

SUBSTITUTION OF ZnO BY A COMBINATION OF MEDIUM CHAIN FATTY ACIDS AND MONOGLYCERIDES WITH OR WITHOUT LEONARDITE SEVEN DAYS AFTER WEANING

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Background and objective

High doses of Zinc oxide (ZnO) has been used intensively for the diarrhea control in the 14d post weaning period in piglets, and in some problematic farms, even longer. ZnO-based veterinary medicinal products will be banned in 2022. The early phase out of the product is an intermediate step to completely substitute it for other products. The monoglycerides (MG) of medium chain fatty acids (MCFA) are esters of MCFA with glycerin, and have a big capacity of regulating a wide range of microorganisms. Leonardite is a complex product with antibacterial and anti-inflammatory properties, rich in humic acids.

The objective of this study was to evaluate the effect of substitution of zinc oxide in starter piglet diets with monoglycerides of medium chain fatty acids with two levels or leonardite.

Material and methods

A total of 480 Durocx(Landarce*Large white) piglets (50% males/females) weaned at 28d were used. The pre-starter diet (28-36d) was common and included ZnO (3,100ppm). Starter feeds were based on barley, wheat, soybean meal 47%, and contained 2,421 kcal EN/kg, 18% crude protein and 1.30% of digestible Lys. There were four treatments, i) ZnO (3,100ppm), ii) A mixture of organic acids and MG at 10kg/t (ENS), iii) ENS plus 3kg/t of leonardite (ENS+LEO3) and iv) ENS plus 6kg/t of leonardite (ENS+LEO6). The experimental unit was a box of 30 piglets, and there were 4 replicates/treatment. Feed and water was supplied *ad libitum*. Data were analyzed with an ANOVA with the initial body weight as a covariate, and treatment as main effect.

Results

Piglets fed ENS+LEO3 and ENS+LEO6 presented diarrhea one week after the beginning of the trial (14d post weaning) and were treated individually with antibiotics. At 75d, piglets fed with ZnO, ENS+LEO3 or ENS+LEO6 tended to show higher weight than those fed with ENS (28.14, 27.24, 28.69, 27.81kg for ZnO, ENS, ENS+LEO3 and ENS+LEO6, respectively, P=0.066). For the whole period (36-75d), the same effect was found for growth, but no differences were found neither for daily feed intake (0.744, 0.720, 0.766, 0.728 g/d for ZnO, ENS, ENS+LEO3 and ENS+LEO6, respectively, P=0.197) nor for feed conversion ratio (1.495, 1.516, 1.497, 1.487 g/g for ZnO, ENS, ENS+LEO3 and ENS+LEO6, respectively, P=0.363). No significant differences in mortality were also found (3.4, 0.8, 0.0, 1.7% for ZnO, ENS, ENS+LEO3 and ENS+LEO6, respectively).

Conclusion and discussion

The piglets fed ZnO shown a slightly higher growth, especially in the first 15d (+5.3%). However, this difference was diluted until the end of the experiment (+0.8%). For unknown reasons the animals fed leonardite at any dose showed diarrhea symptoms, and had to be antibiotic treated. This fact could interact with the final results of these two treatments. However, animals fed ENS showed an acceptable performance without the need of any antibiotic or ZnO after 35d. Taking into account that the bigger ZnO feed intake is in the second week after weaning, the use of this strategy could be an intermediate step in the full withdrawal of ZnO in piglet diets. It can be concluded that the use of the mixtures of organic acids and MG could be an alternative for ZnO after 7d after weaning; being impossible to interpretation the effect of leonardite due to the interaction with the antibiotic treatment.