Benchmark

PigCHAMP

year in review

Cover Story // Introduction to Benchmarking

Wide Range of Performance
Lactation Feed Intake is Critical
Sow Retention Rates are Low

A Farms.com Publication
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Contents

Volume 2, Spring 2007 • Number 1

Welcome to Benchmark
A message from PigCHAMP and Farms.com

Industry Outlook
Here are some issues facing the industry this year.

Intro to Benchmarking
What benchmarking means, and how you can use it most effectively.

A Summary of the 2006 Data
Productivity is higher, but range of performance is still wide.

Range of Performance
The real question is not the average effect but the variation in effects.

Narrow the Gap
Lower the variability to achieve more profits.

Proportion of Sows Bred by Seven Days
This measure is especially important for internal benchmarking.

Canada Comes Out on Top
Once more, Canadian herds outperform those in the United States.

Lactation Feed Intake is Critical
How much sows eat during lactation has a huge impact on health, pig growth and sow longevity.

Regional Differences Minimal
Production technologies are available to nearly all producers.

Nursery and Grow-Finish Summaries
Standardized methods will help measurement efforts.

Critical Care
Nutritional management of nursery pigs can be the difference between success and failure.

Variation in Sow Farm Output
Benchmarking variation is a new exercise.

Sow Lameness a Problem
Early identification of lame sows, followed by their removal from the herd will minimize the economic effect.

Sow Retention Rates are Low
The costs associated with low sow retention are greater than you think.

The Weather and Sow Mortality
Several important factors can have an effect on sow mortality.

Seasonal Variation in Pigs Born Alive
A four-year study provides additional insight.

Monitoring Sow Inventory
A wide range can mean inefficient use of sow space.

How to Blend the Generations
Generational differences are inherent; here’s how to recognize characteristics and enhance working relationships.
Welcome to Benchmark

Farms.com Ltd and PigCHAMP are pleased to bring you the 2007 edition of *Benchmark – PigCHAMP Year in Review*. This magazine is designed to provide information and analysis that can help you and your pork enterprise.

The data in this review was sent in from operations across North America and represents more than one million sows of production, with additional data from other countries. We encourage you to use the information and expert advice to identify areas in which you are doing well compared to the “averages,” as well as where there might be opportunities for improvement. By sending in data, producers who participate in the PigCHAMP Benchmarking program also receive quarterly updates on how their operations compare to benchmark averages. In addition, PigCHAMP offers in-depth, customized reports for a small fee, but keep in mind there is no charge to participate in the basic Benchmarking program.

PigCHAMP would like to extend a special thank you to John Deen, Sukumarannair S. Anil, and Stephanie Rutten at the University of Minnesota for providing the analysis of the benchmark data. Susan Olson, Benchmarking Manager at PigCHAMP, has worked closely with Dr. Deen to make sure the information in the magazine is as accurate and timely as possible. We also want to acknowledge JoAnn Alumbaugh, Farms.com Director of Communications for her drive and passion to produce this high quality educational material. Finally, the industry sponsors who have advertised in this issue deserve our thanks; this publication would not be possible without their support.

PigCHAMP is a proud member of the Farms.com Family of Companies, and strives to deliver on the mission of the organization, which is to provide: *Innovative Information Products and Services for the Global Agriculture and Food Industries*. We believe the data, analysis and articles provided in *Benchmark* help support this mission. Visit www.pigchamp.com and www.farms.com to learn more about our company, products and services.

We hope you find this year’s *Benchmark* publication helpful in your operation. We welcome the opportunity to discuss how we can work with you in the future.

Graham Dyer
President and CEO
Farms.com Ltd.

Bob Brcka
General Manager
PigCHAMP, Inc.
Looking for that place where meat quality and efficient growth intersect?

Use the map.

The new composite boar line from Monsanto Choice Genetics, Inc. offers uncompromised performance. Beyond traditional breeding programs – beyond even identifying individual genes – Monsanto Choice Genetics has created a detailed map of the swine genome, identifying almost 6,000 genetic markers. By precisely targeting desirable traits through genomics, Monsanto Choice Genetics can offer new boar lines that focus on the most profitable intersection of meat quality and efficient growth.

In the past, breeding for rapid growth might mean compromised meat quality, while selecting for quality could impact feed efficiency. Today, that’s history. And these new boars are just the beginning. As market demands shift, Monsanto Choice Genetics’ proprietary technology will speed development of lines to meet them. The Monsanto Choice Genetics Swine Genome Map shows the way to uncompromised performance, productivity, and profitability.

Visit www.MonsantoChoiceGenetics.com for the whole story – learn how the future of the industry is being mapped out.
PORK INDUSTRY OUTLOOK
New challenges join existing issues to keep life interesting for pork producers.

By JoAnn Alumbaugh

Being a pork producer is like climbing a mountain: at times the footing is steady and the handholds are sure. At other times, an avalanche or an unexpected thunderstorm races your way, and you’re forced to find shelter. Often, the challenges are external but internal difficulties can also be devastating. That’s where the use of benchmarking as covered in this magazine can lead to herd improvement.

There will never be “smooth climbing” without squalls. As sure as one problem is solved, another will take its place. But that is the case regardless of your business, and it’s a fact of life that not all businesses will survive. While there are many topics of concern in the pork industry, here are five economically important challenges to watch and plan for.

1 IMPACT OF ETHANOL
The portion of the U.S. corn crop used for ethanol production was less than 5% 10 years ago, but it was greater than 20% in 2006. The United States currently has 100 active ethanol plants that can produce over 5 billion gallons of ethanol each year. An additional 58 plants are under construction or are being expanded. Another 150 ethanol plants have been proposed. It is apparent that the ethanol industry will compete with the livestock and poultry industries for corn and at least in the near term, impact swine production by causing higher feed costs. According to Dermot Hayes at Iowa State University, the growing demand for corn used in ethanol production in the U.S. has already increased the costs of hog production by approximately 10%.

The National Pork Producers Council has expressed its concerns about the adverse affects on its members of the rapid expansion of the corn-based ethanol industry.

“Pork producers continue to have the jitters over the rapid expansion of the corn-based ethanol industry and the challenges that expansion presents to maintaining our competitiveness with domestic and international meat protein competitors,” states Joy Philippi, immediate past president of NPPC and a producer from Bruning, Neb. “Pork producers believe that to maintain a healthy rural economy — indeed a healthy economy in general — market-based bio-fuels policies and regulations must ensure a balance between the food, fuel and feed needs of the country,” emphasizes Philippi.

According to NPPC, the high demand for corn has pushed the per-bushel price up to $4 from $2 last summer, raising pork producers’ feed input costs to $65 per pig from $35. With that increase, pork production may need to decline by as much as 15% to allow the industry to recoup higher production costs, reports a November 2006 study by Iowa State University’s Center for Agricultural and Rural Development. The Center also estimates that a 30% production-cost increase will raise retail prices for pork, beef, dairy and chicken by 7.5%.

2 ANIMAL CARE ISSUES
Smithfield Foods, the largest pork producer in the country, has announced it will eliminate the use of gestation stalls within the next 10 years. Maple Leaf Foods, the largest pork-producing company in Canada, has made a similar
NAFTA in 1994 and the Uruguay Round Agreement in
361% in value terms since the implementation of the
by more than 389% in volume terms and more than
U.S. exports of pork and pork products have increased
There is also some suspicion that subclinical vertical
horizontally from pig to pig via manure and body fluids.
The virus is spread
significant pathogens but PCVAD is more severe in
affected. The disease can occur in the absence of other
efficiency and reproductive performance are adversely
diagnosis is always required for confirmation.

Porcine Reproductive and Respiratory Disease
Presently, the two diseases of most concern are
PRRS and Porcine Circovirus Associated
Diseases (PCVAD).

PRRS causes abortions, respiratory distress and death
losses of up to 100%. The economic impact of PRRS in a
breeding operation during the year of an outbreak has
been estimated to be as high as $110 to $240 per female.
In nursery pigs, PRRS causes increased death loss and
decreased growth rate and feed conversion efficiency.

While PCVAD is not a new disease, there has been a
widespread epidemic since the mid-1990s. Symptoms
include wasting, difficult breathing, unthriftiness,
enlarged lymph nodes, paleness, jaundice, emaciation,
diarrhea and death (up to 40%). It is endemic in most
pig populations around the world, and a laboratory
diagnosis is always required for confirmation.

PCVAD can cause increased morbidity, mortality and
treatment costs. In addition, average daily gain, feed
efficiency and reproductive performance are adversely
affected. The disease can occur in the absence of other
significant pathogens but PCVAD is more severe in
combination with other agents. The virus is spread
horizontally from pig to pig via manure and body fluids.
There is also some suspicion that subclinical vertical
transmission from sow to piglets may lead to PMWS.

1995. January-November 2006 exports were 1,147,835
metric tons valued at $2.6 billion. This is an increase
of 9% by volume and 8% by value over pork exports
during the same time period in 2005, so it’s easy to see
how important exports are to the pork industry.
The USDA has reported that U.S. meat exports
have generated 200,000 additional jobs and that this
number has increased by 20,000 to 30,000 jobs per
year as exports have grown. Exports are financially
significant. The income multiplier from meat exports
is 54% greater than the income multiplier from bulk
grain exports. Each hog marketed in the United States
consumes 12.82 bushels of corn and 183 pounds of
soybean meal. With an annual commercial slaughter
of 105.3 million animals in 2006, this corresponds to
1.34 billion bushels of corn and 9.63 million tons of
soybean meal. Approximately 16% of this production is
exported, and these exports account for approximately
216 million bushels of corn and 1.54 million tons of
soybean meal.

Trade is important to pork producers. The industry
has identified several priorities for 2007, including
trade promotion agreements with Peru, Colombia
and Panama, as well as extension of Trade Promotion
Authority (TPA). With 96% of the world’s population
residing outside of the United States, producers here
must continue to gain access to potential customers.

The general public, or at least the animal rights
groups, want a say in how food is produced, which
means agriculture will constantly be faced with new
challenges. This is the world we live in. People in affluent
societies have the time and money to back “causes”
without recognizing the implications of their actions.
“Best management practices” or “sound scientific
research” have been removed from the equation.

As with ethanol, pork producers are on the wrong
side of the political issue. Unless the industry takes a
proactive approach, it will always be on the defensive.
Research on new systems should be supported, but
moving to new systems must follow monitored trials
with group sizes comparable to real-life situations.

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Authority (TPA). With 96% of the world’s population
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The WTO has no authority and isn’t asking for
authority on how much we spend in the farm bill.
It’s not how much we spend, it’s how we spend it,”
continues Flinchbaugh bluntly. And while it would be
erasier to develop a domestic program without worrying
about the WTO, that’s impossible.

“When you export 27% of everything you produce,
it’s not very smart to discount the WTO,” states
Flinchbaugh.

DEVELOP YOUR PLAN
How do you remain among those who thrive?
The most effective tools you have for climbing to
the pinnacle are information, application of best
management practices and implementation of new
 technologies. Identifying challenges and developing
a plan to overcome them are among your best
defenses.
Benchmarking is an inevitable part of any production process. It can be done informally, through comparisons during conversations at meetings or other get-togethers. It can be done through retrospective comparisons, by asking producers to recall prior productivity levels. Finally, it can be done by taking the records and analyzing the data in a standardized method across farms.

The latter is the method used in this benchmarking report. The broad use of PigCHAMP recording on farms along with the wise decision, made many years ago, to benchmark based on the collection of actual production data has created an incomparable opportunity to compare and measure productivity on swine farms.

IDENTIFY TRENDS
In this database producers submit, on a quarterly basis, a backup of their production data, which is then used to create a quarterly report back to these producers to allow regular benchmarking. Such benchmarking can identify trends that deviate from expected productivity and can produce real opportunities for improvement. For reproductive records, quarterly comparisons are approximately the maximum frequency that is of use.

On a yearly basis, however, this database affords the opportunity to identify longer-term trends. In addition, the yearly review allows partners in production to recognize opportunities for improvement in the current herd. As always, there are illustrations that present opportunities, as well as the limitations of current productivity outcomes. Some are universal to the industry, and some are limited to underperforming farms. As you review these results, it is useful to keep a number of aspects in mind.

- This database summarizes performance across individuals sows or growing pig groups, and then summarizes on a farm-by-farm basis. This allows data validity steps to be taken to ensure utility. We test whether the sows’ productivity is recorded correctly and whether herds are stable and in production methods. This level of validation is often not seen in summary results in agriculture.
- Most of these comparisons are in the area of reproductive efficiencies. Reproduction benchmarking is often characterized by differences in capability to achieve high performance. That high performance is rarely tied to any single costly technology. In most cases, the variation that we see in reproductive productivity is not a strategic differentiation but simply an outcome of management. In other words, most farms are capable of reaching the higher levels of reproductive efficiencies seen in this database.

- We are seeing generalized trends in improvements in reproductive output, and we believe the long history of PigCHAMP benchmarking has contributed to these improvements. There are two ways of viewing causes of improvement. The first is to suggest that improvements in productivity have occurred in all farms. The second is to suggest that there is a “selection of the fittest” occurring, where only the best farms survive. Though the latter does occur, it appears that most improvement is occurring within farms.
- It is still surprising that there is such a large range of productivity. There are very few technological secrets or capabilities that are not available to all participants in the industry. Yet we must view opportunities for improvement as relatively difficult to attain. It is unlikely that there is one “silver bullet” that can be discerned from these benchmarks for a farm.

Of course, benchmarking productivity is not the only area for improvement. It is part of a set of tools and opportunities for progress within this industry. It is a relatively efficient method of analysis and it can allow us to prioritize and identify new opportunities.

Editor’s Note: Dr. John Deen is a veterinarian and associate professor at the College of Veterinary Medicine, University of Minnesota.
The Novus Pork Team offers a suite of innovative products to address the challenges of modern pork production. We deliver customer-centric solutions that help achieve nutrition and health goals. The Novus Pork Team utilizes performance through innovation in all aspects of business to deliver solutions that help improve and optimize gut health management.

For more information on Novus solutions for the swine industry, please email contact@novusporkteam.com or visit www.novusporkteam.com
2006 has brought another year of improved productivity and a continued wide range of performance across farms. This database takes the reports of the PigCHAMP family of record keeping systems and summarizes the results to allow benchmarking and characterization of the industry as a whole. Our endeavor is to allow producers to identify

A SUMMARY OF THE 2006 DATA
Productivity is higher, but range of performance is still wide.

By Sukumarannair S. Anil and John Deen

<table>
<thead>
<tr>
<th>Pigcare variables</th>
<th>PigCHAMP variables used</th>
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<th>SD</th>
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<td>Piglets weaned/female/year</td>
<td>Pigs wnd / female / year</td>
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<td>% sow deaths per year</td>
<td>Death rate (N=491)</td>
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<td>Ave female inv - Ave gilt pool inv</td>
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<td>1313.41</td>
<td>665.00</td>
<td>2748.00</td>
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</table>
As a whole, we continue to see many opportunities, particularly for those farms in the lower percentiles of specific productivity measures. As well, we see great opportunities to maintain productive sows in the herd for longer periods of time. Much more discussion has been placed on the quality of pigs at time of weaning, and management of parity structure is one of those opportunities. We see some movement in weaning age as well, with more herds having average weaning ages in excess of 20 days.

Pig farming will continue to have challenges, but the engine that provides the pig supply is the sow herd. Based on this, we should continue to see a relatively plentiful supply of pigs on the market.

| Summary Comparison Between PigCHAMP Care 3000 and PigCHAMP Farms included for summary: 488 |
|---------------------------------|---------------------------------|---------|---------|---------|---------|---------|
| Pigcare variables               | PigCHAMP variables used         | Mean    | SD      | Median  | Upper 10 percentile | Lower 10 percentile |
| Repeat services                 | Number repeat services          | 114.98  | 120.574 | 73.50   | 273.00             | 22.00               |
| % Repeat services               | Percent repeat services         | 15.92   | 36.740  | 12.50   | 25.50              | 5.80                |
| Total services                  | Total number of services        | 941.45  | 999.293 | 509.50  | 2052.00            | 208.00              |
| Farrowings                      | Number of sows farrowed         | 723.26  | 809.685 | 370.50  | 1676.00            | 142.00              |
| Farrowing rate                  | Farrowing rate                  | 74.09   | 11.818  | 76.85   | 86.20              | 58.10               |
| Total born                      | Total pigs born                 | 8702.58 | 9901.190| 4365.00 | 20513.00           | 1694.00             |
| Total born per litter           | Average total pigs per litter (N=487) | 11.91   | 0.822   | 11.99   | 12.91             | 10.80               |
| Total liveborn                  | Total pigs born alive           | 7866.09 | 9046.970| 3920.50 | 18210.00           | 1535.00             |
| Liveborn per litter             | Average pigs born alive/litter  | 10.70   | 0.916   | 10.78   | 11.69             | 9.70                |
| Liveborn/female/year            | litters/fem/yr * ave pigs born alive per litter | 22.80 | 3.855   | 23.22   | 27.10             | 17.92               |
| Total stillborn                 | Total stillborn pigs            | 649.08  | 697.578 | 368.50  | 1629.00            | 121.00              |
| Stillborn per litter            | Average stillborn pigs          | 0.96    | 0.326   | 0.96    | 1.34              | 0.59                |
| Total mummified                 | Total mummified pigs born       | 179.95  | 269.905 | 75.50   | 465.00             | 8.00                |
| Mummified per litter            | Average mummies per litter      | 0.22    | 0.184   | 0.20    | 0.40              | 0.03                |
| Sows weaned                     | Sows farrowed and weaned        | 698.93  | 797.833 | 355.50  | 1668.00            | 147.00              |
| Piglets weaned                  | Total pigs weaned               | 6895.23 | 7939.650| 3452.50 | 16082.00           | 1396.00             |
| Piglets weaned per litter       | Pigs weaned per litter weaned    | 9.30    | 0.935   | 9.40    | 10.20             | 8.41                |
| % Total losses of liveborn      | Pre-weaning mortality           | 12.42   | 4.385   | 12.19   | 17.76             | 7.37                |
| Average weaned weight           | Average litter weaning weight (N=144) | 120.04 | 31.974 | 123.00 | 148.00             | 97.00               |
| Piglets age at weaning          | Average age at weaning          | 19.43   | 2.317   | 19.60   | 21.40             | 17.10               |
| Piglets weaned/sow/year         | Pigs wnd / mated female / yr    | 20.98   | 3.500   | 21.38   | 24.75             | 16.90               |
| Piglets weaned/female/year      | Pigs wnfd / female / yr         | 19.85   | 3.568   | 20.38   | 23.80             | 15.60               |
| Total boars                     | Ending boar inventory           | 10.39   | 27.545  | 4.00    | 20.00             | 0.00                |
| Sows added                      | Females entered                 | 203.64  | 275.717 | 97.00   | 479.00             | 29.00               |
| Sows culled or sold             | Sows and giltis culled          | 171.07  | 223.059 | 94.50   | 368.00             | 32.00               |
| % Cull per year                 | Culling rate (N=481)            | 53.27   | 35.201  | 46.60   | 76.90             | 26.70               |
| Sows died                       | Sow and gilt deaths             | 29.71   | 47.656  | 14.00   | 71.00             | 3.00                |
| % sow deaths per year           | Death rate (N=481)              | 7.91    | 4.685   | 7.30    | 13.20             | 3.10                |
| Total sows                      | Ave female inv - Ave gilt pool inv | 1278.04 | 1358.840 | 703.10 | 2793.80 | 291.00 |
WIDE RANGE OF PERFORMANCE
The real question is not the average effect but the variation in effects.

By John Deen

One of the starkest characteristics of benchmarking productivity is the wide range of performance being seen across this industry. One of our favorite numbers is “pigs born alive per mated female per week.” It measures the output on a weekly basis as a function of the inventory of sows in the herd. “Mated females” is defined as including all females in the herd except for those gilts that have not yet been mated for the first time.

What strikes us is the wide range of performance. First of all, the average output is approximately .45 pigs born per sow per week. The average 95% range of pigs born per sow per week within a farm is from .26 to .64 pigs born alive. This range occurs in farms that are trying to stabilize output to utilize downstream facilities as efficiently as possible. Part of this variation is due to seasonal infertility, but much of it is due to variation in performance.

Interestingly, this variation in productivity is highest when productivity is lowest. Though the average standard deviation for the year is .09 pigs per sow per week, this varies over the year from .7 to .11. This suggests that there are increased opportunities for improvement when the herd is challenged.

The study of variation is really a study of capability. Where variation exists there is opportunity for improvement that should be readily available.

A case in point would be the variation in farrowing rates. The coefficient of variation in this indice is 14.1%. Compare this to the variation in total number of pigs born. That coefficient of variation is 6.2%. It suggests that there is greater opportunity for improvement in the farrowing rate. There are differences in genotype that affect the total number of pigs born and there are regional differences that affect this number as well. However, it is more difficult to pick up a pattern in the variation of farrowing rate, even though it is much larger. Nor are there a large number of undiscovered technologies that are not available to all producers. It does appear that the variation in total number of pigs born is explained by the differences in farrowing rate. There are differences in genotype that affect the total number of pigs born and there are regional differences that affect this number as well. However, there are more opportunities for improvement in the farrowing rate than there are in the variation of farrowing rate.

As producers look for benchmarks in which they have the greatest capability for improvement, they must look at not only the ranking of their farms compared to the rest of the population, they must also look at the breadth of variation within that ranking. Look for the greatest range of variation in productivity as it points you in the area where you have the greatest capabilities for change. Not only is it the greatest capability for change, but the answers are close at hand as other producers are capable and actually implementing a higher level of compliance to proper technique.
When battling respiratory challenges, it’s easy to think of sows and piglets as liabilities. But a sow herd is actually an asset—and keeping it healthy can help you maximize profits. Unfortunately, when producers wait until performance losses occur to respond to respiratory disease, assets can become true liabilities: deads, culls and lightweight pigs that drag down profits.

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Most people are shocked to see the range of variability that still exists in the industry today. Given the spread of achievement out there, it is safe to say there are lots of potential profits being left on the table. Having said that, there is also a perception among many that unless you have entered the top 25% in production metrics you have departed or soon will depart the industry. The truth of course is that there is no such place as Lake Woebegon, that mythical place invented by Garrison Keillor where, “all the women are strong, all the men are good-looking, and all the children are above average.” So, before we sport bumper stickers claiming our swine unit is on the honor roll, it is a good idea to understand the variation in performance we see in the metrics, and explain what it might mean for your operation.

Variation is normal

First, we know that variation in performance is a normal, predictable and permanent part of any biological system. It cannot be eliminated and it is a function of the response of living organisms to their environment and the changes in their environment. Not all variation has negative economic consequences. Geneticists are always hoping for variation so they can garner the very top end for future advancements. On the other hand, cash flow is often directly tied to production variance and therefore it can be problematic if it is out of control.

We experience biological production as a distribution of outcomes that can be described statistically by the average and some measure of dispersion around the average, such as the variance or standard deviation. The key to increased performance is to raise the average profitability while reducing its variance. We begin by talking about profits since there are hundreds of ways to affect profits in an organization. In many cases, the most important change you should make to affect profits is unique to your organization.

Not easy, but worth the effort

Increasing the average of a production metric while decreasing its variance is without question an uphill battle. The natural order will be to increase variance when the average is raised, and moving against the natural order of things requires vigilance, understanding and effort. One of the key understandings top producers bring to their management is that while nature deals us a system with built-in variation, the important thing is to keep from adding to the variation through sloppy management practices, poor technology or improper nutrition etc.

As you size up your performance with the benchmarking metrics provided, focus on the opportunity you may have been missing through past decisions you have made. In articles on the Farms.com website, I have focused on opportunity cost as a very valuable tool for opening insights into possible future improvements. As you scan the range of outcomes in the industry and compare it to your own, you may want to think about not only the metrics but the profit potential that has been left on the table due to the factors and choices that have resulted in your system performance today.

Net income is the goal

It is important to think about the cost of achieving gains in any of the metrics and the likely future payoff. I have been to countless producer meetings over that last two decades where plaques, prizes and other recognitions were given to producers on the basis of high achievement in one or more of the production metrics. An award I have never seen given is one for the farm that produced the highest net income or highest return on equity in total or per pig. Simply trying to maximize or minimize production metrics is a naïve approach to the future. Take a look at where you stand, analyze the cost and return associated with improving a key metric and make your move toward the one with the highest net payoff – not the highest bragging rights. Forget the plaque, go for the cash.

Editor’s Note: Dr. Dennis DiPietre is a swine industry consultant from Columbia, Missouri.
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There are various indices that can be used for benchmarking. Some of these are more appropriate for farm-to-farm benchmarking and some are more appropriate for internal benchmarking. The latter does not show up on these pages but can be important, nonetheless. One such example that is found in the PigCHAMP Performance Monitor is the indice entitled “proportion of sows bred by seven days.”

At first sight this is an odd indice, because the “seven days” sounds arbitrary or antiquated. The question may be, “Why it is not five days or eight days?” The answer derives itself from some time ago, when sows were weaned on all farms on a weekly basis. At that time it was a measure of being able to clean out the breeding pens for the next batch of weaned sows. With many farms now weaning twice a week, or even more frequently, this may seem like an outmoded indice. However, it does appear as an important measure even on farms that wean multiple times a week.

This indice continues to be important for two reasons. First, there is something special about a cutoff of seven days. The research is relatively old at this point, but it does appear that sows not bred within seven days, especially sows bred seven to 14 days after weaning, appear to have much lower levels of reproductive performance. It is unclear why this occurs, but it seems to be repeatable across many farms. One hypothesis is simply that sows are not monitored as closely after the first week and these matings are of a lower quality. This fact also seems to be supported by the increase in the number of single-mated sows.

The figure shows a strong seasonal trend in this measure as well. This affects the culling rate and the inventory of open sows. It also has a strong correlation with farrowing rate and litter size.

This indice is an excellent internal monitoring measure. It is not one that we normally compare from herd to herd and it is not included in our quarterly and annual reports. Yet, within the barn, it is easily seen when the sows accumulate and a rapid response can be made to address this problem.

The sows should be considered a specific monitorable population that can be benchmarked from week to week within the farm.
In general, the Canadian sow herd appears to be more productive than the American sow herd, and this mirrors what we've seen in the past. There is a higher number of pigs per sow per year in Canadian herds in this database, and each of the contributing variables is also higher. Particularly significant is the difference in farrowing rate and the number of nonproductive sow days per year.

Some have attributed this difference to climatic differences, though little evidence of such a major effect is actually seen. Some have argued that the contrast can be attributed to differing financial pressures, with a lower potential of profitability within the Canadian herd at this time. This seems like a logical premise.

Another reason that appears to be popular is that farms selling weaned pigs are more likely to maximize their output. This may be due in part to the fact that they do not have to stabilize their output to the same level as some swine units, and it may also be due to the fact that they can focus on a very narrow range of technologies for specialization in reproduction.

Canada has a large number of farms that specialize in raising and selling weaned pigs, and these appear to be the leaders in reproductive output.

Note: There were no significant differences in performance of Canadian herds across different quarters, except for average number of piglets born alive /litter. Bars with different letters indicate significant difference in performance of U.S. (lower case letters) and Canadian (upper case letters) herds across different quarters.
LACTATION FEED INTAKE IS CRITICAL
How much sows eat during lactation has a huge impact on health, pig growth and sow longevity.

By Sukumarannair S. Anil

Measures to improve longevity of breeding females have been accorded a high priority in swine breeding herds. Although a sow may be removed from the herd at any time during its reproductive cycle, from an epidemiological standpoint, lactation is a high risk event. A great deal of the challenge to longevity is related to inadequate feed consumption during lactation. The nutritional demand on sows during lactation – especially modern, highly prolific sows – may not be met even with ad libitum feeding.

The nutritional demand on lactating sows is further exacerbated in younger parity females as they have the additional requirement to support growth. Inadequate lactation feed intake may affect sow longevity both directly and indirectly. The direct effects may be associated with excessive depletion of body reserves to maintain lactation, while the indirect effects are mediated by conditions that impair breeding performance.

Studies have indicated that highly productive sows may have physical limitations in consuming the quantity of feed required to replenish the minerals secreted during a heavy lactation. This may make them more prone to conditions such as osteomalacia, which can lead to lameness and removal from the herd. Similarly, there is research evidence that vital reproductive performance indicators such as wean-to-estrus interval and embryo survival rate are adversely affected by a low level of feeding during lactation.

BALANCING ACT
Since reproductive efficiency is a prerequisite for retaining sows in the breeding herd, any factor leading to a compromise in the reproductive performance of the sow can impair sow longevity. Arguably, a shorter lactation length means less body weight loss and less exposure to higher nutrient demands in the short term. However, it also means that sows with short lactation periods farrow more litters in the same time frame and will have a greater metabolic demand. Epidemiological evidence has linked shorter lactation length with high risk of removal. When the length of lactation is short, the diet therefore must ensure that milk production demands are fulfilled and post-weaning breeding performance remains unaffected.

A glance at the literature on lactation feeding research reveals two interesting points. First, though inadequate lactation feed intake is linked to inefficient reproduction and consequent sow removals, only a few studies have evaluated the direct relationship between lactation feeding and sow longevity. Secondly, the most predominant dimension of lactation feed intake used in research has been the average quantity consumed during the entire lactation.

EXTREMES ON THE LOW END
Efforts to improve any production scenario must focus on the low extremes. Translating this to lactation feed intake, producers should focus on those sows consuming significantly lower quantities of feed during any lactation day. The scientific proposition that there are time points during lactation when the physiological mechanisms controlling reproduction, such as estrus after weaning, are more sensitive to reduction in feed intake supports this argument.

A recent study at the University of Minnesota analyzed the direct link between lactation feed intake and sow longevity. This research demonstrates that sows consuming < 3.5 kg of feed per day during the first two weeks of lactation had a higher likelihood of removal from the herd before the next parity. The likelihood of removal was the highest (odds ratio 2.36, confidence interval 1.311- 4.261) for sows that consumed no feed in any one day during the first two weeks of lactation compared to the rest of the population.

KEY FACTORS TO CONSIDER
Factors affecting lactation feed intake include parity, litter size, pregnancy weight gain, mean room temperature, particle size and digestibility of the feed, availability of ad libitum water, frequency of feeding and feeder design. All these parameters need to be properly addressed to ensure adequate lactation feed intake. It goes without saying, we cannot force a sow to eat if she does not want to eat, but we can always look for options to prevent that from happening in the first place. The strategies to achieve this may include early detection of signs of diseases and other painful conditions and providing an environment conducive to promote eating during lactation.

Editor’s Note: Dr. Sukumarannair S. Anil is a veterinarian and post-doctoral researcher at the College of Veterinary Medicine, University of Minnesota.
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