

## Effects of Supplementation with Guinea Grass Silage on Growth Performance of Lao Native Cattle Fed Rice Straw as Basal Diet

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### Abstract

The study was carried out to determine the effects of supplementation with guinea grass silage on growth performance of Lao native cattle fed rice straw as basal diet. The aims of this study were to analyze the chemical composition of rice straw (RS) and guinea grass silage (GGS) from Lao PDR, to evaluate ruminal degradation of rice straw and guinea grass silage from Lao PDR by *in vitro* gas production technique and nylon bag technique, and to evaluate effects of guinea grass silage supplementation on growth performance of Lao native cattle. The guinea grass was harvested at the same stage of maturity and chopped at 3 – 8 cm length. The guinea grass was compacted and maintained in an airtight seal for 21 days. The pH value was measured by pH meter. The volatile fatty acid (VFA) was extracted by distillation method. *In vitro* gas production technique and nylon bag technique were conducted in four (4) fistulated Thai native cattles fed napier grass *ad libitum* and concentrate 1 kg/d/head. The *in vitro* gas production and *in sacco* degradability were measured after 2, 4, 8, 12, 24, 48, 72 and 96 h. The microbial biomass yield (MBY) was examined for 24 h fermentations. The growth performance trial was conducted as a randomized completed block design (RCBD) with the 12 Lao native cattle. The cattles with 2 years old ( $130 \pm 29.6$  kg) have been blocked by sex into two blocks of four males and eight females. The basal diet was rice straw (RS) and supplementation of various levels of guinea grass silage (GGS) were used as treatments (3 cattle/treatment) as below: T1: RS fed *ad libitum* (Control), T2: RS fed *ad libitum* + 1 kg DM of GGS, T3: RS fed *ad libitum* + 1.5 kg DM of GGS and T4: RS fed *ad libitum* + 2 kg DM of GGS. The experiment was conducted for 153 days. The chemical composition of RS and GGS were analyzed by proximate analysis and detergent methods. Results showed that DM, OM, CP, EE, CF, NFE, NDF, ADF and ADL of RS and GGS were, 91.13% and 18.36%, 84.23% and 89.58%, 4.36% and 8.68%, 2.55% and 3.75%, 35.27% and 36.52%, 42.05% and 40.57%, 63.51% and 61.92%, 40.05% and 38.47%, 11.57% and 12.26%, respectively. The acetic acid, butyric acid, and lactic acid of GGS were 4.68%, 2.23% and 0.11% on dry matter basis, respectively. The pH value of GGS was 4.84. The gas production and the microbial production were not significant for RS and GGS ( $P > 0.05$ ). However, metabolizable energy (ME) and organic matter digestibility (OMD) were higher for GGS than RS ( $P < 0.05$ ). The DM degradability was higher for GGS than RS within 2, 4, 8, 12, and 48 h incubation ( $P < 0.05$ ), while no significant difference was found between GGS and RS at 72 and 96 h ( $P > 0.05$ ). The soluble fraction, (a) of RS was lower than GGS while insoluble fraction, (b) of RS was higher than GGS ( $P < 0.05$ ) but the rate of dry matter degradation, (c) was not significant for RS and GGS

( $P>0.05$ ). The cattle fed diet supplemented with 1.5 kg DM of GGS had highest ADG (0.25 kg/day) and lowest FCR (22.60) ( $P<0.01$ ). Feed intake of cattle fed 1.5 kg DM of GGS and 2.0 kg DM of GGS supplementation diets were significantly higher ( $P<0.01$ ) than control and the 1.0 kg DM of GGS.

It can be concluded that guinea grass silage had better nutritive values and higher digestion coefficient than rice straw. Lao native cattle fed only RS *ad libitum* had lower feed intake than RS supplemented with GGS. Moreover, cattle fed 1.5 kg DM of GGS supplementation had better growth rate and feed conversion ratio than those fed control and 1 kg DM of GGS, 2 kg DM of GGS supplementation.