

108**Effects of replacing zinc oxide with a combination of β -glucan, *Bacillus subtilis* PB6 and formic acid on the performance of weaner pigs**

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Application

The combination of the β -1,3-glucan type immunomodulator and a probiotic (*Bacillus sp.* PB6) and formic acid appears to be an effective replacement for ZnO in diets of weaner piglets.

Introduction

inc oxide (ZnO) has been used at high doses in diets of pigs to reduce incidence and severity of post-weaning diarrhoea. In June 2022, the use of supra-nutritional levels of ZnO in pig diets was banned due to environmental pollution concerns. This study evaluated the efficacy of using a combination of additives, a β -1,3 -glucan, a *Bacillus sp.* PB6 and an encapsulated calcium formic and citric acid to replace ZnO in weaned piglets.

Materials and methods

Weaner piglets (380) were balanced for sex and weight then randomly allocated to two diets. The control group were offered a standard commercial pre-starter diet with ZnO (2500 ppm) on days 28-42, followed by a ZnO free starter diet on days 43-70. The treatment group, received a ZnO free pre-starter diet, with β -1,3 -glucan (AletaTM) (200 g/ton) + *Bacillus sp.* PB6 (CLOSTAT^R) (1000 g/ton) + encapsulated formic acid (FormylTM) (2 kg/ton) on days 28-42, followed by a starter diet with β -1,3 -glucan (200 g/ton) + *Bacillus sp.* PB6 (500 g/ton) on days 43-70. The trial was run in batches over three periods. In each run, 3 pens were allocated to each diet, replicated over 3 periods giving a total 9 pens per treatment. Body weights, piglet mortalities, faecal parameters (consistency scores, pH, dry matter) were measured. Data were analysed with One-Way ANOVA with batch used as block, using Genstat[®].

Results

Postweaning piglet mortalities were low and similar on the two diets. Faecal parameters such as DM, consistency scores and pH were also similar. The additives used to replace ZnO resulted in similar liveweights and average daily gains (ADG) from days 28-42. At day 70, pigs on the ZnO free diet were heavier (29.8 kg) compared to those on standard diet (28.9 kg) (sed = 0.405, $P = 0.029$). ADG (g/day) for days 28-70, 42-70 and 56-70 were consistently higher in pigs on the ZnO free diet, than on the standard diet; with average values of 512 vs 490 (sed = 7.30, $P = 0.003$), 608 vs 560 (sed = 9.69, $P < 0.001$) and 678 vs 636 (sed = 14.89, $P = 0.006$), respectively.

Conclusions

The combination of additives used elicited comparable levels of performance in weaner pigs and in some cases exceeded the traditional ZnO based diet. The improvements in performance on the ZnO free diet translated into pigs that were approximately 1 kg heavier at day 70.

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109**A description of ear-directed and other damaging behaviour and ear lesions in weaned pigs**

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Application

Increase the understanding of the etiology and risk factors of ear necrosis to improve pig health and welfare.