Factors Affecting Litters Per Sow Per Year (LSY)

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Pigs/Sow/Year remains one of the most common metrics used in the swine production industry to provide a measure of overall sow farm efficiency. PSY is the result of a rather simple calculation Litters/Sow/Year (LSY) multiplied by Pigs Weaned/Litter (PW/L). So, PSY is simply the product of asking, "how many litters do my sows have per year and how many pigs are in those litters"?

Obviously, the industry has made dramatic improvement in PSY over the years. When I first entered the industry many years ago, we gave people awards for achieving 19 PSY. Back then 30 PSY would have been nearly unthinkable. Now, for many farms, 30 PSY is the standard and many farms in mature markets are setting their targets even higher. In just the last few years, we've seen significant improvement in PSY. According to PigCHAMP Benchmarking records, in the US, from 2004 to 2017, PSY for the top 10% of farms improved from 23.1 to 28.65. Most of that improvement, however came from improving litter size. PW/L increased from 9.8 to 12.05 in the same time period but LSY only increased from 2.36 to 2.38.

So, the majority of the improvement in PSY came from litter size and relatively little from LSY. As we continue to work to improve PSY, litter size will certainly remain a focus. While a reasonable person might argue that we're beginning to push the limits of what we can/should expect from sows with respect to litter size, all indications are there is still significant upside potential for litter size for the foreseeable future. As we continue our quest for increased PSY, however, I think it will become increasingly important to put some focus on the other side of the equation and consider ways to improve LSY.

One of the obvious factors affecting LSY is the length of gestation and lactation. As gestation length and lactation length increase, potential litters per sow per year is reduced. One of the reasons for the relative lack of improvement in LSY is that over the last twenty years, gestation lengths and lactation lengths have both increased. We've learned that newer genetics typically result in gestation lengths of 115-117 days compared to the 114 days were accustomed to years ago. We've also discovered that systems are more productive when lactation lengths are extended. While early weaning strategies were popular in the 1990's, the 2000's saw producers looking for ways to increase their average weaning age.

The result is an average weaning age of 20.71 in the US last year compared to 18.23 in 2004. While those might sound like small numbers, the impact is quite significant. The combination of two additional days in gestation and 2 additional days means that the maximum possible LSY goes from 2.63 to 2.55.

Any changes to gestation length or lactation length by management intervention should be evaluated against the direct impact on LSY. As is often the case, this is a balancing act. For example, if we reduce the average lactation length by a few days, we can improve LSY (on paper at least) but research shows that shorter lactation lengths can result in longer wean to service intervals and smaller subsequent litters.

Assuming that we've selected the optimum gestation/lactation lengths, we can begin to look for other ways to improve LSY. In order to do this, we must understand the concept of a non-productive day. In short, a non-productive day is any day when a sow is not either gestating or lactating. The only "required" non-productive days are the 5-7 days between weaning and the sow's re-breading. Any other day that a sow spends neither lactating or gestating is a day that she is eating and taking up space but not producing. As an old manager of mine used to say, "she's getting a paycheck but she's not working."

So, where do these non-productive days come from? One of the most common is recycles. Farrowing rates have improved over the years and now the top farms are achieving around 92% farrowing rates consistently. While expecting 100% farrowing rates is not practical, any improvement in this area can contribute to reductions in non-productive days. If we find a sow was not successfully bred, that's a minimum of 21 non-productive days we have to add to our list. Second, we need to accurately and quickly identify recycles as to minimize the impact. If we have a sow that recycles, and we catch her at 21 days, we can minimize the damage and either re-breed her or cull her depending on the situation. If we don't realize she's not pregnant until we're ready to move her to the farrowing house, that's a disaster, a lot of non-productive days. It is imperative that we have heat checking and pregnancy detection systems in place that help us minimize the number of non-productive days.

Another common contributor to non-productive days is "late weaners" sow that are not bred within 7 days of weaning. There are many potential causes for these late weaners but likely the most common is improper lactation feeding. It is well established that sows that don't eat well in lactation tend to have longer wean to service intervals so it's imperative that sows both enter the lactation barn in good condition and have high lactation feed intakes.

Culling efficiency is another factor to consider when looking for ways to reduce non-productive days. Culling efficiency is simply a measurement of the delay between the decision to cull a sow and her actually leaving the farm. Once you've made a decision to cull a sow, whether that's after weaning, after a failed attempt to breed, or after another even, the time it takes to actually remove her from the farm counts as non-productive days. While it's likely impractical to remove cull sows every day, increasing the frequency and or strategically targeting those shipping days can help reduce non-productive days.

So, how important are non-productive days? I often call them the silent killer because it's fairly easy to ignore them. They can have a dramatic impact on the profitability of a sow farm, however, and we need to attach a value to understand their significance. Swine Veterinarian Blaine Tully gives us a few very useful formulas related to non-productive days. The first is the cost of a non-productive day based on cost of production. The formula goes like this:

Weaned Pig COP X PSY / 365 days in a year = Cost of One Non-Productive Day

Example: $40 COP X 27 PSY / 365 = $2.96/Day

Another useful formula from Dr. Tully is the value of a non-productive day calculated through LSY. In this formula, we're working under the simple assumption that a non-productive day is a potential productive day and that one non-productive day results in a reduction of .0074 LSY. Therefore, the formula goes like this:

.0074 LSY X Pigs Weaned/Litter X Market Value of a Weaned Pig = Opportunity Loss from one NPD

Example: .0074 X 11.2 X $50 = $4.14 / Non Productive Day (NPD)

So, if we use the previous formula and compare two farms of the same size (2500 sows) and one is doing 32 NPDs per sow and the other is doing 70 NPDs per sow, the higher performing farm is saving $281,200/year. I think a quarter of a million dollars in opportunity is enough to get almost anyone's attention.

So, as you're evaluating your sow performance and opportunities for improvement, don't forget that the PSY formula has another side…LSY.

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