

Plant bioactives (Silvafeed® Nutri P) to reduce effectively post-weaning diarrhoea in piglets

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Background and objectives

Pig production is to phase out the pharmacological use of zinc oxide (ZnO) to tackle environmental concerns and the spread of antimicrobial resistance. Thus, efficient alternatives for the control of post-weaning diarrhoea in piglets are urgently needed. Silvafeed® Nutri P is a natural feed additive rich in bioactive polyphenols, which have been extensively studied for their biological properties (e.g. antispasmodic, antimicrobial, antioxidant) and potential health benefits. Recently, the effectiveness of Silvafeed® plant bioactives in reducing the severity of post-weaning diarrhoea has been well described in piglets either infected (experimental ETEC F4 model) or non-infected (Girard et al, 2018). Here, we report two trials conducted under experimental conditions, assessing further the efficacy and the mode of usage of Silvafeed® Nutri P to reduce post-weaning diarrhoea in piglets as compared to high level of ZnO.

Material and methods

Experiment 1 (Guangxi University, China). A preliminary trial was performed with one hundred and five weaned piglets (Duroc x (Landrace x Large White), which were randomly allocated to seven homogeneous pens (n=15). In each pen, the piglets received a basal diet supplemented with ZnO or standard/coated Nutri P at different inclusion levels for 18 days (Group with ZnO at 2000 ppm; Groups with standard Nutri P at 500, 1000 and 1500 ppm; Groups with coated Nutri P at 500, 1000 and 2000 ppm). After three days of adaptation, the incidence of diarrhoea was evaluated three times daily (09:00; 15:00 and 21:00) and the diarrhoea rate was calculated for each group. Experiment 2 (Agriculture University, Beijing, China). One hundred and eight weaned piglets [Duroc x (Landrace x Yorkshire), average weight 7.81 ± 0.01 kg] were randomly allocated to one of three treatment groups with six replicates (n=6 piglets balanced for sex). The dietary treatments consisted of a negative control (basal diet), ZnO supplementation (2000 ppm for d0-14; 137.5 ppm for d15-28), and Nutri P supplementation (1000 ppm). At day 28, samples of the intestinal mucosa and digesta were recovered from different gut segments of the piglets for further analysis (intestinal morphology and microbiota). The performance and nutrients digestibility were evaluated as well as the diarrhoea rate (only the first 14 days). The statistical analyses were performed with SPSS software. The performance, digestibilities and diarrhoea rate were compared between the groups by one-way ANOVA with 0.05 considered as significance level.

Results

Experiment 1. The diarrhoea rate decreased linearly with increasing doses of Nutri P (10.00% to 6.19% with Nutri P at 500 and 1500 ppm, resp.), which was comparable with ZnO at 2000 ppm (9.50%). Yet, diarrhoea rates were constantly higher with coated Nutri P regardless of the dosage (12.38–20.95%). Experiment 2. The performance and nutrients digestibility of piglets were comparable between the three treatment groups ($P>0.05$). The supplementation with Nutri P at 1000 ppm substantially reduced the diarrhoea rate in piglets compared with the negative control (5.3 and 8.5%, resp.). The use of ZnO at 2000 ppm also reduced the incidence of diarrhoea episodes compared with negative control (3%; $P<0.05$). Preliminary results on intestinal morphology show an improvement of the villus:crypt ratio in piglets supplemented with ZnO and Nutri P compared with piglets in the control group.

Conclusion and discussion

Silvafeed® Nutri P can act to support animal gut health and has proved to reduce the incidence and severity of post-weaning diarrhoea in piglets. These promising results show that the use of natural feed additive Silvafeed® Nutri P can be implemented to replace high level of ZnO in piglet diets.

References

Girard M., Thanner S., Pradervand N., Hu D., Ollagnier C., Bee G. (2018). Hydrolysable chestnut tannins for reduction of postweaning diarrhea: Efficacy on an experimental ETEC F4 model. PLoS ONE 13(5): e0197878