

CALCIUM PIDOLATE SUPPLEMENTATION OF HYPERPROLIFIC SOW IN PERIPARTURIENT PERIOD IMPROVES PIGLET SURVIVAL AT BIRTH AND SUBSEQUENT PIGLET PERFORMANCE

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Resumo: The hyperprolificacy of sows results in longer farrowing duration, during which the last piglets to be born may lack oxygen, making them less vigorous at birth and therefore subject to crushing and delayed colostrum intake. Calcium pidolate is known to improve calcium metabolism. The objective of this study was to assess the effect of dietary supplementation of 3g of calcium pidolate (PCa) for 5 days pre-farrowing and 7 days post-farrowing on farrowing duration (FT), total piglets born per sow (TB), born alive (BA) and stillborn per sow, weaned (W) per sow, individual born alive piglet weight at birth, and individual weight at weaning. There were no significant differences in TB, FT, and W between treatment groups (P>0.05). The number of BA piglets was significantly higher for PCa (+1.5 piglets; P < 0.001) but there was no significant difference in percentage of stillborns. The BA piglets in both treatment groups were of similar weight at birth, but heavier at weaning for PCa (+50g; P < 0.001). Calcium pidolate supplementation during the periparturient period shows potential to improve farrowing and lactation outcomes leading to an increase in the number of piglets born alive and increased weaning weights.

PalavrasChaves: hypocalcemia; farrowing duration; piglet born; piglet growth.

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Abstract: The hyperprolificacy of sows results in longer farrowing duration, during which the last piglets to be born may lack oxygen, making them less vigorous at birth and therefore subject to crushing and delayed colostrum intake. Calcium pidolate is known to improve calcium metabolism. The objective of this study was to assess the effect of dietary supplementation of 3g of calcium pidolate (PCa) for 5 days pre-farrowing and 7 days post-farrowing on farrowing duration (FT), total piglets born per sow (TB), born alive (BA) and stillborn per sow, weaned (W) per sow, individual born alive piglet weight at birth, and individual weight at weaning. There were no significant differences in TB, FT, and W between treatment groups (P>0.05). The number of BA piglets was significantly higher for PCa (+1.5 piglets; P < 0.001) but there was no significant difference in percentage of stillborns. The BA piglets in both treatment groups were of similar weight at birth, but heavier at weaning for PCa (+50g; P < 0.001). Calcium pidolate supplementation during the periparturient period shows potential to improve farrowing and lactation outcomes leading to an increase in the number of piglets born alive and increased weaning weights.

Keywords: hypocalcemia; farrowing duration; piglet born; piglet growth.

Introdução: The hyperprolificacy of sows, enabled by improvements in genetic selection, results in longer farrowing duration, during which the last piglets to be born may lack oxygen (Quiniou et al., 2012) making them less vigorous at birth and therefore subject to crushing and delayed colostrum intake. Calcium is known for its role in muscle contractions (Al Otaibi, 2014). It is therefore essential in this context to stimulate calcium metabolism to promote uterine contractions. Calcium pidolate is known to facilitate calcium absorption (Cayon and Roquer, 1997). A recent study showed that calcium pidolate fed to sows 10 days around farrowing led to a reduction in early piglet mortality and a higher litter weight at weaning (Pithon et al., 2023). The aim of this study was to assess the effect of calcium pidolate when supplemented for a longer period (12 days) on more parameters such as farrowing duration and individual piglet weight at birth and at weaning.

Material e Métodos: A total of 18 sows (Topigs Norsvin) of parities 2, 3 and 4 were evenly distributed between a control group (T1) and a treatment group (T2). Both treatment groups were fed the same standard diet (10 MJ net energy/kg; 16% crude protein). The sows in T2 received a daily dose of 3 g of calcium pidolate (Pidolin® PCa, Dietaxion) mixed with 72 g of sepiolite, top dressed on feed from 5 days before farrowing to 7 days after farrowing. T1 received 75 g of sepiolite, also top dressed on feed. The farrowing time (FT) was taken as the difference between the birth of the first piglet and placenta expulsion from the sow. This was calculated from video recordings of the parturition process. Piglets were weaned at 28 days of age in average. The following data were collected: total piglets born per sow (TB), born alive per sow (BA), stillborn per sow, weaned per sow (W), individual born alive piglet weight at birth, and individual weight at weaning. Results were analyzed with XLstat 2022.3.1. Parity was analyzed using a Mann-Whitney test, stillborn piglets was analyzed using a Chi² test, TB and weight at birth were analyzed using an ANOVA, BA and FT were analyzed using an ANCOVA (TB as the covariate) and weight at weaning was analyzed using an ANCOVA (weight at birth as the covariate).

Resultado e Discussão: The results are detailed in the Table 1. There were no significant differences in TB, FT, and W between treatment groups (P > 0.05). In the study of Pithon et al. (2023), TB was not specified in the publication and FT was not recorded. W was not different in their trial as in ours. In our study, the number of BA piglets was significantly higher in T2 compared to T1 (+1.5 piglets; P < 0.001) but there was no significant difference in percentage of stillborn piglets. In the study of Pithon et al. (2023), the neonatal mortality (mortality within 5 days after farrowing) was reduced in the piglets fed by

sows supplemented with calcium pidolate. In our trial, the BA piglets in both treatment groups were of similar weight at birth but were heavier at weaning in T2 compared to T1 (+50g; P < 0.001) which confirm the results obtained by Pithon et al. (2023) who also got heavier litters at weaning. The absence of significant difference in other parameters could be due to small number of sows in the trial.

Table 1. Reproductive performance of sows fed a diet supplemented with 75 g of sepiolite (T1; Control), compared to sows supplemented with 3 g of calcium pidolate mixed with 72 g of sepiolite (T2; Calcium Pidolate) and subsequent piglet growth performance

	T1 (Control)	T2 (Calcium Pidolate)	SEM	P value
Parity	3.0	2.9	0.9	0.89
Total born	16.7	18.1	2.8	0.29
Born alive	15.4 ^A	16.9 ^B	3.1	***
Stillborn (% Total born)	7.3%	6.7%	0.1	0.84
Total duration of farrowing (min)	237	184	69	0.47
Weight at birth (kg)	1.24	1.24	0.3	0.87
Weaned piglets	12.0	12.4	1.5	0.50
Weight at weaning (kg)	6.27 ^A	6.32 ^B	1.8	***

Data presented as means; ^{A,B}Means within a row with different superscripts differ significantly (P < 0.001); *** P < 0.001

Conclusão: Calcium pidolate supplementation during the periparturient period led to an increase in the number of piglets born alive and increased weaning weights. This compound shows potential to improve farrowing and lactation outcomes, although studies with larger numbers of pigs are required to confirm mechanisms of action.

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