

Effect of feeding a diet containing MiaTrace Zn or zinc oxide on productivity and health in weaned piglets

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Background and objectives

The therapeutic use of zinc oxide in high doses (e.g. 2,500 ppm Zn) has yet demonstrated beneficial effects on growth performance in piglets as well as the prevention of post-weaning diarrhea. The precise mode of action is still not known, but recent results indicate that the zinc-ions affect the gastrointestinal milieu and thus prevent the adhesion of pathogens. The objective of the current study was to investigate the effects of MiaTrace Zn, which provides a higher gastro-stability compared to a therapeutic zinc oxide supplementation on health and performance parameters in 7-30 kg piglets. The study was conducted on Skjoldborg test station, Denmark.

Materials and methods

For the current study 2309 weaned pigs (25 ± 3d of age) were randomly allocated into two treatment groups (18 observations per group with ~64 piglets per observation). Both treatments received the same basal diets in a three phase feeding regime (d 0-14, d 14-28, d 28-42) using automatic feeders. In the control group piglets received 2,400 ppm zinc from zinc oxide from d 0-14 and from d 14-42 130 ppm zinc from zinc oxide. In the trial group piglets got from d0-42 130 ppm Zn from MiaTrace Zn. The piglets were weighed on day 0, 14, 28 and 42. At day 14, 28 and 42 the amount of feed was recorded. Number of dead piglets, piglets taken out (PTO) and diarrhea related treatments (DRT) were registered as well as weight of pigs taken out of study. Average daily gain (ADG) per piglet, feed intake and feed utilization (FU) were calculated based on this data. All statistical analyses were done by Danish Technological Institute.

Results

No difference between diets were found regarding ADG at day 14 (P=0.62), day 28 (P=0.88), day 42 (P=0.50) or within the whole period from day 0 to 42 (P=0.98). ADG from d 0-42 was 0,52kg/d in both groups. No significant difference was found regarding FU at day 14 (P=0.46), day 28 (P=0.42), day 42 (P=0.36) or for the complete period from day 0 to 42 (P=0.38). FU from d 0-42 was 1.56 in control and 1.52 in MiaTrace Zn group. In general, piglets maintained good health during the experiment. No difference between PTO day 14 (P=0.22), day 28 (P=0.05) and day 42 (P=0.49), and DRT day 14 (P=0.62) was found.

Table 1. PTO, number of pigs from d 0-14, d 14-28 and d 28-42 and DRT, number of pigs d 0-14 of pigs fed diet MiaTrace Zn or ZnO.

| | Day | MiaTraceZn | ZnO | P-value |
|-----|-----|------------|---------|---------|
| PTO | 14 | 0.004a | 0.008a | 0.22 |
| | 28 | 0.008a | 0.017a | 0.05 |
| | 42 | 0.005 a | 0.004 a | 0.49 |
| DRT | 14 | 0.004 a | 0.003 a | 0.61 |

a Means within rows without a common superscript differ (P≤0.05).

Conclusion and discussion

In conclusion, no differences between diets were found regarding ADG or FU at day 14, 28, 42 or over the complete phase from day 0 to day 42. Moreover, no difference was found regarding PTO at day 14, 28 or 42, and DRT day 14. This conclusion is valid when comparing the product MiaTrace Zn with the traditional Danish use of zinc oxide, i.e. at different dose levels, sources and possibly also different solubility of zinc ions.

Supplementing a diet with MiaTrace Zn can meet legal regulations of zinc supplementations without losing performance parameters in piglets. Additionally, the environmental impact of high zinc oxide dosages can be reduced.