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Pretreatments of oil palm frond using pressing technique and enzyme extract from *Ganoderma lucidum* improve growth performance of goats

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Abstract

This study aimed to assess the effect of both physical and biological pre-treatments on oil palm fronds (OPF) using a pressing technique and an enzyme extract from *Ganoderma lucidum* on the growth performance of crossbred Boer goats. Thirty 5-month-old male goats with an average initial weight of 21.8±0.5kg were divided into five experimental groups. The dietary regimens included: Diet A, comprising 70% Napier grass and 30% concentrate(CON); Diet B with 50% Napier grass, 30% concentrate, and 20% untreated OPF(UNT); Diet C containing 50% Napier grass, 30% concentrate, and 20% OPF subjected to physical pretreatment via a sugarcane pressing machine(POF); Diet D with 50% Napier grass, 30% concentrate, and 20% OPF pre-treated biologically using enzyme extract from white rot fungi(BOF); and Diet E consisting of 50% Napier grass, 30% concentrate, and 20% OPF subjected to both physical and biological pretreatments(COF). Over a 120-day feeding period, growth indicators were monitored, and faecal samples were collected for nutrient digestibility assessment. All goats remained in good health throughout the study. Following the trial, the goats were slaughtered to evaluate meat quality. Results revealed that POF, BOF, and COF diets had significantly higher ($p<0.05$) total dry matter intake (DMI) compared to UNT and CON diets. The goats fed with BOF exhibited the highest average daily gain. Furthermore, COF diet led to increased ($p<0.05$) digestibility of DM, crude protein, acid detergent fibre, and neutral detergent fibre by 13%, 9%, 13%, and 14%, respectively, compared to the Control. COF-fed goats also exhibited higher slaughter weights ($p<0.05$), although hot and cold carcass weights, dressing percentage, and meat quality parameters were unaffected by the pretreatments. In conclusion, the combined physical and biological pretreatments of OPF resulted in enhanced total DMI, nutrient digestibility, slaughter weight, and body weight gain in goats, while meat quality remained unchanged.

Keywords: oil palm frond, pressing method, enzyme extract, *Ganoderma lucidum*, growth performance, meat quality, goat