

Effect of different dietary fiber sources and pharmacological level of ZnO on the growth performance of weaned piglets

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Background and objectives

Altering feed composition can be an alternative to the therapeutic usage of zinc oxide (ZnO) to maintain piglet performance and to reduce post-weaning diarrhea. Supplementing the diet with the right functional fiber source is one way to replace ZnO. Inert fiber sources may improve the gut health of weaned pigs by modulating the activity of intestinal microbiota (Molist et al., 2011). The aim of the study was to investigate the effect of different fiber sources on pig performance compared to a diet containing pharmacological level of ZnO during the prestarter phase (from 0-21d post-weaning) and during the subsequent phase (21-36d post-weaning).

Materials and methods

An experiment was conducted at the Product Development and Monitoring Research Centre at Kaposvár University, Hungary, to investigate the effect of replacing the pharmacological ZnO (2500 ppm) with different fiber sources. 192 DanBred piglets were weaned at 25 d of age (with 6.32 kg BW) and were assigned to 24 pens (6 pens/treatment; 8 piglets/pen). During the trial, four dietary treatments were fed [control diet with ZnO (ZN), inert fibers: 20% extruded oat (EO), 2.5% lignocellulose (LC); slow fermentable fiber: 5% sugar beet pulp (SB),] during 21 d after weaning. Diets were formulated to be isoenergetic (NE: 10.40 MJ/kg) and isoproteic (CP: 18.3%). A common starter diet without ZnO was fed during the subsequent starter phase (21-36d post-weaning).

Results

From 0-21d post-weaning, pigs from the ZN and SB group compared to the EO and LC group had higher ($P<0.05$) ADG (245, 255 vs. 201 and 213 g/day) and ADFI (303, 299 vs. 264 and 259 g/day), respectively. FCR (Feed:gain) was higher ($P<0.05$) in the EO group in comparison to the other treatment groups. From 21-36d post-weaning, pigs from the ZN group had lower ($P<0.05$) ADG (463 vs. 507 and 520 g/day) compared to the EO and SB groups, respectively. Feed intake during this phase was lower ($P<0.05$) in the ZN group (664 g/day) compared to that of the SB group of pigs (769 g/day). FCR did not differ during the starter phase. Overall (0-36d post-weaning), the SB group pigs had better ($P<0.05$) ADG than the EO and LC pigs and had higher ADFI ($P<0.05$) compared to the LC pigs. There was no effect of the different fiber sources on the overall growth performance compared to the ZN group.

Conclusion and discussion

The results of this study indicated that from 0-21d post weaning using a slow fermentable and resistant starch containing fiber source (SBP) similar performance can be achieved as using therapeutic level of ZnO, in contrast to feeding inert fiber sources (EO, LC). The pigs fed EO or SB diet without ZnO during the prestarter phase had better growth performance from 21-36d post weaning, during the common starter diet compared to that of the ZN group pigs. Although, using pharmacological level of ZnO had positive effect on the performance during the prestarter phase, it had a negative effect during the subsequent starter phase compared to the different fiber sources. Overall, there was no effect of ZnO during the prestarter phase on the overall growth performance of the pigs in comparison to the different dietary fiber sources.

References

Molist, F., Hermes, R.G., de Segura, A.G., Martín-Orúe, S.M., Gasa, J., Manzanilla, E.G., Pérez, J.F., 2011. Effect and interaction between wheat bran and zinc oxide on productive performance and intestinal health in post-weaning piglets. *Br J Nutr.* 105(11):1592-1600.