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Effect of Dried *Elaeis guineense* Supplementation to Basal Hay Diet on Energy and Protein Metabolism of West African Dwarf Sheep

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Abstract

Considerable attention has been focused on the use of multipurpose trees as feed supplement for small ruminant during dry season. Multipurpose trees provide a cheap source of protein supplement during the dry period, when both the quantity and quality of pasture herbage is limited. Few experiments with nitrogen and energy balances have been performed with poultry, pigs and sheep, but information on nitrogen and carbon balances with Djallonke sheep are very scanty in literature. It was against this background that the effect of anti-nutritional factors (condensed tannins) in *Elaeis guineense* on quantitative energy and protein retention as well as utilisation in West African Dwarf (WAD) sheep was investigated. Twelve castrated WAD sheep averaging (22.0 ± 2.1 kg BW) were used in nitrogen and energy balance trials. Dried leaves of *E. guineense* were offered as supplement at two levels 25 % (diet 2) and 50 % (diet 3) of dry matter intake (DMI), replacing hay in the basal hay diet. The basal hay diet without supplementation was the control. Measurements were performed by means of nitrogen and carbon balances and with the use of indirect calorimetry. The digestibility and utilisation of protein were influenced ($p < 0.05$) by supplementation. Metabolisability of energy (ME/GE) was on the average 42.9 (SEM 3.9) % being significantly ($p < 0.05$) different among treatments. Protein digestibility decreased linearly ($p < 0.05$) with supplementation. Protein retention and utilisation showed that supplementation led to a negative balance. A significant ($p < 0.05$) decrease in heat loss (709 kJ day $^{-1}$) was observed at the higher level of supplementation. The lowest ($p < 0.05$) heat loss was observed in diet 2 which amounted to 45 % of total energy intake, giving rise to a loss of 8.4 % of the energy retained in fat and protein by these animals. It was concluded that *Elaeis guineense* is a plant of low fodder value especially when fed as dry feed, no wonder it is fed fresh in most parts of West Africa.

Keywords: *Elaeis guineense*, energy, fat utilisation and retention, protein, WAD sheep

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