FEED/FODDER

NPARR 3(3), 2012-0254, Effects of the dietary incorporation of untreated and white-rot fungi (Ganoderma resinaceum Boud) pre-treated olive leaves on growing rabbits

The aim of this study was to evaluate the effects of the level of inclusion of olive leaves and its pre-treatment with Ganoderma resinaceum Boud on growth performance, nutrient digestibilities and caecal fermentation. A total of 48 rabbits were kept in individual cages and divided in 4 groups of 12 animals. Animals were fed ad libitum with one of four diets based on a basal feed for growing rabbits: Control diet (basal feed without olive leaves; OL0), basal diet with 50g/kg or 100g/kg of olive leaves (OL5 and OL10), and a basal diet with 50g/kg of G. resinaceum pre-treated olive leaves (OL5F).

The inclusion of olive leaves (OL0 vs. OL5 and OL10) had no effect on growth performance or feed intake. However lower feed intakes (P=0.038) were measured at 100g/kg of inclusion when compared to 50g/kg level of inclusion. Organic matter, neutral detergent fibre, crude fat and crude protein digestibilities were lower (P<0.05) for diets with the inclusion of olive leaves (OL0 vs. OL5 and OL10). Although the caecal volatile fatty acid (VFA) concentration was not affected by treatments there was an increase in caecum dry weight contents (P=0.004) in animals fed diets with olive leaves (OL0 vs. OL5 and OL10). Simple phenolics were completely removed by the pre-treatment with G. resinaceum and the concentration of flavonoids and iridoids were reduced by 85%. No effects of the pre-treatment with fungi (OL5F) were observed on the performance of growing rabbits compared to OL5 treatment. The pre-treatment with G. resinaceum increased (P=0.02) crude fat digestibility (0.829 vs. 0.886) and decreased (P=0.006) starch digestibility (0.987 vs. 0.973). Animals fed OL5F diet had lower caecum dry weight contents (−21%; P=0.002), higher caecal valeric acid concentration (+50%; P=0.046) and a trend (P=0.054) for a higher caecal acetic acid concentration (increase of 12%), compared with OL5 treatment.

This study showed that increasing amounts of olive leaves in the diet decrease nutrient digestibility. However, fungal treatment of olive leaves seems to alleviate the effect of olive leaves inclusion[4].

The effect of feeding lentil on growth performance and diet nutrient digestibility in starter pigs

The effects of substitution of soybean meal with increasing levels of green lentil (Lens culinaris) were evaluated in 240 starter pigs from 9 to 20 kg. Five pelleted wheat-based diets containing 0, 75, 150, 225, or 300g lentil/kg were formulated to contain 9.76 MJ net energy (NE)/kg and 1.20 g standardised ileal digestible lysine (Lys)/MJ NE and were fed for 3 weeks starting 2 weeks after weaning at 19 days of age. Lentil was added by replacing soybean meal and wheat and the diets were balanced for NE using canola oil and for amino acids using crystalline Lys, threonine, methionine and tryptophan. Increasing dietary inclusion of lentil linearly decreased (P<0.001) the diet apparent total tract digestibility coefficient for crude protein from 0.821 to 0.798 and digestible energy value from 14.4 to 14.0 MJ/kg. For the entire trial (day 0-21), increasing dietary inclusion of lentil linearly decreased (P<0.05) average daily gain (ADG) and quadratically reduced (P<0.01) feed efficiency (G: F). Specifically, pigs fed 75-225g lentil/kg had a similar ADG and G:F than pigs
fed 0g lentil/kg, whilst the inclusion of 300g lentil/kg reduced \( P<0.01 \) both ADG and G:F by 10%. Differences in feed intake were not observed \( P>0.05 \). In conclusion, inclusion of green lentil should not exceed 225 g/kg in diets for nursery pigs to maintain similar performance as pigs fed a diet with soybean meal as the main supplemental protein feedstuff [J.L. Landero, E. Beltranena and R.T. Zijlstra* (Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, Alberta T6G 2P5, Canada), *Animal Feed Science and Technology*, 2012, 174(1-2), 108-112].

NPARR 3(3), 2012-0256, Effects of energy level and *Leucaena leucocephala* leaf meal as a protein source on rumen fermentation efficiency and digestibility in swamp buffalo

Four Thai- rumen fistulated male swamp buffaloes (*Bubalus bubalis*), about 3 years old with 360 ±18 kg liveweight, were randomly assigned according to a 2×2 factorial arrangement in a 4×4 Latin square design to receive four dietary treatments. The treatments were as follows: a cassava based supplement (CS) at 1g/kg BW and *Leucaena leucocephala* leaf meal (LLM) at 300g/d (T1); CS at 2g/kg BW with LLM at 300g/d (T2); CS at 1g/kg BW and heat treated LLM (HLLM) at 300g/d (T3); and CS at 2g/kg BW and HLLM at 300g/d. During the experiment, urea-calcium hydroxide treated rice straw was given on *ad libitum* basis. The results revealed an increase in roughage and total dry matter (DM) intake \( P<0.05 \) by CS at 2g/kg BW (T2 and T4) as compared with CS at 1g/kg BW (T1 and T3). Digestion coefficients of DM, organic matter (OM), and crude protein (CP) were increased by CS at 2g/kg BW, while neutral detergent fiber (aNDF) and acid detergent fiber (ADF) were similar among treatments. However, there was no effect of neither energy level nor HLLM on ruminal pH and temperature \( P>0.05 \). Concentration of ruminal ammonia nitrogen \( (NH_3-N) \) was decreased by HLLM as compared with LLM \( P<0.05 \), while blood urea–nitrogen was not altered. There was an increase \( P<0.05 \) in total volatile fatty acid (TVFA), acetic acid (C2), propionic acid (C3), and butyric acid (C4) concentrations and the highest were found in CS at 2g/kg BW with HLLM (T4), while the lowest was in T1 and T3. However, no changes in C2–C3 ratio were found in this study. Total bacterial direct counts were found different \( P<0.05 \), whereas fungal zoospores and protozoal populations were similar among treatments. Nevertheless, viable bacterial counts were found affected by both concentrate level and HLLM. The treatments with HLLM were lower than those in LLM and CS at 2g/kg BW were higher than those supplemented at CS at 1g/kg BW \( P<0.05 \). In addition, efficiency of rumen microbial CP synthesis tended to be higher in treatment with higher level of energy and HLLM. Based on this study, it could be concluded that LLM could be used as a protein source, while the combination of HLLM and CS at 2g/kg BW could enhance the voluntary feed intake, nutrient digestibility and rumen fermentation in swamp buffalo fed on treated rice straw (urea–calcium hydroxide treatment) [S. Kang, M. Wanapat*, P. Pakdee, R. Pilajun and A. Cherdthong (Tropical Feed Resources Research and Development Center (TROFREC), Department of Animal Science, Faculty of Agriculture, Khon Kaen University, Khon Kaen 40002, Thailand), *Animal Feed Science and Technology*, 2012, 174(3-4), 131-139].