, the regular practice of benchmarking provides a key awareness mechanism that performs a couple of very important functions.

First, benchmarking provides a means to scan the strategic or external environment for changes embodied in the shifting values of leading firms’ performance metrics. This ensures a farm does not become insular and cut-off from progress being made throughout the wider progressive slice of the industry. Second, benchmarking forces the time necessary to systematically assess and measure the current performance of the farm, ensuring own-farm awareness and beliefs are accurate. Herd owners are subject to a kind of delusion about their own performance that will continually overestimate performance unless the hard, cold facts are periodically measured and addressed.

WILL CLASSIC BENCHMARKING REMAIN RELEVANT?
Classic benchmarking involves comparing the processes, practices, efficiency measures and other performance metrics of your firm to those of a target group—often peers, competitors or industry leaders. It’s a practice carried out with the purpose of staying competitive or regaining competitiveness, lowering cost or improving production processes. The typical practice of periodically comparing a wide range of efficiency and cost
metrics has been very helpful to many firms when properly understood and carried out. Benchmarking strategy (versus numerical values), while a little less common for the average producer, is also a valuable and insightful undertaking and many producers practice it both as a formal process and informally over coffee with fellow producers. Internal benchmarking as a means to track self-improvement (without referencing an outside standard) also can be beneficial, especially when differences like idiosyncratic farm structures, products, relationships and marketing arrangements make comparison with outsiders too problematic.

In practice, typical benchmarking runs the full gamut between the informal and curious to the nit-pickingly professional. Most producers at least informally benchmark the perceived key competitiveness benchmarks by reading industry magazines, talking with their consultants or in casual conversations with other producers. Keeping an eye on the industry shifts in feed conversion ratio (FCR), average daily gain (ADG), pigs weaned per sow per year (PWS), labor cost/head is an important way many producers strive to make sure they are not slipping compared to peers or larger-scale firms. Others engage professional help through their veterinary consultants, record systems or bureaus, bankers or accountants and sometimes through audited benchmarking firms. Benchmarking firms strive to make sure all data utilized is accurate, comparable and that the formulas used to calculate the various metrics are standardized. Audited benchmarking firms frequently provide a skilled consultant to both analyze the comparative reports and information and to present it to the management team and answer questions.

However, massive change in local and global production environments and the volatility this change is bringing means that without some serious evolution, classic benchmarking will gradually become at best, less relevant to competitiveness and at worst, a guiding light to failure and demise.

YOU ARE BEING BENCHMARKED!

At the level of the firm, prices or costs of inputs serve a very important allocation function. As prices of key inputs rise (such as corn), the broader market is sending a message: “Use this input for higher value purposes or seek substitutes!” Without the need of a “Corn Czar,” prices ration the product toward high-value uses. Benchmarking is a means to track the efficiency with which you use valuable resources, as their price influences some key benchmarks, especially those related to feed costs.

What you may not know is that your industry is being subjected to a form of societal and global benchmarking that will become increasingly important to you as the resulting policy prescriptions are realized in new laws and regulations, input-use taxes, targeted subsidies, purchase mandates and technology use restrictions. For instance, did you know that while you are measuring the amount of feed it takes to produce a pound of carcass, dozens of researchers at universities, non-governmental organizations (NGOs) and quasi-government institutes are estimating the amount of energy (in calories) it takes whole-chain, to produce a pound of pork carcass, as well as beef and other food products?

They are finding that food production is notoriously energy inefficient. The full-chain production process to create a pound of pork carcass is very energy intensive. Right now, published studies show that the usable calories gained from the consumption of a given quantity of meat is far eclipsed by the calories of energy needed to produce it (including all of its inputs), process it, transport it, refrigerate it, cook it and eat it. Not all foods are equally energy inefficient and food products as well as diets are being given scores based on energy benchmarking. As you might guess, vegetables and fish are less energy-consuming per net calorie gained from consumption than is pork, beef or chicken.

Since you stick to firm-level costs in your benchmarking, you have not been concerned with societal costs. But as we push usage rates up on limited global resources, prices plus add-on taxes will allocate scarce energy, water and grain resources to those production processes and products deemed by policy-makers as most valuable to society.

For instance, with the political goal of reducing U.S. dependence on foreign sources of energy, U.S. policy through ethanol subsidies, mandated purchasing and tariffs to block foreign (and cheaper) competitive products for competing is driving massive price volatility into the U.S. corn market. The resulting $7 corn price means that unless you are producing something that society believes is very valuable with that corn, it is time to look for substitutes and to strictly adopt waste-prevention strategies.

Classic benchmarking can help reduce waste, but switching to alternative diet ingredients, formulations and by-products also shifts the biologic and engineering metrics that are not directly input-price-sensitive, such as ADG and FCR. A profit-superior FCR may look inferior numerically to a competitor using, for instance, a corn/soy diet. However, if the substitute ingredients are less expensive per unit measure, more can be used to achieve the same level of growth. This underlines a key principle: benchmarking processes with resulting numerical outcomes are critical to correct decision-making, versus only comparing numbers on gross measures of performance.

Benchmarking provides a means for firms to put the “dip stick” in and take a reading across a variety of production, financial and engineering efficiency measures to ascertain if a farm is measuring up to current competitive standards or if it is in need of a tune-up.

continued on page 22
Benchmarking provides an opportunity for the retrospective review of industry performance. The present year-end summaries reveal interesting numbers in comparison to what we saw five years ago. 2010 was another year of improved overall performance for U.S. herds, despite wide variations among individual farms. The U.S. herds showed

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### USA 2010 - 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>337.21</td>
<td>324.430</td>
<td>229.00</td>
<td>725.00</td>
<td>76.00</td>
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<td>% Repeat services</td>
<td>Percent repeat services</td>
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<td>4.619</td>
<td>9.00</td>
<td>15.80</td>
<td>4.70</td>
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<td>Total services</td>
<td>Total number of services</td>
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<td>4117.080</td>
<td>2035.00</td>
<td>10715.00</td>
<td>985.00</td>
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<td>Farrowings</td>
<td>Number of sows farrowed</td>
<td>3493.35</td>
<td>3708.090</td>
<td>1654.00</td>
<td>9595.00</td>
<td>752.00</td>
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<td>Farrowing rate</td>
<td>Farrowing rate</td>
<td>81.46</td>
<td>6.726</td>
<td>82.49</td>
<td>89.39</td>
<td>72.65</td>
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<td>Total born</td>
<td>Total pigs born</td>
<td>45889.48</td>
<td>49375.450</td>
<td>20349.00</td>
<td>118606.00</td>
<td>9194.00</td>
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<td>Total born/litter</td>
<td>Average total pigs per litter</td>
<td>12.82</td>
<td>0.957</td>
<td>12.82</td>
<td>14.13</td>
<td>11.62</td>
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<tr>
<td>Total liveborn</td>
<td>Total pigs born alive</td>
<td>40653.41</td>
<td>43699.440</td>
<td>18416.00</td>
<td>107865.00</td>
<td>8523.00</td>
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<td>Liveborn/litter</td>
<td>Average pigs born alive/litter</td>
<td>11.47</td>
<td>0.677</td>
<td>11.51</td>
<td>12.27</td>
<td>10.60</td>
</tr>
<tr>
<td>Liveborn/female/year</td>
<td>Litters/fem/yr * ave pigs born alive per litter</td>
<td>25.39</td>
<td>2.364</td>
<td>25.69</td>
<td>28.60</td>
<td>21.78</td>
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<tr>
<td>Total stillborn</td>
<td>Total stillborn pigs</td>
<td>3198.24</td>
<td>3577.570</td>
<td>1482.00</td>
<td>8614.00</td>
<td>535.00</td>
</tr>
<tr>
<td>Stillborn/litter</td>
<td>Average stillborn pigs</td>
<td>0.89</td>
<td>0.321</td>
<td>0.87</td>
<td>1.31</td>
<td>0.48</td>
</tr>
<tr>
<td>Total mummified</td>
<td>Total mummified pigs born</td>
<td>1027.03</td>
<td>1612.140</td>
<td>401.00</td>
<td>2793.00</td>
<td>30.00</td>
</tr>
<tr>
<td>Mummified per litter</td>
<td>Average mummies per litter</td>
<td>0.24</td>
<td>0.190</td>
<td>0.21</td>
<td>0.47</td>
<td>0.04</td>
</tr>
<tr>
<td>Sows weaned</td>
<td>Sows farrowed and weaned</td>
<td>3488.26</td>
<td>3707.880</td>
<td>1642.00</td>
<td>9657.00</td>
<td>748.00</td>
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<tr>
<td>Piglets weaned</td>
<td>Total pigs weaned</td>
<td>34975.88</td>
<td>37455.180</td>
<td>16034.00</td>
<td>94212.00</td>
<td>7143.00</td>
</tr>
<tr>
<td>Piglets weaned/litter</td>
<td>Pigs weaned per litter weaned</td>
<td>10.16</td>
<td>0.553</td>
<td>10.18</td>
<td>10.81</td>
<td>9.43</td>
</tr>
<tr>
<td>% Total losses of liveborn</td>
<td>Pre-weaning mortality</td>
<td>12.62</td>
<td>3.419</td>
<td>12.63</td>
<td>17.16</td>
<td>8.54</td>
</tr>
<tr>
<td>Average weaned weight</td>
<td>Average litter weaning weight (N=102)</td>
<td>133.50</td>
<td>27.425</td>
<td>134.00</td>
<td>153.79</td>
<td>111.26</td>
</tr>
<tr>
<td>Piglets age at weaning</td>
<td>Average age at weaning</td>
<td>20.13</td>
<td>1.758</td>
<td>19.87</td>
<td>22.00</td>
<td>18.35</td>
</tr>
<tr>
<td>Piglets weaned/sow/year</td>
<td>Pigs weaned/mated female/yr</td>
<td>23.09</td>
<td>2.487</td>
<td>23.30</td>
<td>26.01</td>
<td>20.10</td>
</tr>
<tr>
<td>Piglets weaned/female/year</td>
<td>Pigs weaned/female/year</td>
<td>21.90</td>
<td>2.670</td>
<td>22.19</td>
<td>25.11</td>
<td>18.63</td>
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<tr>
<td>Total boars</td>
<td>Ending boar inventory</td>
<td>9.06</td>
<td>42.141</td>
<td>3.00</td>
<td>15.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Sows added</td>
<td>Females entered</td>
<td>9.85</td>
<td>90.791</td>
<td>0.00</td>
<td>1.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Sows culled or sold</td>
<td>Sows and gilts culled</td>
<td>764.56</td>
<td>871.352</td>
<td>371.00</td>
<td>1880.00</td>
<td>161.00</td>
</tr>
<tr>
<td>% Cull per year</td>
<td>Culling rate (N=325)</td>
<td>48.24</td>
<td>12.630</td>
<td>47.62</td>
<td>62.69</td>
<td>33.67</td>
</tr>
<tr>
<td>Sows died</td>
<td>Sow and gilt deaths</td>
<td>122.86</td>
<td>135.880</td>
<td>65.00</td>
<td>337.00</td>
<td>21.00</td>
</tr>
<tr>
<td>% sow deaths per year</td>
<td>Death rate</td>
<td>7.91</td>
<td>3.322</td>
<td>7.55</td>
<td>11.93</td>
<td>3.99</td>
</tr>
<tr>
<td>Total sows</td>
<td>Ave female inv - Ave gilt pool inv</td>
<td>1469.83</td>
<td>1504.590</td>
<td>710.00</td>
<td>3898.00</td>
<td>358.00</td>
</tr>
</tbody>
</table>

Total farms used for summary = 329
significant improvements in performance in terms of key variables of average pigs born alive per litter (11.47 versus 10.64 perviously) and pigs weaned per mated female per year (23.09 versus 21.78 previously).

Sow culling rates and death rates continued to decline in U.S. herds during this time. Preweaning piglet deaths did increase somewhat (from 12.18 to 12.62).

Canadian herds sustained their level of performance during this time and showed a reduction in culling rates (from 44.45 percent down to 40.39 percent) and death rate (from 8.10 percent to 7.68 percent).

However, it was interesting to note the continued existence of the wide range in performance of individual farms in terms of these key production indicators in both countries. This variation is clearly an indication of the potential for improvement on many farms.

The PigCHAMP Benchmarking program is open to pork producers who share their production information. Participants receive free quarterly updates of how their operations compare to the Benchmark averages. PigCHAMP also offers in-depth customized reports for a small fee.

### Canada 2010 - 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>176.67</td>
<td>188.453</td>
<td>102.00</td>
<td>471.00</td>
<td>34.00</td>
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<td>% Repeat services</td>
<td>Percent repeat services</td>
<td>8.31</td>
<td>3.640</td>
<td>7.30</td>
<td>14.20</td>
<td>3.90</td>
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<tr>
<td>Total services</td>
<td>Total number of services</td>
<td>2131.69</td>
<td>2034.190</td>
<td>1506.00</td>
<td>6055.00</td>
<td>527.00</td>
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<td>Farrowings</td>
<td>Number of sows farrowed</td>
<td>1820.96</td>
<td>1751.910</td>
<td>1118.00</td>
<td>5082.00</td>
<td>448.00</td>
</tr>
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<td>Farrowing rate</td>
<td>Farrowing rate</td>
<td>84.06</td>
<td>4.987</td>
<td>85.79</td>
<td>89.06</td>
<td>76.40</td>
</tr>
<tr>
<td>Total born</td>
<td>Total pigs born</td>
<td>24088.67</td>
<td>23747.440</td>
<td>14580.00</td>
<td>70860.00</td>
<td>5929.00</td>
</tr>
<tr>
<td>Total born per litter</td>
<td>Average total pigs per litter</td>
<td>13.07</td>
<td>0.790</td>
<td>13.11</td>
<td>14.10</td>
<td>11.80</td>
</tr>
<tr>
<td>Total liveborn</td>
<td>Total pigs born alive</td>
<td>21282.47</td>
<td>20901.690</td>
<td>13463.00</td>
<td>61588.00</td>
<td>5108.00</td>
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<tr>
<td>Liveborn per litter</td>
<td>Average pigs born alive/litter</td>
<td>11.62</td>
<td>0.660</td>
<td>11.60</td>
<td>12.50</td>
<td>10.65</td>
</tr>
<tr>
<td>Liveborn/female/year</td>
<td>Litters/Fem/yr * ave pigs born alive per litter</td>
<td>26.89</td>
<td>2.645</td>
<td>27.45</td>
<td>29.86</td>
<td>23.10</td>
</tr>
<tr>
<td>Total stillborn</td>
<td>Total stillborn pigs</td>
<td>1730.96</td>
<td>1760.560</td>
<td>1144.00</td>
<td>3443.00</td>
<td>342.00</td>
</tr>
<tr>
<td>Stillborn per litter</td>
<td>Average stillborn pigs</td>
<td>0.94</td>
<td>0.305</td>
<td>0.97</td>
<td>1.23</td>
<td>0.54</td>
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<tr>
<td>Total mummified</td>
<td>Total mummified pigs born</td>
<td>555.06</td>
<td>612.509</td>
<td>298.00</td>
<td>1564.00</td>
<td>42.00</td>
</tr>
<tr>
<td>Mummified per litter</td>
<td>Average mummies per litter</td>
<td>0.28</td>
<td>0.151</td>
<td>0.27</td>
<td>0.45</td>
<td>0.10</td>
</tr>
<tr>
<td>Sows weaned</td>
<td>Sows farrowed and weaned</td>
<td>1813.94</td>
<td>1748.520</td>
<td>1115.00</td>
<td>5067.00</td>
<td>448.00</td>
</tr>
<tr>
<td>Piglets weaned</td>
<td>Total pigs weaned</td>
<td>18794.63</td>
<td>18443.370</td>
<td>11672.00</td>
<td>51998.00</td>
<td>4759.00</td>
</tr>
<tr>
<td>Piglets weaned per litter</td>
<td>Pigs weaned per litter weaned</td>
<td>10.28</td>
<td>0.718</td>
<td>10.50</td>
<td>11.37</td>
<td>9.47</td>
</tr>
<tr>
<td>% Total losses of liveborn</td>
<td>Pre-weaning mortality</td>
<td>11.61</td>
<td>2.516</td>
<td>11.94</td>
<td>15.28</td>
<td>8.00</td>
</tr>
<tr>
<td>Average weaned weight</td>
<td>Average litter weaning weight (N=30)</td>
<td>96.68</td>
<td>46.569</td>
<td>76.75</td>
<td>149.50</td>
<td>51.52</td>
</tr>
<tr>
<td>Piglets age at weaning</td>
<td>Average age at weaning</td>
<td>20.77</td>
<td>2.007</td>
<td>20.60</td>
<td>24.53</td>
<td>18.50</td>
</tr>
<tr>
<td>Piglets weaned/sow/year</td>
<td>Pigs wnd/mated female/yr</td>
<td>24.41</td>
<td>2.094</td>
<td>24.57</td>
<td>26.90</td>
<td>21.49</td>
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<tr>
<td>Piglets weaned/female/year</td>
<td>Pigs wnd/female/year</td>
<td>23.59</td>
<td>2.418</td>
<td>24.00</td>
<td>26.10</td>
<td>20.54</td>
</tr>
<tr>
<td>Total boars</td>
<td>Ending boar inventory</td>
<td>21.35</td>
<td>40.257</td>
<td>3.00</td>
<td>82.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Sows added</td>
<td>Females entered</td>
<td>35.71</td>
<td>55.783</td>
<td>0.00</td>
<td>105.00</td>
<td>0.00</td>
</tr>
<tr>
<td>Sows culled or sold</td>
<td>Sows and gilts culled</td>
<td>321.49</td>
<td>304.548</td>
<td>218.00</td>
<td>925.00</td>
<td>62.00</td>
</tr>
<tr>
<td>% Cull per year</td>
<td>Culling rate</td>
<td>40.39</td>
<td>14.187</td>
<td>39.38</td>
<td>58.23</td>
<td>22.70</td>
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<tr>
<td>Sows died</td>
<td>Sow and gilt deaths</td>
<td>61.47</td>
<td>64.641</td>
<td>40.00</td>
<td>162.00</td>
<td>12.00</td>
</tr>
<tr>
<td>% sow deaths per year</td>
<td>Death rate</td>
<td>7.68</td>
<td>2.483</td>
<td>7.50</td>
<td>11.39</td>
<td>4.50</td>
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<tr>
<td>Total sows</td>
<td>Ave female inv - Ave gilt pool inv</td>
<td>763.52</td>
<td>728.128</td>
<td>471.00</td>
<td>2190.00</td>
<td>188.50</td>
</tr>
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</table>

Total farms used for summary = 49
PRACTICAL ON-FARM USE OF BENCHMARKING

Benchmarking helps us compare and improve important production parameters.

By Dave Wade

As defined in Wikipedia, benchmarking “is the process of comparing one’s business processes and performance metrics to industry bests and/or best practices from other industries.” At The HANOR Family of Companies, we use the PigCHAMP benchmarking reports to compare ourselves with some of the best producers in the industry. Although I believe most of our time should be spent becoming better than we were yesterday, it’s also imperative that we spend some time understanding and taking note regarding the performance of our competitors.

The beauty of the PigCHAMP benchmarking report is that participants all use the same sow-recording system. This provides the basis for consistent interpretation of the information; we don’t have to question the math behind the numbers because the results are calculated by the same method. When we hear reports or see performance data from other operations that aren’t using PigCHAMP we spend too much time trying to understand the math behind the result. More often than not, it can lead to doubt regarding the performance of other operations, if they aren’t using the same recording system.

After each quarterly benchmarking report is received, we compare the performance of each of our sow farms and record whether or not they’re in the top 50 percent in each of eight categories we believe are most critical.

The categories we use for comparison are Pigs/Mated Female/Year, Repeat Services Percent, Farrowing Rate, Farrowing Index, Born Alive/Litter, Stillbirths Percent, Pre-Weaning Mortality and Lactation Length. For instance, if the mean Farrowing Rate is 83 percent on the benchmark report and the farm we are looking at has an actual farrowing rate of 84 percent, it would rank in the top 50 percent. However, if the farm isn’t ahead of the mean, the farm receives an “x” in the category.

Our goal is to have all of our farms in the top 50 percentile of Pigs/Mated Female/Year. The other rankings for Repeat Services, Farrowing Rate, Farrowing Index, Born Alive/Litter, Stillbirths, Pre-Weaning Mortality and Lactation Length are simply used to identify trends of what might be preventing us from reaching the top 50 percent of Pigs/Mated Female/Year.

For example, if most of the farms that are below the top 50 percent in Pigs/Mated Female/Year also have an “x” in the column labeled Pre-Weaning Mortality, indicating that they are below the top 50 percent of the category Pre-Weaning Mortality, then we have probably identified an area we can work on to move our farms into the top 50 percentile of Pigs/Mated Female/Year. I also take note that if we have over half of our farms with an “x” in a category, it’s an area we should work on to improve in all our farms across the company.

The use of PigCHAMP Benchmarking reports allows us to improve our operations by intensively comparing and improving categories we believe are critical in attaining our goal of having all of our sow farms in the top 50 percent of Pigs/Mated Female/Year.

Editor’s Note: Dave Wade is vice-president of operations for The HANOR Company of Wisconsin, LLC. Family of Companies.
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IMPACT OF MANAGING GILT SERVICE INTERVAL ON GILT PERFORMANCE

Helpful reports can be used for herd improvement.

By Sasha Gibson and Jayne Jackson

This study investigated relationships between gilts that had at least one recorded estrus prior to breeding compared to gilts that had none. The subsequent performance over their lifetime was compared with gilts that did not have a recorded heat. This population study was conducted using 258 farms (330,000 sows) that are located in North America. The data was sourced from PigCHAMP® Knowledge Center Database from 2007 to 2009.

This article provides insight into recording and heat-checking gilts. Data was analyzed from the PigCHAMP® Farrow to Finish Program using four reports:

• First Litter Performance
• Reproductive Loss Report
• Subsequent Litter Performance
• Age at First Service Analysis

GILT DEVELOPMENT

Most farms have a dedicated gilt development plan. This includes a separate set of buildings to raise the animals, more square footage than commercial animals, breeding gilts older than 220 days, 300 lbs. in weight and specialized diets. Industry recommendations for gilt management include breeding gilts on the second or third estrus.

The data analyzed shows that the percentage of gilts with recorded Heat No Service (HNS) events increased from 2007 to 2009 by 4 percent. This population study includes 190,000 gilt breeding events, and 18 percent of the total gilts bred had at least one Heat No Service (HNS) event recorded.

GRAPHs

The entry age of the gilts with an HNS event recorded was 218 days, with an entry-to-service interval of 47 days (Figure 1). Gilts were bred at an average of 264 days of age (2007 to 2009).

The entry age of the gilts without a heat recorded was 223 days, with an entry-to-service interval of 33 days (Figure 2). Gilts were bred at an average of 252 days of age (2007 to 2009).

The gilts that had an HNS event were not bred within 20 days of arrival into PigCHAMP. The act of entry is usually associated with a tagging or tattooing event for the gilts. On the No Heat Recorded group, 36 percent were bred within 20 days (Figures 3 & 4).

Total born was .9 of a piglet higher on the gilts that had an observed heat recorded. There were 0.7 more live born piglets per litter for HNS parity-one farrowings than no heat recorded gilts (Figure 5).

Reproductive loss was compared for all parities bred in the first six months of 2009. The sows that had a Heat No Service event when they were gilts were compared to No Heat (Table 1: Performance Averages on All Parities).

Subsequent litter performance was used to analyze how total born in the first litter affects future performance. Gilts that farrowed in 2008 were followed through the end of 2009. The HNS gilts have more total born and live born on the first farrowing, and this remains higher throughout their lifetime performance (Figures 6 & 7). This live born, cumulative through parity six, was 2.1 piglets.

BENEFITS ARE EVIDENT

Genetic improvements have occurred over time and management practices have become more attuned to the needs of the gilt. This has all led to an increase in production. Although 18 percent of the gilts have a heat recorded, there is a clear benefit to observing heats prior to servicing the gilts. Total born and live born numbers improve in the first farrowing and this improvement stays throughout the lifetime of the gilt.

This increase of half-a-pig live born each time the HNS animals farrow equates to a real return on observing and recording Heat No Service events on the gilt.

In addition to total-born increases, farrowing rates were higher on the HNS gilts. Observing and recording HNS would seem to capture the higher ovulation rates that occur on the second cycle. It could also be that gilts that are HNS have...
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To compare the subsequent performance over the lifetime of gilts that had at least one recorded estrus (observed heat) prior to breeding to gilts that had no recorded estrus (observed heat) prior to breeding in your PigCHAMP database you will need to customize and filter the following four reports.

- First Litter Performance Report: Analyzes detailed farrowing information for parity-one sows that farrowed within the user-defined reporting period.
- Reproductive Loss Report: Analyzes the relationship between service performance results based on various production factors; Parity or Cycle, Previous Lactation Length, Age at First Service, Wean to First Service Intervals and Arrival/Gilt Made Available to First Service Interval.
- Subsequent Litter Performance: Analyzes the effects on subsequent litter performance based on the first parity performance of a sow (Farrowed Gilts). Users are able to analyze the first parity total born, live born and stillborn; the effect the number born has on sows’ subsequent number-born performance.
- Age at First Service Analysis: Analyzes the age of gilts at first service and the effect age has on their subsequent performance. A scattergraph format compares age versus total born, liveborn, stillborn, mummified, farrowing rate and repeat rate. The report also includes a histogram representing the age structure of the gilts first served in the reporting period.

For instructions on how to use the report customization tool, please refer to your program user guide, help files and/or watch the how-to video, “Customizing Reports in PigCHAMP Care 3000,” available in the PigCHAMP University library at www.pigchamp.com.

For all reports, you will need to add the following variable to each report using the Custom Report Items feature:

**Analyze the Impact of Managing Gilt Service Interval on Lifetime Gilt Performance**
Figure 6: 2008 Gilt Entries with Subsequent Total Born Over 6 Parities

Figure 7: 2008 Gilt Entries with Subsequent Live Born

For customers using the PigCHAMP Reproductive-only version, the reporting item needed for the filter will be located under the General Section > select Number of Gilt Heat Detections

For those customers using the newly released Farrow to Finish program, the reporting item needed for the filter will be located under the Mating Department Events > Observed Heats > select Gilt Observed Heats

The Gilt Heat Detections/Observed Heats variable results in the total number of recorded observations that have occurred before the gilt was served for the first time for each individual female included within the defined reporting period. After having added it to each custom report, please save the report settings for future use within the program.

To analyze the impact on the lifetime performance that gilt heat detections have; select each individual report and define the dates according to females you wish to analyze. After the report is processed, you will apply two separate filters to the results using the same custom-added variable.

For instructions on how to apply filters to a report, please refer to your program user guide, help files and/or watch the how to video, “Applying Report Filters in PigCHAMP Care 3000,” available in our PigCHAMP University library at www.pigchamp.com.

The below filters will be applied separately to the processed report; once the filter is applied to the report, the results will be specific to the females that meet the filtered criteria. After the filter is reapplied, it will remove the report as a PDF and/or export results to Excel.

1. Filter for gilts with a recorded estrus (observed heat): Gilt Heat Detections/Observed Heats > 0 (Figure 1)

2. Filter for gilts without a recorded estrus (observed heat): Gilt Heat Detections/Observed Heats = 0 (Figure 2)
HOG FUTURES ARE IN HOG HEAVEN!
It’s more important than ever to manage your risk.

By Moe Agostino

The last time hog futures achieved record highs was when the June 2009 futures contract reached US$100.30/cwt in the summer of 2008, when China was buying a record amount of U.S. pork for the Summer Olympics. Unfortunately, when this Chinese demand evaporated, coupled with the global recession in the fall and winter of 2008 and the drop in feed prices, hog futures fell hard.

In 2011, we see a repeat of 2008. Hog supplies continue to shrink. The U.S. supply is down 7 percent since 2007 in response to higher feed prices and strong domestic and export demand. Still, export demand is about 3 percent lower than 2008 and feed prices are trading at record highs of US$7.70/bushel.

The triple threat of lower supplies, higher feed costs and better domestic and export demand as domestic and global economies improve have sent hog futures soaring to new all-time record highs of US$104.45/cwt for the August 2011 futures contract (see Chart 1).

PIGS CAN FLY!
The question now is can we climb into unchartered territory, or how high can we go in 2011? From the latest USDA Quarterly Hogs and Pigs Report, it looks like expansion remains at bay with a 0.5 percent increase. However, supply is still higher than expected due to record productivity gains and carcass weights that are more than 5 lbs. heavier than any other year in recent memory. Some people believe this is due to higher quality corn in 2010. Last year was a record year for hog weights, with an average live weight of 270.5 lbs. (122.7 kg) (see Chart 2).

If it were not for the higher hog weights, hog supplies would be that much lower and hog prices that much higher. Seasonally, hog weights fall as the weather warms up. Despite record hog prices at the retail level, domestic demand remains strong and export demand for the month of January 2011 was up 17.2 percent compared to the same period a year ago. U.S. pork exports are expected to increase by 10 percent in 2011. This would represent a record 21 percent of domestic production. This means the available supply in the U.S. will drop by as much as 3 percent in 2011.

In fact, the U.S. pork cutout value is trading at US$28/cwt – more than any previous year for this time of the year, and traded at US$94.28/cwt on April 7, 2011, just shy of the record high on August 24, 2010 at US$96.74/cwt. (see Chart 3 below).

DISEASE CONCERNS
Foot and Mouth Disease in South Korea seems to be spreading across Asia and these countries (including China) could see more imports of U.S. pork in the coming months. The United Nations Food and Agriculture Organization (FAO) is urging authorities...
in eastern Asia, South Korea and North Korea to proactively vaccinate animals in an effort to stop the spread of Foot and Mouth disease.

In a direct quote, Dr. Juan Lubroth, FAO chief veterinary officer, said “The current FMD dynamics in eastern Asia, as well as the magnitude of the outbreak in South and North Korea, are unlike anything that we’ve seen for at least half a century.” As of April 4, 2011, over 33 percent of all South Korean pigs have been culled.

On top of this, we have U.S. cattle herds that have dropped to the lowest level in 50 years and it typically takes more than two years to increase the size of the overall cattle herd. This means prices will likely stay very high for some time.

**KEY TAKEAWAY**

*A further increase in demand by Asian countries purchasing U.S. pork could be the catalyst that is needed to take hogs to higher “hog heaven” prices, aided by record high cattle prices. Eventually the “cure for high prices is high prices” – high prices usually lead to expansion, which corrects high prices. Manage your risk, manage your volatility!*  

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**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.
FIND PROBLEMS FASTER WITH PROPER USE OF RECORDS

Use breeding herd records to diagnose reproductive disorders.

By Michelle Sprague

Breeding herd records are central to our industry and our daily lives. As the old adage goes, “You can’t manage what you can’t measure.” Record systems help producers track every possible production parameter in an effort to measure, monitor and, ultimately, manage these parameters.

Routine surveillance of production records can help identify aberrations before they become clinically obvious (or at least obvious enough to warrant a phone call to the veterinarian). These observations may not point to a health or production concern, but warrant investigation.

For the purposes of this article, let’s assume that all production-record information is accurate. Of course, in the real world, that is one variable that must be verified. Special instructions are often necessary when asking farm employees to correctly classify mummified and stillborn fetuses. Likewise, pregnancy-rate reports are only as good as a breeding technician’s ability to detect estrus and confirm pregnancy. When assessing records, remember the constraints of each particular data system and that the data generated is only as accurate as the information that is entered.

MONITOR KEY BREEDING PARAMETERS

Farrowing rate serves as a barometer for reproductive issues, or lack thereof, in a herd. Decreased farrowing rate can be an indicator of many causes of reproductive disorders. To more accurately depict the clinical picture, one should assess conception rate and wean-to-first-service interval.

Most production data systems can generate reports that categorize returns as regular or irregular, which can be helpful in troubleshooting reproductive problems. Analysis of a farrowing-rate report is beneficial in determining the time at which females are identified as not pregnant. This can assist in ruling some causes of reproductive failure into or out of the list of differential diagnoses. All of these reports can bring added value when run by parity.

If average conception rate is poor, management issues are more likely the culprit than health concerns. Some key factors that may play a causative role include poor semen quality, inappropriate semen handling, inadequate estrus detection (including boar exposure), improper insemination technique, incorrect timing of insemination and moving (or otherwise stressing) sows during the period of implantation. Most of these situations will result in a regular return to estrus and will be reflected on the farrowing rate report as a higher-than-normal number of females falling out of their cohort group at three to four weeks post-insemination.

Investigation of poor conception rates often points to semen not being handled appropriately. Stray voltage also can cause reproductive losses; upon in-depth investigation of poor fertility rates, stray voltage has been identified as the cause for reproductive losses in two herds within our system. In addition, inadequate stall acclimation and/or lack of heat-no-service to gilts has been identified as a cause of inferior gilt conception rates.

REVIEW HISTORICAL RECORDS

Looking at reports year-over-year can be helpful in diagnosing seasonal infertility. Some sow farms seem to be more affected by seasonal fertility than others. Also, some pure-line females tend to experience seasonal infertility to a greater degree than most crossbred dam lines. Running reports and analyzing seasonal trends over several years can help confirm seasonal infertility as a routine problem.

CONSIDER OTHER FACTORS

Other circumstances that may result in low conception rates include poor body condition, short lactation length, low lactation feed intake, small litter size and low suckling intensity of recently weaned piglets. These situations

Record systems help producers track every possible production parameter in an effort to measure, monitor and, ultimately, manage these parameters.
Lactation length has been increased on a number of farms in the AMVC system through the addition of farrowing rooms in an effort to improve performance, both at the sow farm and in the wean-to-finish flow. These efforts have been met with success, resulting in higher farrowing rates and more piglets born alive per litter in every instance.

Presence of stillborn piglets may or may not be an indicator of reproductive problems. A low number of stillborns may merely be reflective of large litter size, birth order and/or prolonged farrowing. When coupled with the presence of mummies, however, stillborns may have more diagnostic value, as the likelihood of disease is increased.1

PUTTING IT ALL TOGETHER

Record systems that are in place today make it simple to compile and analyze data. While one performance parameter may point to a reproductive disorder, looking at a combination of different factors helps narrow the list of differential diagnoses. Once the list of differentials is generated from the clinical picture and the performance records, one must use other resources to further characterize the etiology. One must investigate a number of factors, including quality of water, air and environment, vaccination procedures, semen handling and breeding techniques for valuable insight. Other things to consider include diagnostic tests for pathogens and feed analysis for vitamins, minerals and mycotoxins.

Remember, your records are only as good as the data entered. Play close attention to accuracy, then use the information gathered to monitor previous production to make future improvements.

Editor’s Note: Michelle Sprague, DVM, is director of sow farm health management at AMVC LLC in Audubon, Iowa. This article was originally published in the 42nd Annual AASV Meeting proceedings.

REFERENCES
EXAMINE NEW TRAITS TO GAIN HERD PRODUCTION EFFICIENCY

By Caitlyn Abell, John Mabry, and Ken Stalder

Historically, the majority of the selection emphasis for maternal line selection has focused on number of pigs born alive and 21-day litter weight. While these traits adequately measure overall sow productivity, selection based on these two traits alone would not incorporate sow efficiency evaluation or measurement. Just because a sow can produce a litter with a large number of heavy piglets at weaning, does not mean that she is profitable to the producer. She must be very productive (number born alive, number weaned and weaning litter weight), be consistently productive (return to estrus in less than seven days after weaning, conceive on the mating and farrow a litter 121 days later for every parity), and remain this productive over a high number of parities (at least three, preferably more). Females capable of meeting these requirements will allow a pork operation to be profitable over the long term, assuming market prices cooperate.

IMPORTANCE OF LITTERS/SOW/YEAR
Number of litters per sow per year (LSY) is one trait that can be used to improve sow production while also improving sow efficiency. This trait is a measurement of how quickly a sow can produce a litter and begin gestating her next litter. The components of LSY are:

- Entry-to-first-service interval
- Gestation length
- Wean-to-service interval
- Farrowing rate
- Farrowing interval
- Culling-to-removal interval

Opportunities to improve the individual components of LSY vary. Entry-to-first-service interval is herd-dependent and based on the swine operation’s management system. For example, some farms enter the replacement gilt into their record-keeping system when they take delivery of a group of replacement gilts, while other producers enter females into the record system when they are bred. The entry-to-first-service interval variability is non-genetic and hence, selection to improve this trait would be ineffective. Gestation length is heritable; however, biology dictates that little variation exists for this trait, which prevents efficient improvement through selection. Typical gestation length is 115 days (three months, three weeks, three days). It can be as low as 112 days and as high as 118 days and still be considered normal. If we attempt to change gestation length through selection, adverse results are likely. If the gestation length is too short, piglets are not fully developed and may not be viable when born. As a result, little, if any, opportunity exists to improve gestation length beyond just a few days and the consistent ability to control gestation length is not likely.

Improvement in the interval from weaning-to-service is also limited by biological constraints. After weaning, sows require a few days to come into estrus before they can be bred. Typically, sows will return to estrus from four to seven days after weaning. Producers need well-developed management practices to ensure proper heat detection. Every sow must be detected in estrus in a timely manner so conception and subsequent farrowing is most likely to occur.

FACTORS AFFECT FARROWING RATE
Farrowing rate is affected by both management and genetics. Sufficient variation exists for farrowing rate such that traditional selection may be effective at genetically improving the trait. Improving farrowing rate can in turn improve farrowing interval through indirect selection by reducing the number of non-productive days attained by sows being open.

IMPROVE LSY – IMPROVE PROFITABILITY
Increasing the LSY of the herd by 0.1 can have a major impact on the profitability of the operation. A 0.1 increase in LSY in associated with 11 fewer non-productive days; assuming a cost of $2 per non-productive day per sow, this decrease amounts to $22 per sow per year. A 0.1 increase in LSY also is associated with an increase of one pig born alive per sow per year. This increases revenue by $22 per sow. For a 2,400 sow herd, a 0.1 increase in LSY results in $52,800 in decreased costs due to non-productive days, and an increase in revenue of $52,800 due to more piglets born alive.

It is also important to consider the relationships between LSY and other economically important traits before incorporating LSY into a selection program. Table 1 shows the heritabilities, genetic and phenotypic correlation estimates between LSY, number born alive, wean to estrus, percent lean, backfat and days to 100 kg (220 lbs.). The genetic correlation estimates with LSY are not significant except for the genetic correlation between LSY and wean-to-estrus. The correlation between LSY and wean-to-estrus is large in magnitude and favorable. The insignificance of the other genetic correlations suggests that selection for LSY would not adversely affect the other four traits considered.

A CAUTION
One caution that must be taken when using a calculated trait such as LSY is that simply improving the raw values of the trait may have undesirable consequences. Sows removed
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immediately after weaning their first parity have an inflated value for LSY. In a system where gilts are brought into the sow herd after they are already bred, these females have not had the opportunity to accumulate any non-productive days. Having a high replacement rate would increase the number of gilts in the herd, and thus, inflate the overall LSY of the herd. A herd that culls an excessive number of gilts immediately after weaning would often have a very acceptable LSY. However, the increased proportion of gilts in the herd would lower overall production because of the productivity differences (number born alive, number weaned and litter weaning weight) and adversely impact any measure of longevity. Ultimately, improving the LSY in a sow operation by having a large proportion of gilts in the herd that are culled after their first litter will decrease production efficiency and reduce an operation’s profitability. Gilts don’t have the opportunity to fully express their potential for LSY. Because of this, there is no basis for ranking gilts based on their affinity for the trait.

Improving LSY can result in increased herd production efficiency by increasing the number of piglets produced in a year by a single sow. An increase in the number of pigs weaned per female per year can improve herd production efficiency in a similar manner as LSY. Many of the components are the same for both traits. Using production efficiency traits can improve the overall profitability of a pork operation by keeping sows in the breeding herd that can produce large litters of heavy piglets in an optimum amount of time.

Using a consultant or an audited bench-marker can be a big plus.

Similar societal studies are being carried out with respect to global water use. A full 70 percent-plus of all water demanded by humans for any use is allocated to irrigation. Measuring the full-chain consumption of water necessary to deliver a pound of pork carcase compared to a pound of potatoes is eye-opening. Fear of water taxes and water shortages and the need to ensure long-term food security has fueled purchasing and leasing of water-rich, arable land masses in Africa and Brazil by emerging nations (like China). Korea recently placed a 99-year lease on a land mass for growing corn in Madagascar that is larger than the nation of Belgium.

**BENCHMARKING MUST EVOLVE**

Margins have been difficult to benchmark in the past, as many firms have adopted firm-specific accounting practices. While acceptable to auditors, these practices are highly individualized and difficult to unpack for standardized comparisons. Some organize and group cost and revenue information to roll up into the larger integrated farm’s account structures, chart and formats. In some cases, certain charges are not made directly for some services – they are lumped into G&A and a percent of total cost is allocated. It is common for standard costs to be substituted for traditional cost roll-ups. Revenues and expenses are often managed for tax strategies too, which can make comparisons among firms difficult. Audited benchmarking firms have usually found ways to harmonize these inconsistencies, but sometimes only footnote explanations are made to note significant departures, hindering standardized comparison.

In an age of damaging price and cost volatility, margins gain increased focus rather than the component parts (like feed cost and market hog prices) when analyzed independently. We live in a time when margin protection through coordinated futures markets transactions (the “crush”) combined with risk-shifting packer agreements make comparisons among firms very difficult. If we were to discover the true cost of production today for the top 100 pork producers, it would look like the array of ticket prices one would find if all the airfares paid on any given flight within the U.S. were revealed. Gone are the days when knowing today’s corn and bean meal prices gave you strong insight into current costs of production. Those prices and costs may have been established weeks ago. Locking in a “high” corn price weeks ago is not necessarily a poor decision if hog prices were also hedged at the time to provide an expected margin that is higher than the current market is offering.

Being able to compare profit achievement (gross margin, net income, ROE, ROI or ROA) over time is the bottom-line benchmarking achievement, and then benchmarking physical processes that accompany profit achievement completes the picture. Since all physical quantity and input efficiency benchmarks roll up into profits, it is important that both are measured.

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**Editor’s Note:** Caitlyn Abell is a graduate student at Iowa State University; John Mahry, PhD; and Ken Stalder, PhD are part of the Department of Animal Science at Iowa State University, Ames, IA.

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**TABLE 1**

Heritabilities (on the diagonal), genetic (above the diagonal) and phenotypic correlations (below the diagonal) (±SE) for reproductive and post-weaning traits estimated from an Irish commercial swine breeding company.

<table>
<thead>
<tr>
<th></th>
<th>LSYb</th>
<th>D100</th>
<th>PCL</th>
<th>BF</th>
<th>NBA</th>
<th>W2E</th>
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</tr>
</tbody>
</table>

* The dataset contained 32,692 litter records of Landrace, and Yorkshire sows from November 1992 to December 2010. A total of 7,674 sows from 4 herds were used in the analysis. There were 44,040 growth records in that data set. Heritabilities and correlations were calculated using ASREML.

* Number born alive (NBA) and wean to estrus (W2E) were collected on every litter. Litters per sow per year (LSY) was calculated as described in the text. Adjusted backfat (adjusted to 100 kg) (BF), days to 100 kg (D100), and percent lean (PCL) were calculated post-weaning.
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GROW/FINISH DATA: AN UNTAPPED RESOURCE

Use your own data to make informed decisions.

By Stephanie Rutten-Ramos

From weekly performance monitors in the sow herd to group closeouts in finishing, pork producers are accustomed to looking at data. Targets are established, performance is compared and improvements are pursued.

When it comes to improvement insights, however, nursery and finishing data can be challenging. Unlike sow information, which is tracked to the level of the individual, nursery and finishing data largely rely on measurements summarized to the level of the group – average ages and weights of pigs in and out, for example. Further complicating matters is the fact that performance expectations – average ages and weights of pigs in and out, for example. Further complicating matters is the fact that performance expectations change as pigs grow, since bigger pigs gain faster but less efficiently.

This can make group comparisons difficult and misleading. Although Excel makes it easy to generate a two-variable scatterplot with added “trendline,” few relationships in pig production are that simple. Yet understanding the relationships and subtleties of the data is critical for improvement.

Some parameters vary by season (for example, feed consumption is better with new-crop corn). Other parameters, like mortality rate, may vary with the type of pigs placed (i.e., gilts/barrows/mixed groups).

In the pursuit for improvement, distinguishing which variables are related to outcomes is important for two reasons. First, interventions can have great benefit if they can be applied at the right time – the difference between best management practices (fire prevention) and pig treatments needed for not incorporating those practices (fire fighting). And second, differentiating between the potential for local improvement and system-wide improvement allows a system to efficiently use its resources.

Remember that no two systems are identical. There are differences in herd health levels, maturity and genetic base. There are differences in regions, facilities and feedstuffs. Even diet formulations within a system may vary according to ingredient costs and season of the year. That being said, the remainder of this space will be used to explore some relationships between performance measures and group descriptors for a set of finishing data.

A LOOK AT FINISHING DATA

This dataset reflects one year of production from a mixed-sex finishing system supplied by three different pig sources (89 groups). Their outcomes of interest are mortality rate, average daily gain (excluding live weight gain by deaths), and carcass weight/pig. The factors of interest are source [Flow], the time of year in which pigs were placed [StartQtr], and Pigs in Average Weight [StartWt]. For analytical purposes, Pigs in Average Weight was ranked low to high within Flow and divided into three categories: Light, Medium, and Heavy.

MORTALITY RATE

Figure 1 is a histogram of mortality rates from the dataset. Figures 2-4 depict relationships between mortality rate and Pigs In Average Weight.
Weight, Flow, and both Flow and Pigs In Average Weight category. By simultaneously considering both Flow and the Pigs In Average Weight category, this system finds not only that Flow B has a higher mortality rate, but also that mortality rates are significantly higher in the lightest third of groups placed. With this knowledge, the system can develop strategies to reduce mortality with interventions specific to Flow B and, especially, Flow B lightweight groups.

**AVERAGE DAILY GAIN**

Figure 5 is a histogram of average daily gains. Figures 6 and 7 depict relationships between average daily gain and Flow, and average daily gain and StartQtr. For this dataset, average daily gains differ across both StartQtr and Flow, but not Pigs in Average Weight. There was no interaction between Flow and StartQtr, indicating a seasonal gain pattern consistent across all sources. With this knowledge, the system can target interventions both by Flow and according to the time of year when pigs are placed.

**BEST PRACTICES YIELD RESULTS**

Even if an industry isn’t operating on thin margins, it only makes good business sense to employ practices that yield results. Many systems have a standard set of best practices, yet differences in system inputs (pig size, health, feedstuffs) and facilities (barn style, feeder types, etc.) may warrant interventions. When a system can identify characteristics of groups less likely to achieve production targets, it can direct interventions only to those groups most likely to benefit. If, however, there are no real differences in group performance across the descriptive variables, then system-wide interventions should be considered.

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**Editor’s Note:** Stephanie Ruten-Ramos received her DVM and PhD from the University of Minnesota and is an independent consultant. To contact her, email: rutt0011@umn.edu.

For CARCASS WEIGHT/PIG data go to www.benchmark.farms.com

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For CARCASS WEIGHT/PIG data go to www.benchmark.farms.com
DIETARY GUIDELINES FOR THE BREEDING HERD

The updated National Swine Nutrition Guide is a helpful resource.

By David Meisinger

The National Swine Nutrition Guide (NSNG) is a sensible, easy-to-use source of nutrition information and recommendations. Its companion piece, the Diet Evaluation and Formulation Software DVD, is also very user-friendly and has the flexibility for producers to custom-build their rations based on feedstuffs available, their own nutrient analyses of feedstuffs and their own desires as far as the final nutrient makeup of the diet is concerned.

The breeding herd is divided into considerations for gestating and for lactating sows. For gestating sows in early stages of gestation, successful conception and embryo survival are the most important factors to success. For mid-gestation, growth and development of the fetuses and increasing or replenishing body nutrient stores is critical. In late gestation, the emphasis is on fetal growth and mammary development. We want large, vigorous litters of pigs at farrowing from sows equipped to produce large quantities of milk. The ultimate goal is to have females that can have long productive lifetimes at a reasonable economic cost.

Gestation feed intake inversely affects lactation feed intake. To maximize lactation feed intake and sow performance, gestation feed intake must be limited. Over-feeding of gestating sows compromises mammary development, depresses feed intake during lactation and increases birthing difficulties. Under-feeding of gestating sows can cause failure to recycle, lower conception rates, smaller subsequent litter size and even fatigued-sow syndrome. The three components of nutrient requirements of gestating sows include maintenance, fetal growth and maternal weight gain.

PRODUCTIVE SOWS HAVE SPECIAL NEEDS

The primary challenge of feeding highly productive sows involves minimizing the negative nutrient balances that often occurs during lactation in order to minimize short-term and long-term reproductive performance problems. Lactating sows need energy and other nutrients to maintain body tissues and support milk production, a particular challenge with today’s more prolific females.

Excessive body-weight nutrient loss (high negative nutrient balance) can lead to:

- Short-term reproductive problems, such as extended wean-to-estrous interval and smaller subsequent litter size
- Long-term problems, including a high culling rate of the sow herd that results in low average parity, reduced pigs weaned per reproductive lifetime and higher genetic cost per pig produced

Excessive negative nutrient balance during lactation can be minimized by increasing sows’ voluntary feed intake (easier said than done), or, to a lesser extent, increasing nutrient concentrations in the diet.

FACTORS AFFECTING FEED INTAKE

Understanding the different factors that affect nutrient requirements and feed intake can assist in developing a successful lactating sow feeding program.

Because maximizing daily nutrient intake during lactation is so important to minimize nutrient drain from body tissues, a brief discussion of the different factors that affect feed intake is necessary:

Parity: Lactating-sow feed intake increases from the first to the sixth parity, with the biggest increase occurring between the first and second parity (15 – 20 percent).

- Sow lactation feed intake is often not enough during parities 1 and 2 to meet maintenance and milk production needs
- Research has shown if these sows mobilize more than 15 percent of their protein mass during lactation, subsequent reproductive efficiency and litter weaning weight are reduced
- First-parity sows are still growing and thus may have lower body stores of fat, protein and minerals from which to draw

Sow condition: Over-conditioned sows consume less feed during lactation, while mammary development may be compromised, resulting in reduced milk production

Level of dietary protein: Reducing the crude protein level of the diet from 16 or 18 percent to 12 or 14 percent has been shown to reduce feed consumption. Consequently, sows will experience increased weight loss over the lactation period, as well as reduced piglet weaning weights. Particular care must be taken if formulating lower-protein diets to ensure essential amino acid requirements are met. Otherwise, delays...
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The goal should be to maximize feed intake as soon as possible following farrowing and throughout lactation to minimize sow body weight loss, maximize growth rate and optimize subsequent reproductive performance.

in subsequent wean-to-estrus period and poorer subsequent conception rates may occur, especially in first-parity sows.

**Feeding frequency:** Feed diets at least twice daily (preferably three or four times) to lactating sows in order to keep feed fresh and encourage increased voluntary feed intake. The value of increased sow observations and the need to remove wet or spoiled feed cannot be stressed enough.

**Diet form and feeder design:** There appears to be no appreciable improvement in litter weight gain, sow feed intake, or sow weight loss by feeding pelleted diets compared to ground mash, although feed wastage may be considerably reduced. The additional cost of pelleting must be compared to estimated reductions in feed waste to determine if pelleting is economically feasible. Improper feeder design may restrict the sow’s ability to consume maximal levels of feed, and can also lead to increased feed wastage. Bars, rods or other types of items in feeders tend to restrict access, as well as overall size. Generally, the larger the feed pan, the better. Average particle size of feed should be around 700 microns to provide optimum sow performance (utilization of nutrients in the feed is greater with smaller particle size). This particle size also allows adequate feed processing efficiency and feed flowability while minimizing the occurrence of ulcers due to finely ground feed.

**Water:** Quality and quantity of water must never be restricted, otherwise reductions in feed intake and associated performance parameters will occur. A lactating sow can consume up to 7 gallons of water daily. A water-flow rate of 1.5 to 2 pints per minute is recommended for nipple waterers, which need to be checked periodically.

**Environmental conditions:** High farrowing room temperatures (above 70 degrees fahrenheit) will depress voluntary sow feed intake. Utilize zone heating and minimize drafts to keep piglets warm and allow room temperatures to be reduced to the 65 to 70 degree F range.

**Wet versus dry feed:** Wetting of sow feed at feeding can increase intake by 2 lbs./sow/day during hot weather, but requires extra time and attention, both for getting the feed wet and cleaning up uneaten feed.

**Feed access:** Make sure sows have access to feed over the evening/nighttime periods during hot weather; when temperatures are cooler, lactating sows will consume 20 to 25 percent more feed.

**Feeding methods:** Regardless of feeding method, the goal is to maximize total feed intake during the lactation period.

Many farms choose to gradually ramp-up feed allowance during the first week post-farrowing before providing feeding levels. Compared to more aggressive feeding systems that challenge sow intake within the first few days post-farrowing, these restricted feeding systems can reduce sow feed intake by up to 15 percent during the first week of lactation. Concern is often that sows will go off feed mid-lactation due to early overfeeding. Data indicates 10 to 30 percent of all sows will exhibit a dip in feed intake during the second week of lactation, irrespective of early feeding level. Thus, the goal should be to maximize feed intake as soon as possible following farrowing and throughout lactation to minimize sow body weight loss, maximize growth rate and optimize subsequent reproductive performance.

**MUCH MORE INFORMATION**

The NSNG is a very dynamic source of information with several updates planned over the next few years, as more information becomes available on alternative feedstuffs, on immunological castration, on improved genetics, etc. The Guide is available for viewing or ordering on the U.S. Pork Center of Excellence website at www.usporkcenter.org.

**Editor’s Note:** Dr. Meisinger is executive director of the U.S. Pork Center of Excellence. Read his article on nursery and grow-finish pig nutrition at: www.benchmark.farms.com.
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When the PigCHAMP Care 3000 software program was introduced in 2007, it quietly marked an important turning point in commercial pork production. PigCHAMP had taken the combined knowledge of nearly 30 years of working with producers, consultants, veterinarians and allied industry to create the standard in reproductive record keeping and analysis for the next 30 years. Within six months, the new PigCHAMP became the most widely used swine program in North America. The establishment of this as the premier tool for efficiency and profitability continued over the past year with strong acceptance of the program in places like China, Russia and Africa to name a few.

PigCHAMP’s next endeavor was to take on the problem of getting data from the barns into the program accurately and at a lower cost. The PigCHAMP Mobile system seems to have hit that nail squarely on the head. This system allows producers to enter data in the barn on a handheld computer and synchronize it electronically to the PigCHAMP application. There is no need to enter data again. The handheld also performs data validation so mistakes in writing something down or mistaking a “7” for a “1” in data entry are eliminated.

The handhelds provide handy action-list reports and complete sow histories. This system has been equally appealing to large operations that can eliminate tens of thousands of dollars in data entry expenses, to the small-to-medium family operations. These producers have better things to do when they come in from a long day in the field than entering sow data.

**AND NOW, GROW-FINISH**

Our most exciting accomplishment is our most recent... the PigCHAMP Grow-Finish program. If you have not seen it yet, it’s time to have a look; you will be pleasantly surprised. Reporting strategies that you thought weren’t possible, or only possible with a convoluted system of spreadsheets and databases that never quite worked, are now available with the click of a button. All-in-all-out or continuous flow...it’s covered. Bring in weaned pigs from the farrowing barn or purchase pigs from the outside... no problem. The PigCHAMP Grow-Finish program deals...
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.

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with split groups and accurately provides feed efficiency and average daily gain, manages feed budgets and provides profit and loss information on a specific group, barn or location. There are too many additional features to mention here, but PigCHAMP Grow-Finish is that last component of the foundation that will keep PigCHAMP the market leader for many years to come.

SO WHAT’S NEXT?
Commercial swine record-keeping systems have focused on detailed activities of what goes on in the barn. Is the sow open or bred, how many pigs were born/weaned, what’s the farrowing rate, conception rate, pre-weaning mortality, etc.? On the finishing side you have death loss, average daily gain, feed efficiency and profit/loss information. A good record-keeping and reporting program should be providing everything you need in these areas.

In the future, it will be important to connect this data with other information sources that can be used to make better decisions faster. For example, monitoring and managing equipment like automated feeding stations, feed bins and watering equipment will be a priority. The ability to record temperature and humidity and see the impact of changes on performance also will be important. Having this information available together and controlled through a single system interface that can be accessed from anywhere will be necessary.

THE AGE OF “JUST-IN-TIME”
We tend to cringe when we hear the phrase, “factory farming.” but there are lessons to be learned from other industrial settings that provide direction for what opportunities are available and possible in the swine industry. The ability to use information from throughout the production chain to help drive efficiencies, better decision making, and ultimately, profitability for all stakeholders in the pork production industry is becoming a reality.

Many industries bring inputs into their factories using Just-In-Time (JIT) production techniques. One of the principles of JIT is that any excess inventory of parts is wasteful and profit robbing. As a result, manufacturers share production information with parts suppliers and demand that parts arrive “just-in-time” to be used in the assembly line. Ideally, parts would come off a truck and directly to the assembly floor to be used. This avoids the need for storage and warehousing, therefore lowering production costs as well as the administrative costs of placing orders and managing inventory. The right parts are delivered at the right time without having to place individual orders or make frantic phone calls to fix an inventory outage.

How would our industry change if the right feed just showed up at the right bin when it was needed? What about animal health products or replacement gilts? Outrageous? Not necessarily. PigCHAMP is working with “upstream” suppliers to pork producers, including the feed industry, genetics companies and others to provide efficiencies in the supply chain to explore JIT opportunities for pork producers.

On the “output” side, there is a huge opportunity for producers and packers to each gain value if certain information is more openly available. If packers could have real-time information on the potential supply from producers several weeks in advance, they could do a much better job managing their inputs (pigs) in a Just-In-Time manner and developing delivery schedules that best meet their production schedule and optimize producer profitability.

Packers could provide individual carcass data back to producers in a way that would help them understand the degree of variability in groups of hogs from different locations and help determine the reasons for this variability in ways that can be addressed. A really good grow-finish program should be able to accommodate this.

In the future it will be important to connect PigCHAMP data with other information sources that can be used to make better decisions faster.

CONNECTIVITY EQUALS VALUE
These are examples of extending the connectivity of information needed to create new value in products throughout an extended value chain that can be shared by multiple stakeholders. Other industries have been doing this for years. This isn’t a dream of what might happen someday; it can’t be if we want to stay competitive. This is what PigCHAMP is working on. Now.

Thanks to all the producers, allied industry and other experts who have been helping us think about these opportunities. If you have ideas about what the future should look like, we would love to hear from you.

Editor’s Note: Bob Brcka is the general manager of PigCHAMP Inc., a member of the Farms.com Family of Companies. Email him at: bob.brcka@pigchamp.com.

BENCHMARK ONLINE RESOURCES
The articles from this magazine and from the previous annual issues are available online for free at www.benchmark.farms.com. The Benchmark website also has hundreds of additional articles and information from leading experts on how to improve your pork operation. There are also links to related video clips from the Farms.com Swine Youtube Channel at www.youtube.com/swinetv.
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HR OUTLOOK SHOWS IMPROVEMENT
Revitalization of the pork industry bodes well for employees and employers, but now is the time to make sure you can retain top performers.

By Cindy Walter

The improvement and growth of the agriculture economy means more jobs are becoming available within the industry. “The outlook for hiring employees in the pork industry is excellent for 2011,” says Eric Spell, president of AgCareers.com. “This year, we’ve seen a significant increase in job listings in the pork industry on AgCareers.com.”

AgCareers.com is the leading online job board, website and human resource services provider for the agriculture, food, natural resources and biotechnology industries. When comparing North American first-quarter figures from 2010 and 2011, the number of pork industry job listings on AgCareers.com almost tripled in 2011, from 55 to 150.

INDUSTRY REVITALIZED
The revitalization of the pork industry is apparent through job listings and is good news for producers, but there also is need for concern. As the job market expands with opportunities, many companies fear that top performers will seek employment elsewhere. These employees could potentially seek new jobs with other competitors within the pork sector or outside in the robust agriculture industry.

Like business owners in other market segments, owners of pork operations took drastic measures by cutting costs to ensure profitability in the face of challenging economic conditions. The effect of those strategies could be detrimental if companies neglect to make adjustments to retain their top talent. When head count is reduced, remaining employees become increasingly vital to a company’s core operations. These employees become more valuable through cross-training, decision making, and multitasking across a larger scope. From an employee perspective, this is a great opportunity to increase your skill set and further develop your expertise. However, these new-found skills can also lead employees to seek advanced opportunities outside the organization.

LOOK INWARD
In an effort to retain core employees, company leaders are advised to closely evaluate the impact of changes made within their organization in the last year. One specific area of concern for many employees and companies alike is compensation. Fair compensation practices and benchmarking may have been forgotten during the recent economic ups and downs.

“Compensation benchmarking is important because salary is a key factor in employee engagement,” explains Spell. Precedence in making salary adjustments as budget becomes available should be a priority, especially for employees who have had an increase in job responsibilities due to workforce reduction. But, how do companies know what fair compensation is today in the pork industry? How much of a salary adjustment should be made?

SALARY SURVEYS CAN HELP
Investing in a salary survey is the best way to gain insight into current market trends. The salary survey will provide information on compensation components (salary and benefits) and also can be used to benchmark pay rates against the industry, ensuring competitive pay.

“Companies take part in compensation surveys because the benefits far exceed the costs,” notes Spell. One of AgCareers.com’s feature products is the Compensation Benchmark Review™ (CBR), a confidential agribusiness salary survey. The CBR helps participating companies learn how their employee salaries compare to others within the same sector and across agribusiness. This online tool generates reports on salary and benefits data for specific positions in the ag industry, including swine production and animal health.

There are numerous benefits to implementing a compensation strategy within an organization. Benchmarking compensation packages for a role such as sow farm manager can help companies determine where they need to make improvements and focus efforts based on a customized strategy that supports business goals. Identifying the roles of importance within business operations and being able to benchmark how salaries and benefits compare to competitors, within and outside of the pork industry, allows for a competitive advantage.

“The CBR helps companies construct competitive benefit plans to put them ahead in the marketplace,” summarizes Spell.

Employees are a valuable component of successful operations. Keeping a positive relationship and atmosphere will help employees remain engaged and satisfied with their positions.

Editor’s Note: Cindy Walter is a sales associate with PigCHAMP and is assistant web content coordinator with Farms.com.

The Compensation Benchmark Review is available to subscribed participants year-round. Please email or call today to find out how you can become involved and start benchmarking your company’s positions at 800.929.8975 or compensation@agcareers.com.
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¹ Genetic comparison of viruses characterized by the University of Minnesota Veterinary Diagnostic Laboratory in the last three years demonstrated that 9 out of 10 currently circulating U.S. strains were at least 90% homologous to FluSure XP and/or FluSure Pandemic strains.