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# The Effect of Litter Size Relative to Functional Teat Count on Lactating Sow and Litter Performance

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# The Effect of Litter Size Relative to Functional Teat Count on Lactating Sow and Litter Performance


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# The Effect of Litter Size Relative to Functional Teat Count on Lactating Sow and Litter Performance

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## Summary

A total of 1,005 mixed-parity sows (Line 1050, PIC) and their litters were used to evaluate the effect of litter size relative to functional teat count on lactating sow and litter performance. Sows were blocked by parity category (P1, P2-P4, and P5+) and functional teat count determined at the time of farrowing and then allotted to one of four treatments. There were 251 or 252 sows per treatment. Treatments consisted of one fewer piglet 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). Cross-fostering occurred within 24 h of farrowing. Pigs were individually weighed after cross-fostering and the afternoon before weaning. All pigs born weighing less than 2 lb were cross-fostered onto sows that were not included in this study. Sow body weight (BW), caliper score, and backfat measurements were collected at the time of entry (approximately d 112 of gestation) and weaning. Parity category, treatment, and their interaction, as well as teat category (≤ 13, 14-15, and ≥ 16 teats) were included in the model as fixed effects. Any fall-behind piglets, agreed upon by research and farm staff, were recorded and removed from the sow, and no replacement piglet was added to that litter. As litter size relative to functional teat count increased, sows lost more weight and caliper units (linear, $P \leq 0.005$). However, the sow culling rate due to failure to conceive decreased (linear, $P = 0.038$). Litter size and litter weight increased (linear, $P < 0.001$) as litter size relative to functional teat count increased at both d 2 and weaning. However, litter ADG was greatest for -1 and +2 sows compared to 0 and +1 sows (quadratic, $P = 0.045$). Mean piglet BW at weaning (linear, $P < 0.001$) and piglet ADG decreased (quadratic, $P = 0.042$) as litter size relative to functional teat count increased. On-test (d 2 to wean) removals and mortality increased (linear, $P < 0.001$) as litter size relative to functional teat count increased. Wean-to-estrus interval was longer for sows with the same number of pigs as functional teats ($P < 0.05$) compared to +2 sows with -1 and +1 sows intermediate. Even though piglet removals and mortality were greater as the number of pigs relative to teat count increased, pigs weaned per

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sow per year (PSY) increased as litter size relative to functional teat count increased (linear, $P < 0.001$). In conclusion, the optimal litter size relative to teat count is dependent on criteria selected. To achieve the lowest piglet mortality and sow BW loss, and highest piglet weaning weight, sows should have one less pig than functional teats after cross-fostering. However, for the highest number of pigs weaned per litter and PSY, sows should have two more pigs than functional teats after cross-fostering.

## Introduction

The modern hyper-prolific sow of today often gives birth to more piglets than the number of functional teats that she possesses. For this reason, strategies such as nurse-sows and cross-fostering piglets are used. However, the best loading strategy relative to the number of functional teats to optimize litter weaning weight and minimize preweaning mortality is not clear. One study investigating the impact of litter size relative to functional teats across parities observed that pre-weaning mortality decreased from 17.9 to 7.7% and sows tended to wean heavier piglets when sows were nursing two piglets fewer than functional teats compared to sows nursing two piglets more than functional teats, with sows that had the same number of piglets as functional teats intermediate.[3] In another study, sows that nursed one more pig than their functional teat count weaned 0.67 more pigs.[4] Although mortality rates were similar, their piglet removal rate was higher compared to sows nursing a number equal to their functional teat count.[4] The present research is the first to combine a wide range of piglet-to-teat ratios with a large sample size. Therefore, the objective of this study was to determine the effects of litter size relative to functional teat count on sow lactation measurements, litter performance, and subsequent reproductive performance in commercial conditions.

## Materials and Methods

The protocol for this experiment was approved by the Kansas State University Institutional Animal Care and Use Committee. This study was conducted at a commercial sow farm in northwest Texas (JBS Live Pork, Dalhart, Texas). Sows were individually housed in farrowing stalls equipped with a SowMax *ad libitum* sow feed hopper (HogSlat, Newton Grove, NC) with a nipple waterer. Sows were allowed *ad libitum* access to a common sorghum-soybean meal-based lactation diet formulated to 1.05% SID Lys throughout the duration of the study. Creep feed and supplemental milk were not offered throughout this trial.

### *Animals*

A total of 1,005 sows (average parity 3.5, Line 1050, PIC, Hendersonville, TN) and their litters were used from June to August 2024. On approximately d 112 of gestation, sows were moved into the farrowing house. Sows were blocked by parity and functional teat count and allotted to one of four treatments after the completion of farrowing. Treatments were designed relative to functional teat count and consisted of the following: one less pig than functional teat count (-1), the same number of pigs as

[3] Vande Pol, K. D., R. O. Bautista, A. Olivo, H. Harper, C. M. Shull, C. B. Brown, and M. Ellis. 2021. Effect of rearing cross-fostered piglets in litters of differing size relative to sow functional teat number on preweaning growth and mortality. Transl. Anim. Sci. 5:txab193. doi:*10.1093/tas/txab193*.

[4] Zanin, G. P., L. Santos, D. M. S. Tomm, D. F. Silveira, F. P. Bortolozzo, R. R. Ulguim, and A. P. G. Mellagi. 2024. Sow and litter performance after cross-fostering one surplus piglet and co-mingling the litters at early lactation. Animal. 101247. doi:*10.1016/j.animal.2024.101247*.

functional teat count (0), one more pig than functional teat count (+1), or two more pigs than functional teat count (+2). Cross-fostering was performed within 24 h after the completion of farrowing. Pigs that were born weighing less than 2 lb were cross-fostered onto sows that were not included in this study. To attain the correct number of pigs relative to functional teat count, average birthweight piglets were utilized for cross-fostering to maintain the normal body weight variation within the litter. Functional teat count and cross-fostering was performed by the same individual for all litters throughout the duration of the study.

Sow body weight (BW) was measured on d 112 of gestation and at weaning. Body weight loss after farrowing was modeled using the equations developed by Estrada et al. (2024):[5]

> Sow body weight after farrowing = pre-farrow adjusted weight – conceptus weight. Pre-farrow adjusted weight = total pigs born × 0.039 × days until farrowing from time of weighing + pre-farrow weight. Conceptus weight = 0.137 + 1.329 × total pigs born × average pig birth weight.

Sow backfat depth was measured on d 112 of gestation and at weaning at the last rib, two inches from the midline (Renco Lean Meter, S.E.C. Repro Inc., Golden Valley, MN). Sow caliper score was measured on d 112 of gestation and at weaning, at the last rib. Piglets were individually weighed following cross-fostering and the day prior to weaning. Beginning on d 3 of lactation, piglets that were gaunt in appearance were removed as fall-behind pigs. These piglets were only removed if the removal was agreed upon by research and farm staff. All pigs removed and all mortalities were weighed and recorded. No replacement pig was added to the litter in the incidence of a removal or mortality. At the time of weaning, piglets were classified into the following pre-determined BW categories: < 8 lb, 8-10 lb, 10-12 lb, 12-14 lb, 14-16 lb, and > 16 lb to determine the proportion of pigs in the litter that fell within each BW category. In addition, the litter coefficient of variation (CV) was determined on d 2 and at weaning by dividing the standard deviation of pig weights within the litter by the average weight of pigs for that litter.

### *Statistical analysis*

Performance data were analyzed using the lme4 package of R (Version 4.0.0, R Foundation for Statistical Computing, Vienna, Austria) as a randomized complete block design. Blocking structure accounted for parity and functional teat count. Parity categories were: first parity (n = 206), parities 2 through 4 (n = 487), and parity 5 and above (n = 312). Functional teat count categories were: 13 or less (n = 163), 14 to 15 (n = 549), and greater than 16 (n = 293). Within each block, sows were randomly assigned to treatment after farrowing was completed to equalize parity, functional teat count, and wean age. Sow served as the experimental unit. Treatment, parity category, and their interaction were included as fixed effects. Functional teat count was also included in the model as a fixed effect. Backfat at entry was included in the model as a covariate in the analysis of backfat at weaning and backfat change over lactation. Count data, including litter size on d 2 and at weaning and subsequent litter characteristics

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[5] Estrada, J., D. C. Johnson, K. L. Kyle, J. Perez, E. Parr, M. W. Welch, C. Neill, B. A. Peterson, and D. D. Boler. 2024. Characterizing sow feed intake during lactation to explain litter and subsequent farrowing performance. J. Anim. Sci. 102:skae093. doi:*10.1093/jas/skae093*.

(total born, liveborn, stillborn, mummies, and weaned) were analyzed using a negative binomial distribution using a log link function. Proportion data, including pre-weaning mortality and removals, were analyzed using a binomial distribution using a logit link function. Percentage of sows bred by d 7 post weaning, percentage culled, and subsequent farrowing rate were analyzed using a binary distribution. Differences were considered significant at $P \leq 0.05$ and marginally significant at $0.05 < P \leq 0.10$. All treatment × parity interactions were $P > 0.05$ unless otherwise indicated.

## Results and Discussion

There was a treatment × parity interaction ($P = 0.022$) for backfat at entry where sow backfat was numerically higher in +2 sows for parity 1 sows, whereas backfat was numerically greater in -1 sows in parity 2-4 sows, and numerically greater in +1 sows in parity 5+ sows (Table 1).

Sow BW did not differ based on litter size relative to functional teat count at entry or post-farrowing. However, there was a tendency for a decrease in sow BW at weaning (linear, $P = 0.080$) as litter size relative to functional teat count increased. Sow BW change from post-farrowing to weaning and from entry to weaning increased (linear, $P \leq 0.006$) as litter size relative to functional teat count increased. Sow backfat at weaning decreased (linear, $P = 0.046$) as litter size relative to functional teat count increased. Sow caliper score was lower at weaning (linear, $P = 0.055$), reflecting more caliper score loss over lactation (linear, $P = 0.001$) as litter size relative to functional teat count increased, similar to the change in backfat depth.

Litter size on d 2 and weaning increased (linear, $P < 0.001$) as litter size relative to functional teat count increased, where +2 sows weaned more pigs than 0 and -1 sows, with +1 sows being intermediate (Table 2). The percentage of pigs weaned relative to functional teat count increased (linear, $P < 0.001$) as litter size relative to functional teat count increased. Figure 1 shows the proportion of litters in each treatment that weaned at different pig counts relative to functional teat count. Notably, 47% of the -1 sows weaned three or more pigs below their teat count. As the initial litter size increases relative to teat count, the proportion of sows weaning three pigs below teat count or worse decreases, dropping to just 15% of +2 sows. In contrast, 48% of +2 sows weaned at or above their teat count. This percentage declines as starting litter size decreases, with no -1 sows weaning at or above teat count since none in this group began with a litter size matching their teat count. Litter weight on d 2 and weaning increased (linear, $P < 0.001$) as litter size relative to functional teat count increased, where +2 sows weaned heavier litters than 0 and -1 sows, with +1 sows intermediate. While there were no differences in litter weight change as litter size relative to functional teat count increased, there was a quadratic relationship ($P = 0.045$) between litter size relative to functional teat count and litter ADG, where -1 and +2 sows exhibited a numeric increase in litter ADG compared to 0 and +1 sows. There was no difference in mean piglet BW on d 2; however, mean piglet BW at weaning decreased (linear, $P < 0.001$) as litter size relative to functional teat count increased, where -1 sows weaned heavier pigs than +1 and +2 sows, with 0 sows intermediate. This decrease in piglet weaning weight was driven by a decrease (linear, $P < 0.001$) in piglet ADG as litter size relative to functional teat count increased. Pigs from -1 sows had the highest ADG.

Litter coefficient of variation did not differ on d 2 or at weaning, as litter size increased relative to functional teat count. The proportion of the litter weaned in pre-determined BW categories can be found in Figure 2. For -1 sows, there was a numerically lower percentage of smaller pigs (< 10 lb) at weaning and a greater proportion of pigs weaned > 16 lb compared to other treatments. However, between the other three treatments, the proportion of pigs in the litter weaned within each BW category was relatively similar. Percentage of removals increased (quadratic, $P < 0.001$) as litter size relative to functional teat count increased, with -1 sows having a lower percentage of removals than other sows. Percentage of piglet mortality increased (linear, $P < 0.001$) as litter size relative to functional teat count increased, where -1 sows had a lower percentage of mortalities than +1 or +2 sows, with 0 sows intermediate ($P < 0.05$). The combined percentage of piglet removals and mortalities increased (linear, $P < 0.001$) as litter size relative to functional teat count increased, with -1 sows having a lower percentage of removals and mortalities than other sows. The percentage of litters with no piglet removals or mortalities decreased (linear, $P < 0.001$) as litter size relative to functional teat count increased. The -1 sows had a higher percentage of litters with no removals or mortalities when compared to +1 or +2 sows, with 0 sows being intermediate ($P < 0.05$).

Litter size relative to functional teat count had a quadratic effect ($P = 0.049$) on wean-to-estrus interval (WEI), where +2 sows had a shorter WEI compared to 0 females with -1 and +1 females intermediate (Table 3). However, the percentage of females bred by d 7 post-weaning and subsequent farrowing rate did not differ based on litter size relative to functional teat count. The percentage of sows culled for any reason did not differ based on litter size relative to functional teat count. However, the percentage of sows culled due to failure to conceive decreased (linear, $P = 0.038$) as litter size relative to functional teat count increased. Subsequent total born tended to increase (linear, $P = 0.061$) and subsequent liveborn pigs increased (linear, $P = 0.017$) as litter size relative to functional teat count increased. Subsequent stillborn pigs, mummies, and number weaned did not differ based on litter size relative to functional teat count. Estimated pigs weaned per sow per year increased (linear, $P < 0.001$) as litter size relative to functional teat count increased, with +2 sows having the highest PSY, followed by +1 sows, which were followed by 0 and -1 sows ($P < 0.05$).

Parity 5+ sows were heavier at entry, post-farrow, and weaning and lost less BW after farrowing to weaning and from entry to weaning ($P < 0.05$) compared to parity 2 to 4 sows and parity 1 sows. Parity 2-4 sows were heavier at entry, after farrowing, and at weaning ($P < 0.05$) compared to parity 1 sows. Parity 5+ sows had more backfat at entry ($P < 0.05$) compared to parity 1 sows, with parity 2-4 sows intermediate. Parity 5+ sows had more backfat and a higher caliper score at weaning and lost less backfat and fewer caliper units ($P < 0.05$) compared to parity 2-4 and parity 1 sows. Parity 2-4 sows had more backfat and higher caliper scores and lost fewer caliper units over lactation ($P < 0.05$) compared to parity 1 sows. There was a numeric increase in the percentage of females culled due to any reason in parity 5+ sows compared to parity 2-4 sows and parity 1 sows. Estimated PSY was higher ($P < 0.05$) for parity 1 and parity 2-4 sows than parity 5+ sows.

Litter weight on d 2, litter and piglet ADG, and mean piglet BW on d 2 and weaning were decreased in parity 1 sows ($P < 0.05$) compared to parity 2-4 sows and parity

5+ sows. Litter weight at weaning was highest in parity 2-4 sows ($P < 0.05$) followed by parity 5+ sows and then by parity 1 sows. Parity 2-4 sows had increased litter weight change from d 2 to weaning ($P < 0.05$) compared to parity 1 and parity 5+ sows. Percentage of piglet mortality and percentage of combined piglet removals and mortality were increased in parity 5+ sows ($P < 0.05$) compared to parity 1 and parity 2-4 sows.

In conclusion, the optimal litter size relative to functional teat count is dependent on the response that is of greatest interest. For the lowest piglet mortality and sow BW loss and highest piglet weaning weight, sows should have one less pig than functional teats after cross-fostering. However, for the highest number of pigs weaned per litter, PSY and liveborn on the subsequent litter, sows should have two more pigs than functional teats after cross-fostering.

## Acknowledgements

Appreciation is expressed to JBS Live Pork (Greeley, CO) for partial financial support. We would like to thank the farm staff at the JBS Longview 100 farm (Dalhart, TX) for help with animal care and data collection. This project was supported wholly or in part by funding from The National Pork Board and the Foundation for Food and Agriculture Research.

**Table 1. Effect of litter size relative to functional teat count on sow lactation performance[1]**

| | Litter size +/- functional teat count[2] | | | | | P = | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Treatment | | |
| Item | -1 | 0 | +1 | +2 | SEM | Linear | Quadratic | Parity |
| Count, n | 251 | 252 | 251 | 251 | --- | --- | --- | --- |
| Sow BW, lb | | | | | | | | |
| Entry | 606.8 | 605.0 | 606.8 | 605.6 | 4.32 | 0.921 | 0.943 | < 0.001 |
| Post-farrow[3] | 540.0 | 539.8 | 541.2 | 540.6 | 4.28 | 0.868 | 0.966 | < 0.001 |
| Weaning | 525.1 | 526.0 | 519.0 | 517.6 | 3.92 | 0.080 | 0.749 | < 0.001 |
| On-test change (post-farrow to weaning) | -14.9 | -13.8 | -22.1 | -23.0 | 2.70 | 0.005 | 0.694 | < 0.001 |
| Lactation change (entry to weaning) | -80.5 | -79.0 | -87.8 | -88.4 | 2.74 | 0.006 | 0.686 | < 0.001 |
| Sow backfat, mm | | | | | | | | |
| Entry[4] | 15.0 | 15.0 | 15.1 | 15.1 | 0.24 | 0.695 | 0.864 | 0.022 |
| Weaning[5] | 12.1 | 12.2 | 12.1 | 11.8 | 0.14 | 0.046 | 0.166 | < 0.001 |
| Lactation change (entry to weaning)[5] | -3.0 | -2.9 | -3.1 | -3.4 | 0.14 | 0.046 | 0.166 | < 0.001 |
| Sow caliper score | | | | | | | | |
| Entry | 15.3 | 15.5 | 15.4 | 15.5 | 0.14 | 0.365 | 0.950 | 0.026 |
| Weaning | 13.1 | 13.2 | 12.9 | 12.7 | 0.16 | 0.055 | 0.254 | < 0.001 |
| Lactation change (entry to weaning) | -2.3[a] | -2.3[a] | -2.5[ab] | -2.8[b] | 0.14 | 0.001 | 0.197 | < 0.001 |

[a-b] Means within row with different superscripts differ ($P < 0.05$).

[1]A total of 1,005 mixed-parity sows (PIC, Line 1050) and litters were used from the time of cross-fostering (approximately 24 h after farrowing) until weaning. Treatment and parity category and their interaction were used as fixed effects in the statistical model. Teat-count category was included as a fixed effect in the model.

[2]Sows were allotted to treatment at approximately 24 h after farrowing. Sows were blocked by functional teat count and parity categories and assigned to one of four treatments: one less pig than functional teat count (-1), the same number of pigs as functional teat count (0), one more pig than functional teat count (+1), or two more pigs than functional teat count (+2).

[3]Body weight loss from entry to post-farrow was modeled utilizing the equations developed by Estrada et al. (2024):
Sow body weight after farrowing = pre-farrow adjusted weight - conceptus weight.
Pre-farrow adjusted weight = total pigs born × 0.039 × days until farrowing from time of weighing + pre-farrow weight.
Conceptus weight = 0.137 + 1.329 × total pigs born × average pig birth weight.

[4]Treatment × parity, $P = 0.022$.

[5]Entry backfat included in statistical model as a covariate.

**Table 2. Effect of litter size relative to functional teat count on litter lactation performance[1]**

| Item | Litter size +/- functional teat count[2] | | | | SEM | *P* = | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Treatment | | |
| | -1 | 0 | +1 | +2 | | Linear | Quadratic | Parity |
| Litter size, n | | | | | | | | |
| d 2 | 13.5[c] | 14.4[b] | 15.3[b] | 16.3[a] | 0.28 | < 0.001 | 0.914 | 0.900 |
| Weaning | 12.0[c] | 12.3[bc] | 12.9[ab] | 13.5[a] | 0.25 | < 0.001 | 0.685 | 0.197 |
| Pigs weaned relative to functional teat count, % | 83.1[d] | 85.8[c] | 90.1[b] | 94.5[a] | 0.75 | < 0.001 | 0.227 | < 0.001 |
| Litter weight, lb | | | | | | | | |
| d 2 | 45.9[d] | 48.7[c] | 51.8[b] | 54.8[a] | 0.55 | < 0.001 | 0.776 | < 0.001 |
| Weaning | 172.1[b] | 172.3[b] | 178.1[ab] | 183.6[a] | 2.34 | < 0.001 | 0.227 | < 0.001 |
| Change (d 2 to weaning) | 126.1 | 123.6 | 126.3 | 128.8 | 2.20 | 0.257 | 0.224 | < 0.001 |
| Litter ADG, lb | 6.12 | 5.89 | 6.03 | 6.14 | 0.093 | 0.583 | 0.045 | < 0.001 |
| Mean piglet BW, lb | | | | | | | | |
| d 2 | 3.40 | 3.38 | 3.38 | 3.37 | 0.035 | 0.417 | 0.850 | < 0.001 |
| Weaning | 14.35[a] | 13.99[ab] | 13.83[b] | 13.61[b] | 0.140 | < 0.001 | 0.582 | < 0.001 |
| Piglet ADG, lb | 0.51[a] | 0.47[b] | 0.47[bc] | 0.45[c] | 0.005 | < 0.001 | 0.042 | < 0.001 |
| Litter coefficient of variation, % | | | | | | | | |
| d 2 | 14.5 | 14.9 | 15.0 | 14.7 | 1.37 | 0.903 | 0.775 | 0.985 |
| Weaning | 15.5 | 16.1 | 15.5 | 15.3 | 0.69 | 0.654 | 0.550 | 0.866 |
| On-test piglet removals and mortalities, % | | | | | | | | |
| Removals | 7.6[b] | 9.9[a] | 10.4[a] | 10.6[a] | 0.55 | < 0.001 | 0.025 | 0.105 |
| Mortality | 3.4[c] | 4.3[bc] | 5.1[b] | 6.5[a] | 0.43 | < 0.001 | 0.903 | 0.003 |
| Removals and mortality | 11.1[c] | 14.2[b] | 15.7[ab] | 17.2[a] | 0.65 | < 0.001 | 0.086 | < 0.001 |
| Litters with no removals or mortality | 21.8[a] | 13.0[ab] | 5.6[bc] | 5.2[c] | 3.17 | < 0.001 | 0.316 | 0.031 |

[a-c]Means within row with different superscripts differ ($P < 0.05$).

[1]A total of 1,005 mixed-parity sows (PIC, Line 1050) and litters were used from the time of cross-fostering (approximately 24 h after farrowing) until weaning. Treatment and parity category and their interaction were used as fixed effects in the statistical model. Teat-count category was included as a fixed effect in the model.

[2]Sows were allotted to treatment at approximately 24 h after farrowing. Sows were blocked by functional teat count and parity categories and assigned to one of four treatments: one less pig than functional teat count (-1), the same number of pigs as functional teat count (0), one more pig than functional teat count (+1), or two more pigs than functional teat count (+2).

**Table 3. Effect of litter size relative to functional teat count on sow subsequent performance[1]**

| | Litter size +/- functional teat count[2] | | | | | *P* = | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Treatment | | |
| **Item** | **-1** | **0** | **+1** | **+2** | **SEM** | **Linear** | **Quadratic** | **Parity** |
| Wean to estrus interval, d | 5.1[ab] | 5.6[a] | 5.1[ab] | 5.0[b] | 0.17 | 0.211 | 0.049 | 0.105 |
| Bred by d 7 post wean, % | 86.9 | 83.9 | 89.1 | 90.3 | 2.79 | 0.191 | 0.430 | 0.154 |
| Pigs weaned/sow/year, n[3] | 29.3[c] | 30.1[c] | 31.5[b] | 32.9[a] | 0.27 | < 0.001 | 0.320 | < 0.001 |
| Farrowing rate, % | 77.7 | 76.1 | 84.7 | 79.1 | 3.27 | 0.319 | 0.431 | 0.179 |
| Total born, n | 15.9 | 16.5 | 16.5 | 16.8 | 0.37 | 0.061 | 0.584 | 0.002 |
| Liveborn, n | 14.2[b] | 15.1[ab] | 15.0[ab] | 15.4[a] | 0.35 | 0.017 | 0.438 | 0.001 |
| Stillborn, n | 1.1 | 0.9 | 1.0 | 0.9 | 0.16 | 0.372 | 0.626 | 0.592 |
| Mummies, n | 0.5 | 0.5 | 0.5 | 0.5 | 0.09 | 0.513 | 0.653 | 0.972 |
| Weaned, n | 12.2 | 12.1 | 12.3 | 12.5 | 0.33 | 0.410 | 0.749 | 0.156 |
| Sows culled, % | 22.1 | 22.3 | 21.8 | 16.4 | 3.20 | 0.203 | 0.334 | < 0.001 |
| Culled – open, % | 7.7 | 7.9 | 4.1 | 3.3 | 2.17 | 0.038 | 0.728 | 0.047 |

[a-c]Means within row with different superscripts differ ($P < 0.05$).

[1]A total of 1,005 mixed-parity sows (PIC, Line 1050) and litters were used from the time of cross-fostering (approximately 24 h after farrowing) until weaning. Treatment and parity category and their interaction were used as fixed effects in the statistical model. Teat-count category was included as a fixed effect in the model.

[2]Sows were allotted to treatment at approximately 24 h after farrowing. Sows were blocked by functional teat count and parity categories and assigned to one of four treatments: one less pig than functional teat count (-1), the same number of pigs as functional teat count (0), one more pig than functional teat count (+1), or two more pigs than functional teat count (+2).

[3]An assumed litters/sow/year of 2.43 was utilized.

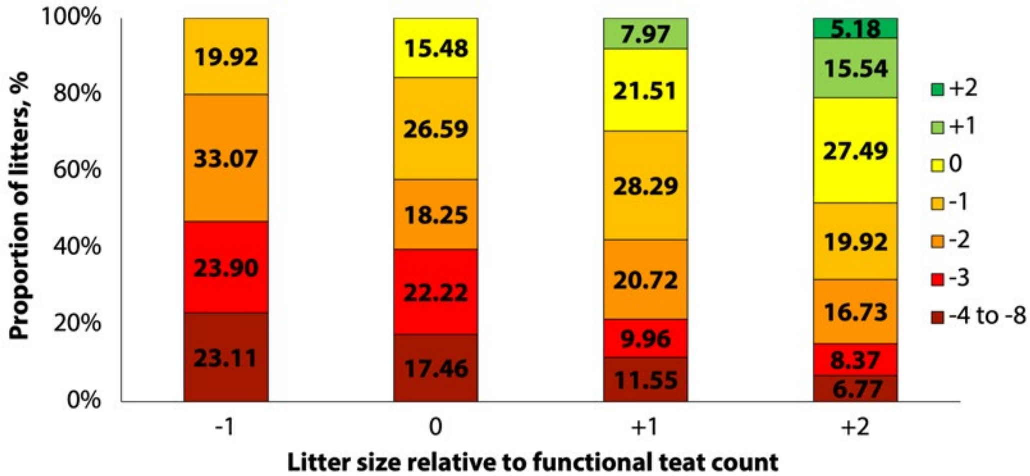


**Figure 1. Proportion of litters weaned relative to functional teat count. A total of 1,005 mixed-parity sows (PIC, Line 1050) and litters were used from the time of cross-fostering (approximately 24 h after farrowing) until weaning. Sows were blocked by functional teat count and parity categories and assigned to one of four treatments: one less pig than functional teat count (-1), the same number of pigs as functional teat count (0), one more pig than functional teat count (+1), or two more pigs than functional teat count (+2).**

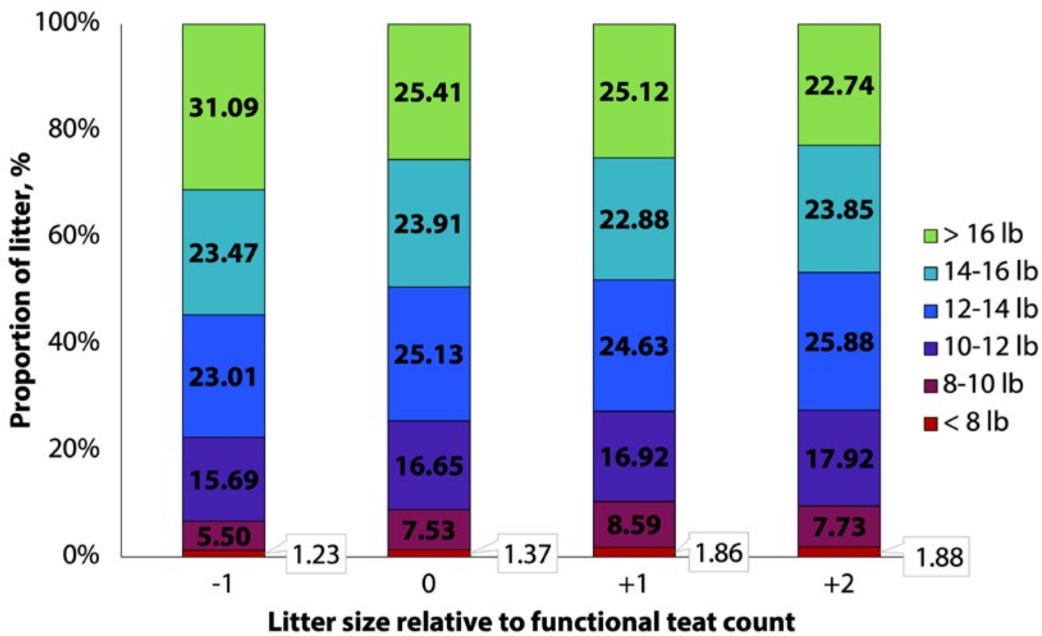


**Figure 2. Proportion of the litter weaned in each BW category. A total of 1,005 mixed-parity sows (PIC, Line 1050) and litters were used from the time of cross-fostering (approximately 24 h after farrowing) until weaning. Sows were blocked by functional teat count and parity categories and assigned to one of four treatments: one less pig than functional teat count (-1), the same number of pigs as functional teat count (0), one more pig than functional teat count (+1), or two more pigs than functional teat count (+2).**