

Condensed tannin (Black Wattle extract) can replace zinc oxyde in nursery piglets' rations

Kelly Souza¹; Caio Silva²; Cleandro Pazinato¹; Marco Callegari¹, André Friderichs³, Alcides Oliver Sencio Paes³

¹AKEI Animal Research, Fartura, SP, Brazil; ²Universidade Estadual de Londrina, Paraná, Brazil,

³TANAC, Montenegro, RS, Brazil

Background and objectives

Tannin is a heterogeneous complex of polyphenols of plant origin, that can be presented in two different forms, hydrolysable or condensed (1). Tannin has been used as a performance enhancer in farm animals due to its action on protein metabolism and factors associated with intestinal health (2), highlighting antioxidant, anti-inflammatory and antimicrobial properties (3). The aim of this work is to evaluate a commercial source of condensed tannin (Tanfeed®), an extract of Black Wattle, as a substitute of zinc oxide on performance, digestibility, and intestinal health of piglets in the nursery phase.

Material and methods

200 pigs, barrows and females, PIC, 22 d of age and 6.005±0.894 kg of weight were submitted to four treatments during the nursery phase (22 to 64 d of age): T1 (basal diet); T2 (basal diet +0.2% Tanfeed); T3 (basal diet + 100ppm enramycin + 2.500 zinc oxide during 21d); T4 (basal diet + 0,3 % sodium butyrate). The experimental design was in randomized blocks with four treatments and 10 repetitions, being a pen with five animals the replicate. Performance and diarrhea incidents (n) and score were evaluated. At 42 days of age, feces were collected from the deep rectum to the metagenomic analysis. Between 43 to 50 days of age the piglets were submitted to digestibility assay through a partial feces collection method. Performance data were submitted to Tukey's Test and the diarrhea data was compared by chi-squared test. Richness and diversity indices were compared using an ANOVA test with Bonferroni correction for multiple comparisons using GraphPad Prism 7.0a.

Results

Table 1. Performance of piglets in the nursery phase according to the treatments

Parameters	Control	Tanfeed	Enramycin+ZnO	Na Butyrate	CV (%)	P-value
DFI, kg	0.555	0.603	0.573	0.606	10.37	0.197
DWG, kg	0.360b	0.394a	0.365ab	0.382ab	18.90	0.067
FC	1.544	1.531	1.571	1.584	4.50	0.324
Final weight, kg	21.162b	22.586a	21.338ab	22.082ab	14.07	0.085

No difference was verified between the treatments for semi-liquid diarrhea (score 2), but the control group showed more cases of severe diarrhea (score 3) ($P<0.05$) compared with Tanfeed, Enramycin +ZnO and Butyrate, respectively, 42, 21, 18 and 29.

There was no impact of the treatments on rare taxons nor on the relative abundance of the taxonomic groups (uniformity), nevertheless Tanfeed promoted an increase of *Brevibacillus* spp and *Enterococcus* spp. genus compared with all treatments ($P<0.05$). Tanfeed did not compromise or improve the digestibility coefficients of dry matter, crude protein, mineral matter and gross energy of the rations, behaving similarly to the other treatments.

Discussion and Conclusion

The performance data and the occurrence and intensity of diarrhea are in agreement with (1) and (2) that deal with the effectiveness of tannin in improving zootechnical results and in controlling diarrhea. These benefits can be supported by the modulation which *Brevibacillus* and *Enterococcus* determined (4;5). Condensed tannin can replace zinc oxide in nursery rations, improving the performance and intestinal health.

1. Carega, MFCS; Dantas, A. Rev. Nucleus Animalium, 2017. DOI 10.3738/21751463.1831; 2. Manella, M; Cidrini, IA. ANAIS Tema: Eficiência Produtiva e Impacto Ambiental na Produção de Ruminantes, Uberlândia, Brasil, 2018; 3. Caprarulo, V et al. Animals, 2020, DOI: 10.3390/ani10111945; 4. Liao, SF, Nyachoti, M. 2017. Anim. Nutr. <https://doi.org/10.1016/j.aninu.2017.06.007>; 5. Sun, J et al. 2019. Sci. Rep. DOI 10.1038/s41598-019-55328