

Supplementation of weaner diets with high levels of zinc

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Post-weaning diarrhoea is a major problem of the pig industry. In some instances, piglets will die but in most cases there is a reduction in efficiency of digestion and the absorption of nutrients, and consequently an increase in the time taken to reach market weight. Zinc oxide (ZnO) has traditionally been added to pig weaner diets at 0.125 kg ZnO/t for the prevention of Zn deficiency, but more recently the beneficial effects of adding high levels of ZnO (e.g. 3 kg/t) has been reported (Holm, 1990). This is now a common practice and is considered an inexpensive alternative to the use of antibiotics for the control of post-weaning diarrhoea. However, the increased use of piggery waste for composting has identified high concentration of Zn in faecal material as a problem. Organically bound or bioplexed Zn (Bioplex™Zn) has a higher bioavailability than inorganic Zn, and therefore could overcome the problems associated with the use of ZnO provided pig performance is not compromised.

The aim of this study was to evaluate the use of Bioplex™Zn as an alternative to ZnO for weaner pigs. The experiment was conducted over a 5-week period (1st stage for 2 weeks, 2nd stage for 3 weeks) in a high-health status commercial piggery with pigs housed in groups of 26 or 27. An equal number of entire male and female pigs were allocated to one of the following treatments according to weight and sex: Control: no added Zn besides that included in mineral premix, ZnO: 3 kg ZnO/t in 1st stage, and 2 kg ZnO/t in 2nd stage, Bioplex™100: 100 ppm Zn as Bioplex™Zn, Bioplex™250: 250 ppm as Bioplex™Zn. All pigs were water medicated with Apralan® for the first five days, and during the second week post-weaning received Acid-Pak™ via drinking water for five days. Three faecal samples were collected from each pen at the end of the experiment and analysed for Zn. Liveweight (LW) was recorded for individual pigs and pigs observed daily for diarrhoea.

Treatment	Control	ZnO	Bioplex™100	Bioplex™250	l.s.d.
No. pigs	103	106	106	105	
LW (kg)					
Day 0	6.41 ^a	6.47 ^a	6.85 ^b	6.57 ^a	0.200
Day 39 ¹	20.87 ^a	21.75 ^b	22.37 ^b	23.23 ^c	0.767
ADG (g) ¹	367 ^a	389 ^b	405 ^b	427 ^c	19.7
Faecal Zn (ppm)	2290	8910	1960	1830	931

^{abc} means in a row differ ($P < 0.001$). ¹ adjusted for difference in LW at day-0.

There were no significant differences in the performance of entire males or females during the experiment. Pigs on the Bioplex™250 treatment had a superior average daily gain (ADG) and subsequently weighed 2.3 kg more than the Control pigs at the end of the experiment. There was no significant effect of any treatment on the incidence of post-weaning diarrhoea. Faecal zinc levels in the two Bioplex™ treatments were similar to that for the Control pigs, but were approximately 80% less than for those pigs fed high levels of ZnO. Feeding weaner pigs with an organic form of Zn improved growth rate while reducing the concentration of Zn in faecal material.

Reference

1. Holm A. *E.coli* associated diarrhoea in weaner pigs: zinc oxide added to the feed as a preventative measure? Proc. IPVS Cong. 616.

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