



Evaluation of Split Suckling on Pre and Post Weaning Performance and Mortality

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TAKE HOME MESSAGE:

Split suckling by birth order or by body weight did not affect lifetime mortality or growth performance compared to no split suckling.

What is split suckling?

Split suckling is a management strategy used to ensure all piglets, specifically those in large litters, receive adequate colostrum. The process involves temporarily removing a portion of the litter from the sow to allow the remaining piglets greater access to the sow's udder to consume colostrum. Selection criteria for which piglets are removed, as well as the duration of split suckling, can vary. Typically, the first-born pigs or the heaviest weight pigs are removed, with the goal of supporting colostrum intake for lighter piglets or those born later in the birth order. Table 1 summarizes split suckling protocols and outcomes reported in various research trials. Of the 7 trials summarized, only two found that split suckling decreased pre-weaning mortality and the data does not indicate that one split suckling strategy is better than another. Therefore, more research is needed to evaluate different split suckling strategies and their effect on lifetime pig growth and mortality. The following factsheet outlines the results of a trial conducted to compare the effect of two different split suckle strategies on pre and post-weaning pig performance.

Materials and Methods

A total of 1,513 sows and their litters, 22,800 piglets total, were used in a study evaluating the effects of two different split suckle methods. The study investigated three different treatments, split suckling based on birth order, split suckling based on birth weight, and a control treatment with no split suckling. Split suckling occurred within 3 hours of the end of farrowing if a sow farrowed during the day and within 12 hours of the end of farrowing if a sow farrowed in the evening or overnight. For litters assigned to split suckling based on birth order, the first 8 pigs born in the litter were marked, then, the first 8 pigs born were removed from the sow and placed under a heat lamp in the crate for 45 minutes. After 45 minutes, the first 8 born pigs were put back on the sow, and the unmarked, later born pigs, were removed from the sow for 45 minutes. Split suckling based on body weight was applied by removing the 8 heaviest pigs in the litter for 90 minutes. After 90 minutes, all pigs were placed back on the sow. After the split suckling treatment was applied, litters were cross-fostered within treatment.

Individual pig weights were taken at birth, before split suckling and cross fostering, and at weaning. Fallback pigs were identified from d 2 to 12 post-farrowing and placed on nurse sows. All pre-weaning mortalities were recorded, including the date and reason for death. Pre-weaning mortality was only tracked on pigs that were

Table 1. Split suckling strategies evaluated in past research trials

Trial	Strategy	Timing	Duration	# of pigs removed	# of split suckle groups	Mortality	Growth Performance
Donovan and Dritz, 1996	Weight based	End of farrowing	2 h	50% of litter	1 or 2	No differences	Split suckling tended to improve
Huser et al., 2015	Weight based	Not specified	2 or 4 h	50% of litter	2	Split suckling tended to decrease	Not reported
Morton et al., 2017	Weight and birth order	End of farrowing	1.5 h	Heaviest 6 or 1st half of birth order	1	No difference	No difference
Vallet, 2019	Birth order	After 9 pigs born	4 h	5	1	Split suckling tended to decrease	Not reported
Vandaele et al., 2020	Weight based	End of farrowing	3 h	4-5	2	No difference	Split suckling decreased
Romero et al., 2023	Weight based	End of farrowing	1 h	Based on no. of functional teats	2	No difference	No difference
Arnaud et al., 2023	Weight based	4 hrs after start of farrowing	4 h	5	1	No difference	No difference

weighed at birth and does not include any pigs that were removed and placed on nurse sows. On a portion of litters, 45 per treatment, blood samples were taken 24 hours after birth. Serum was separated from whole blood and used to measure immunocrit ratio. Immunocrit ratio measures the concentration of immunoglobulins in a piglet's serum and serves as an indicator of colostrum intake. Because piglets are born without circulating antibodies, all immunoglobulins present in the blood come from colostrum. Therefore, a higher immunocrit ratio reflects greater colostrum intake. In this study, the immunocrit ratio was used to evaluate whether the split suckling treatment influenced colostrum intake.

A subset of pigs was followed into the nursery and finisher barns to evaluate post-weaning growth performance and mortality. Individual pig weights were taken at the end of the nursery and before the first marketing event in the finisher. Feed intake was measured on a pen basis in the nursery and on an individual pig basis in the finisher.

Results

There was no difference in litter size or piglet weight at birth or weaning among treatments. Immunocrit ratio was not different among the three treatments, suggesting that the split suckle strategies used in this trial did not affect colostrum intake. No differences were observed in pre-weaning mortality or the number of fallback pigs removed and placed on nurse sows. When looking at the influence of split-suckling strategy on mortality based on birth weight, no differences were found. This indicates that the split suckle treatments evaluated did not affect piglet mortality regardless of birth weight.



For the subset of pigs followed into the nursery and finisher to track lifetime performance and mortality, no differences in ADG, ADFI, or F/G were observed among treatments. No differences in mortality were observed in the nursery or finisher periods. Overall, split suckling by either birth order or body weight did not affect lifetime growth performance or mortality.

Conclusion

Split suckling by birth order or birth weight did not affect pre-weaning growth performance or mortality compared to no split suckling. Split suckling did not affect lifetime growth performance or mortality. These results suggest that the split suckling strategies used in this study had no meaningful impact on mortality or growth performance.

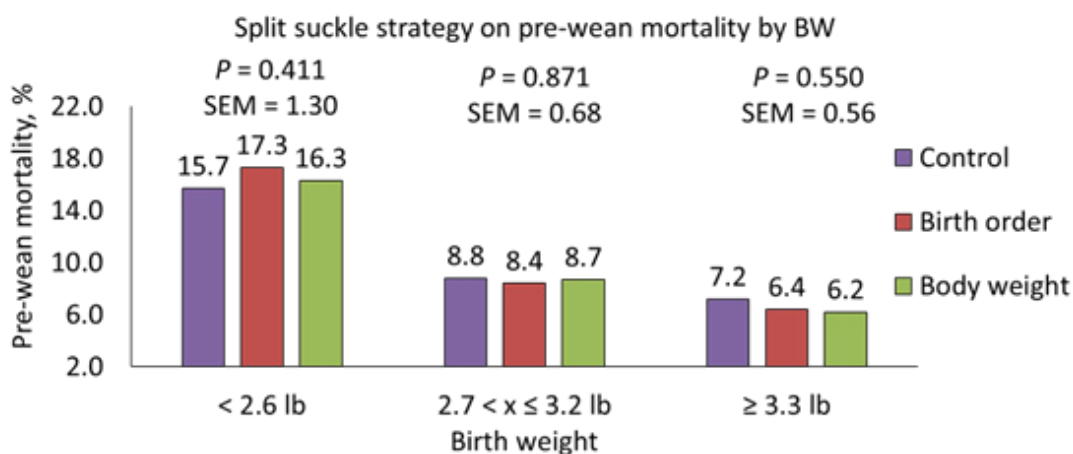


Figure 1. Pre-wean mortality was analyzed by birth weight category (light, medium, or heavy) within each treatment. To create the light, medium, and heavy body weight categories, the distribution of pig BW at d 1 was broken down into roughly three equal categories.

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REFERENCES:

1. Arnaud, E. A., G. E. Gardiner, K. M. Halpin, C. Ribas, J. V. O’Doherty, T. Sweeney, and P. G. Lawlor. 2023. Postpartum meloxicam administration to sows but not split-suckling increases piglet growth and reduces clinical incidence of disease in suckling piglets. *J. Anim. Sci.* 101:1-14. doi:10.1093/jas/skad275.
2. Donovan, T. S., and S. S. Dritz. 2000. Effect of split nursing on variation in pig growth from birth to weaning. *JAVMA*. 217:79–81. doi:10.2460/javma.2000.217.79.
3. Huser, J. S., K. J. Plush, W. S. Pitchford, T. E. Kennett, and D.S. Lines. 2015. Neonatal split suckling improves survival of small piglets. *Anim. Prod. Sci.* 55(12):1477-1477.
4. Morton, J. M., A. J. Langemeier, T. J. Rathbun, and D. L. Davis. 2019. Immunocrit, colostrum intake, and preweaning body weight gain in piglets after split suckling based on birth weight or birth order1. *Transl. Anim. Sci.* 3:1460–1465. doi:10.1093/tas/txz131.
5. Romero, M., L. Calvo, J. I. Morales, A. Magro, A. I. Rodríguez, J. Segura, R. Escudero, C. López-Bote, and Á. Olivares. 2023. Short- and Long-Term Effects of Split-Suckling in Pigs According to Birth Weight. *Animals*. 13:3521. doi:10.3390/ani13223521.
6. Vallet, J. 2019. Use of the Immunocrit to monitor a split-suckle program in commercial production. *Proc.* doi:10.1530/biosciprocs.19.0024.
7. Vandaele, M., C. Van Kerschaver, J. Degroote, C. Van Ginneken, and J. Michiels. 2020. Piglet performance and colostrum intake in litters either or not split-suckled during the first day or during the first three days of life. *Livest. Sci.* 241:104265. doi:10.1016/j.livsci.2020.104265.

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