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Long term effect of feeding spray dried plasma during the nursery on subsequent performance and health status to market weight

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Introduction

The benefits of feeding spray dried plasma (SDP) during the post-weaning period are well known (1). However, there are limited studies about the long-term impact of feeding SDP to nursery pigs on subsequent performance and health status of grow-finish (GF) pigs (2). This study aimed to determine the effects of various quantities of SDP provided during the nursery phase on subsequent performance and health of GF pigs to market weight.

Materials and Methods

300 PIC pigs weaned at 22d of age and 5.81 ± 0.04 kg BW were allotted to 5 treatments in separate sex pens (12 pens/treatment; 5 pigs/pen). Treatments represented the inclusion of different SDP levels used in 4 nursery feed phases (pre-starter I and II, d22-29 and d29-36; starter I and II, d36-43 and d43-64 of age). Treatments by respective nursery phases and level of SDP in the diet were: T1) Control without SDP; T2) 3, 2, 0 and 0% SDP; T3) 5, 3, 1 and 0% SDP; T4) 7, 5, 3 and 0% SDP; T5) 7, 5, 3 and 1.5% SDP, respectively representing 0, 86, 165, 311 and 600 g of SDP consumed/pig. Thereafter, the nursery pen was maintained and moved to the GF facility where the pigs were fed common diets by phase to market weight. Performance data were evaluated per phase and the index of pneumonia (IP) was obtained at slaughter. Regression analysis using the covariance of initial BW was done considering the effects of sex, block, wean batch, and the average cumulative grams of SDP consumed per pig. Non-normal pneumonia index data was compared by Kruskal-Wallis's test.

Results

Table 1. Nursery to finish performance of nursery pigs fed different grams of SDP per pig (values in kg).

Parameter	SDP intake, g/pig					P value
Nursery	0	86	165	311	600	
ADFI	0.582	0.628	0.619	0.612	0.610	C[1]
ADG	0.396	0.430	0.427	0.415	0.416	C[2]
FCR	1.469	1.460	1.453	1.473	1.463	ns
FBW	22.45	23.88	23.77	23.23	23.29	C[2]
Grow-finish						
ADFI	2.295	2.304	2.330	2.410	2.386	L[3]
ADG	0.972	0.969	0.982	1.001	0.991	ns
FCR	2.360	2.379	2.372	2.407	2.406	ns
FBW	117.2	118.5	119.7	120.9	120.2	ns
Overall nursery-finish						
ADFI	1.770	1.800	1.811	1.861	1.816	Q[4]
ADG	0.798	0.808	0.815	0.824	0.819	ns
FCR	2.216	2.233	2.220	2.255	2.215	ns

[1] Cubic response to SDP intake (P = 0.08). [2] Cubic response to SDP intake (P < 0.05). [3] Linear response to SDP intake (P < 0.05). [4] Quadratic response to SDP intake (P = 0.08). ns=not significant (P>0.10).

Table 2. Index of pneumonia (IP) in lungs of finishing pigs at slaughter.

Parameter	SDP intake, g/pig					P-value
	0	86	165	311	600	
IP	2.20[b]	0.87[a]	0.63[a]	0.57[a]	0.75[a]	0.01

IP - the frequency of the lung lesions of each pig in each category was recorded in an index from 0 – 6, with 0 being absent of lesions and 6 100% lesions. [a.b] different letters indicate a significant difference by Kruskal-Wallis's test.

Discussion and Conclusion

Total wean to finish culling+mortality was (4.7%) and did not differ among treatment groups. Table 1 shows that SDP increased (P<0.05) ADG and FBW and tended (P = 0.08) to increase ADFI in a positive cubic response to SDP intake per pig while in the nursery. These subsequent positive effects of SDP intake linearly increased (P < 0.05) ADFI of pigs during the grow-finish phase and tended (P = 0.08) to increase ADFI over the entire nursery to finish period. Increasing level of SDP fed during the nursery numerically and linerarly increased (P=0.13) final BW at slaughter with a maximun increase of FBW for pigs fed 311 g SDP per pig during the nursery. Remarkedly, all SDP treatments provided during the nursery phase reduced the index of pneumonia lesions in lungs of pigs at slaughter weight compared to the control treatment group (Table 2). The reduced IP index is in agreement with other research indicating reduced severity of respiratory diseases in pigs and other species fed diets with SDP (3). This potential modulation of immunity from feeding SDP could be linked to the better GF performance and reduced pneumonia score at slaughter. There are few studies evaluating the effects of SDP fed in the nursery and its impact on subsequent phases of production. However, our results agree with others (2) that verified challenged pigs fed SDP during the nursery phase had improved immune response, survival, growth performance, and carcass traits of GF pigs, while also showing a synergic effect with a combined Mhyo-PCV2 vaccine. In conclusion, feeding SDP to nursery pigs demonstrated extensive benefits through the GF phase by improving performance and health of pigs at market weight.

References

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