

Effects of coated and potentiated ZnO on some gut health parameters in weaned piglets

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Background and objectives

The potentiated ZnO source HiZox® (Animine, France) was shown to be advantageous for piglet performances (Cho et al. 2015, Morales et al. 2012, Raquipo et al. 2017). More specifically, we demonstrated that the potentiated ZnO source when added to a barley-corn-wheat and SBM diet, reduced digesta Enterobacteriaceae numbers and improved gut integrity, albeit similar or better, depending on the dosage, to the effects of pharmacological dosage of conventional ZnO (Wang et al. 2019). The current study aimed to study the effects of potentiated ZnO and coated ZnO on gut bacteria and function in piglets fed a corn and SBM diet.

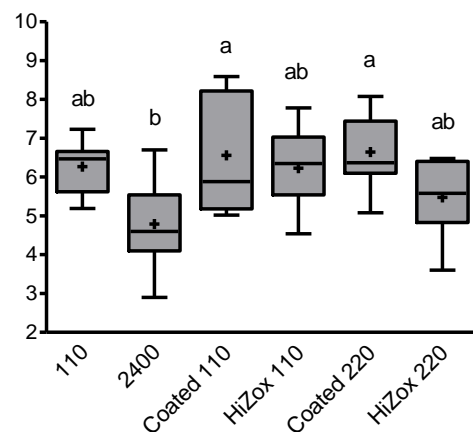
Material and methods

A total of 108 piglets were fed 6 corn-SBM based experimental diets, each diet replicated in 3 pens of 6 piglets, during 14 days: standard ZnO at 110 (negative control, NC) or 2400 mg/kg Zn (positive control, PC), coated ZnO (110 or 220 mg/kg Zn) or potentiated ZnO source (110 or 220 mg/kg Zn). Piglets were weighed at d0 and d14, and feed intake was recorded for each pen. At the end of the experiment, 3 piglets per pen were sacrificed. Small intestinal samples were collected for enumeration of bacterial numbers (*E. coli*, coliforms), histomorphological indices, and mucosal alkaline phosphatase (IAP) activity.

Results

NC showed the lowest weight gain (84 g/d) and PC the highest (120 g/d) during the 14 days of the trial, with others in between ($P>0.05$). Accordingly, PC exhibited longer villi than NC (513 vs. 424 μm , $P<0.05$), while other groups were not different from NC. In the proximal small intestine, numbers of *E. coli* were significantly higher for the coated ZnO and for NC than for PC. Intermediate results were obtained with potentiated ZnO. *E. coli* and coliform populations in the distal small intestine were significantly higher for the coated ZnO than for PC. IAP activity was increased for PC ($P<0.05$) and numerically higher for potentiated ZnO than for NC and coated ZnO in distal small intestine (see figure).

Coliform bacteria in distal small intestine (\log_{10} CFU/g)



Conclusion and discussion

ZnO at a pharmacological dose showed improvements of gut health indices when compared to coated ZnO and NC, while potentiated ZnO obtained intermediate results. The effects of potentiated ZnO were dose-dependent and in line with our previous work.

References

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