

THE EFFECT OF ADMINISTRATION OF PROTECTED ZINC OXIDE ON DIARRHOEA OCCURENCE IN POST-WEANING PIGLETS

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Introduction

Diarrhoea is one of the main causes of growth depression and subsequent losses due to mortality in piglets in the period of 14 days post weaning. The application of high doses of ZnO helps to suppress scours after the weaning (1), but it has a negative impact on the environment therefore there are efforts aimed at decreasing the doses. The objective of this experiment was to verify effects of the administration of ZnO (Zinteral[®]) produced by the company Lohmann Animal Health GmbH & Co on the incidence of diarrhoea in piglets and the impact on performance. Zinteral contains 20 % zinc in the form of ZnO; the dosage is 500g per 1 ton feed.

Materials and methods

The experiment consisted two phases (I and II), one week apart, both conducted in field conditions. Post-weaning piglets from 27 to 34 days of age were allocated in 8 pens, 16 animals in each, with 4 pens being control ones (C) and 4 trial ones (T). First 14 days a diet A was given, next 21 days a diet B. Feed consumption was recorded every 7 days. Results of laboratory analyses are listed in Table 1.

Table 1 Nutrient composition of the diets

	Zinteral [®] (T)		Control (C)	
	Diet A	Diet B	Diet A	Diet B
MEp, MJ	13.7	12.6	14.0	13.3
CP, g	192	187	188	189
Lysin, g	14.0	14.0	12.7	1.0
Zn, mg	200	150	2180	150
¹ Avilamycin	no	no	yes	yes
² Tilmicosin	yes	no	no	no

¹growth promoter, ²solution of respiratory diseases

The trial lasted 35 days. Animals were weighed in groups by pens, first time at the allocation in the trial, then in seven day intervals. On days 1, 8 and 15 bacteriological examinations of rectal smears were carried out, with 2 piglets being chosen from each pen and repeated examinations being performed with the same piglets.

Furthermore, during first 14 days consistency of faeces was examined and recorded for each pen separately, always in the morning before tidying up the pens, according to the following scale. Normal solid, shaped faeces – 0; soft, shaped faeces – 1; soft, shapeless faeces – 2; liquid faeces – 3. T-test was used to evaluate results and f-test to calculate statistical significance of differences between the variances.

Results and Discussion

During the phase I one animal was removed from the treated group due to an injury. During the phase II two piglets died. The deaths occurred on trial day 12 in the control group and on day 12 in the treated group. First two days after the weaning lower faeces quality was observed as well as from day 6 to day 10 post weaning in all the groups.

In isolated cases liquid faeces occurred; this condition, however, never lasted more than two days and was observed only in a small number of animals in a pen, and no curative veterinary products were applied. In Table 2 summarized values of faeces quality are listed, each sum representing faeces quality values in 4 control and 4 treated pens. Sums of values from the whole trial period (S) show minimum differences between control and trial groups.

Microbiological examinations detected the presence of *E.coli* K88+, see Table 3. In the phase I total collection of *E.coli* was higher in the control group, in the phase II in the treated group. In both the phases a statistically significant decrease in live weight gain (ADWG) till the 14th day after the weaning was observed. However, in the period from day 15 to day 35 post weaning this trend changed, as the results of the treated group in the phase II show. The improvement of weight gain in the group T2 in the phase II could have been caused by significantly higher initial live weight than the phase I mean live weight, see Table 4.

Table 2 Sum of results of daily faeces quality evaluation

Day	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	S
T1	7	4	4	4	4	6	7	4	4	5	4	4	4	7	68
C1	9	8	4	4	4	4	6	4	4	6	4	4	4	4	69
T2	5	5	4	4	4	4	4	6	6	5	6	7	8	5	73
C2	8	6	5	4	4	4	4	4	4	4	4	4	4	6	65

(E1,C1-phase I, E2,C2-phase II, S-sum)

Table 3 Collection of *E.coli* K88+ expressed in %

	n	T1	C1	T2	C2
Day 1 %	(8)	0	12.5	25.0	12.5
Day 8 %	(8)	25.0	75.0	37.5	0
Day 15 %	(8)	37.5	37.5	50.0	25.0

Table 4 Summarized performance results in both the phases

	T1	C1	T2	C2
Initial live weight, kg	8.58 ^c	9.05	9.89 ^d	9.86
ADWG, 1-14, g	246 ^a	400 ^b	241 ^a	361 ^b
ADWG, 15-35, g	516 ^a	585 ^b	596	587
ADWG, 1-35, g	408 ^a	511 ^b	453	496
FCR, 1-14, kg	1.55	1.20	1.79	1.37
FCR, 15-35, kg	1.51	1.61	1.63	1.56
FCR, 1-35, kg	1.52	1.48	1.67	1.50

Different superscripts designate statistically significant differences within groups at levels of significance alpha = 5% ^{a,b}, alpha = 10% ^{c,d}.

Conclusion

In this trial favourable effects of Zinteral[®] administration on diarrhoea prevention were demonstrated in piglets of which more than one fourth was colonized by the *E.coli* K88+ strain.

References

1. Close W.H. (2002) *Proced.of Alltech's 18th Annual Symposium*, 401-406