Litter Size Relative to Functional Teat Count on Lactating Sow and Litter Performance

Authors: Abigail K. Jenkins[1], Sierra M. Collier[1], Joel M. DeRouchey[1], Mike D. Tokach[1], Jason C. Woodworth[1], Katelyn N. Gaffield[1], Jordan T. Gebhardt[1], Robert D. Goodband[1], Kyle F. Coble[2], Paul J. Corns[2], Jimmy Karl[2], Tag Bradley[2], Erick Barerra[2], and Mitzi Arellanes[2]

[1]Kansas State University, [2]JBS Live Pork

TAKE HOME MESSAGE:

1. The optimal litter size relative to functional teat count is dependent on the criteria of interest
2. If optimizing individual performance for the lowest pre-weaning mortality, lowest sow body condition loss, and highest piglet weaning weight is desired, then minimizing litter size relative to functional teat count is the best option
3. However, if maximizing farm throughput for the highest pigs weaned/litter, highest litter weaning weight, and highest pigs weaned/sow/year is desired, then nursing more pigs than functional teats is the best option

What is a functional teat and why is it important?

A functional teat is one that produces enough milk to sustain the life of a pig (Alexopoulos et al., 2018), is elongated and pointed with no visual defects, and can be suckled by the pig (Arend et al., 2023). Therefore, any blunt teats, blind teats, or teats connected to mammary glands with severe edema are considered non-functional. Functional teat count should be determined after farrowing occurs to give more certainty in the number of functional teats a sow possesses (Alexopoulos et al., 2018). Recent benchmarking reports for United States swine production systems have reported that the top 10% of farms are achieving an average liveborn per litter of 15.7 pigs (PigChamp, 2024). However, recent research has shown that sows in some commercial swine herds have average functional teat counts of 13.9 (Obermier et al., 2023). This imbalance in liveborn pigs and functional teat count requires alternative rearing strategies such as artificial rearing, fostering extra pigs onto nurse sows, or allowing sows to nurse more pigs than they have functional teats.

What are the potential drawbacks of alternative rearing strategies?

Artificial-rearing systems involve housing piglets in specialized enclosures that provide warmth, milk replacer, and solid feed, allowing them to be removed from the sow between 2 and 14 days of age (Baxter et al., 2013). While these systems can help manage surplus piglets, they have been associated with increased piglet lesion scores (Schmitt et al., 2019), impaired immune function (Han et al., 2024), and inconsistent effects on growth performance (Vergauwen et al., 2017). Alternatively, a nurse sow is a sow whose own litter has been weaned or removed and is then replaced with a new litter of pigs (Alexopoulos et al., 2018). Utilizing nurse sows can reduce overall farm productivity due to lower milk yield (Kobek-Kjeldager et al., 2020), greater culling rates (Osotsi et al., 2024), and increased biosecurity risks by disrupting the all-in/all-out system and facilitating disease spread (Garrido-Mantilla et al., 2020). In addition, nurse sow use can interfere with breeding targets, as it requires keeping empty farrowing crates available for their transfer (Osotsi et al., 2024). If we have a hyper-prolific female but want to limit nurse sow and artificial rearing system usage, we must consider the impact of nursing more pigs than functional teats.

Recent evaluation of litter size relative to functional teats

Researchers at Kansas State University recently completed a large commercial study in partnership with JBS Live Pork (Jenkins et al., 2025). A total of 1,005 sows (average parity 3.5, PIC Line 1050) and their litters (15,278 piglets) were utilized to determine the impact of litter size relative to functional teat count on sow lactation measurements, litter performance, and subsequent reproductive performance under commercial conditions. Sows were allocated piglets according to 4 treatments: one less pig than functional teats (-1), the same number of pigs as functional teats (0), one more pig than functional teats (+1), or two more pigs than functional teats (+2). Measurements of sow body condition (body weight, backfat depth, and caliper score) were collected at the time of farrowing house loading (d 112 of gestation) and at weaning (22 days after farrowing). After each sow completed farrowing, she was randomly assigned to one of the treatments such that functional teat count, parity, and sow body condition were equalized across all treatments. Any pigs born weighing less than 2 lb were not included in this study and were cross-fostered into litters receiving specialized care as per the normal standard operating procedure of this farm. To attain the correct number of pigs relative to functional teat count, average birth weight pigs were cross-fostered in order to maintain the normal body weight variation within the litter and to keep the average piglet starting weight across all 4 treatments the same (3.4 lb). Pigs were individually weighed after cross-fostering was complete for that litter and on the day prior to weaning. No supplemental nutrition (creep or milk) was provided to any of the litters in this study. Starting at d 3 of lactation, fall-behind pigs were identified and removed from the farrowing crate. Fall-behind pigs were any pigs identified as being gaunt in appearance with evidence of ribs and backbone becoming visible and empty bellies. Removals and mortalities were not replaced in the litter.

What did we learn?

The study showed that removals and mortality increased as litter size relative to functional teat count increased, but this occurred at a diminishing rate. Even though removals and mortality rose, litter size at weaning still increased, from 12 pigs in -1 sows to 13.5 pigs in +2 sows. As expected, piglet average daily gain and weaning weight decreased with larger litters, but all treatments still weaned pigs heavier than 13.5 lb on average (Figure 1). Although -1 sows weaned heavier individual pigs, the smaller litter size could not compensate for the weight difference, resulting in greater total litter weaning weights in larger litters. Sows with larger starting litters also weaned closer to or above their functional teat count more frequently, with nearly half of +2 sows fully utilizing all teats throughout lactation.

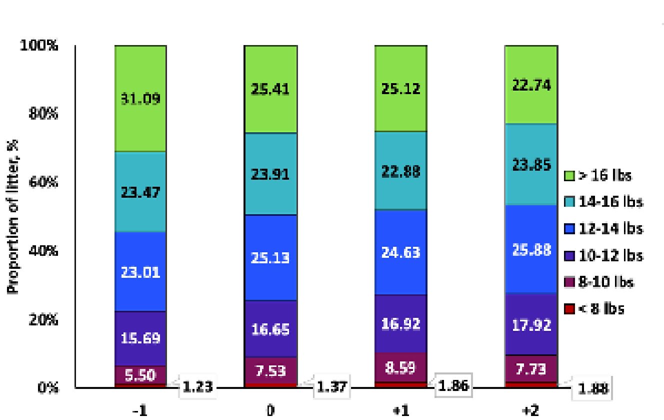

Figure 1. Effect of pigs placed relative to teat count on the proportion of the litter weaned in each BW category (Jenkins et al. 2025).

Sow body condition losses during lactation increased with more pigs nursing relative to teat count, but differences between treatments were relatively small. Importantly, these increased losses did not negatively impact subsequent performance. Across treatments, the percentage of sows bred by day 7 was similar, culling rates were unchanged, and subsequent farrowing rates were maintained. Surprisingly, +2 sows even had a shorter wean-to-estrus interval and tended to have more total born and liveborn pigs in the next litter compared to sows nursing smaller litters. Overall, pigs weaned per sow per year increased as litter size relative to functional teat count increased (Figure 2). Removals and mortalities were not replaced in the litter.

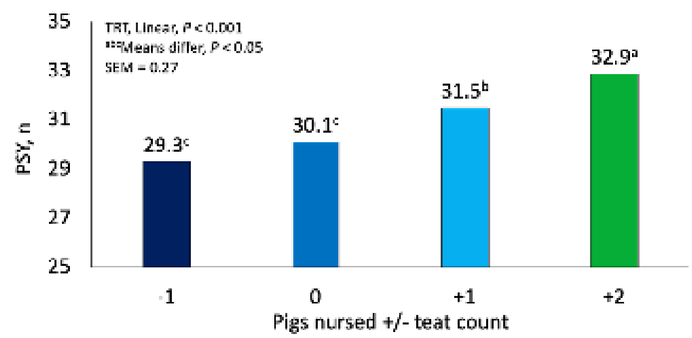

Figure 2. Effect of pigs placed relative to teat count on the proportion of the litter weaned in each BW category (Jenkins et al. 2025).

Keys to success with nursing more pigs than functional teats:

1. Good sow body condition. The farm in which this study was conducted averaged 15 mm of backfat and less than 10% of sows classified as thin when utilizing the PIC caliper at entry into the farrowing house. Sows that enter lactation in better condition are more resilient and better equipped to nurse larger litter sizes.
2. Teamwork. Implementation will require everyone in the farrowing room to be clear on the new SOP and why these changes are important.
3. Proactiveness. Loading more pigs than functional teats requires the farrowing team to be cognizant of a sow's limitations. Not every sow can be a +2 sow. Fall behind pigs need to be removed early in order to maximize chance of survival and weaning at full value. Thus, nurse sows are still required, just fewer than when loading sows with fewer pigs.

REVIEWERS: Jason Woodworth, Jordan Gebhardt, Mike Tokach, and Joel DeRouchey, Kansas State University

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