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Pen-Fed *versus* Grazing: The Potential of Forages for Cattle Production in North-Eastern Cambodia

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Abstract

Due to conversion of grassland and forest into cropland, rubber and oil palm plantations, smallholder cattle farmers in the Ratanakiri Province, Northeast Cambodia, need to cope with decreasing grazing resources for their animals and with increasing land conflicts. The objective of this study was to evaluate if cultivated forages have the potential to contribute to cattle feeding in order to compensate the loss of grazing areas.

Above-ground biomass yields of cultivated forages (*Brachiaria ruziziensis*, *B. ruziziensis* × *B. decumbens* × *B. brizantha*, *Panicum maximum*, *Paspalum atratum*, *Stylosanthes guianensis*) in Pruok (E 106°96', N 13°57') were determined destructively during the rainy season between June and September 2015. Samples of forages were analysed for their nutrient and energy concentrations. Furthermore, average daily gain (ADG) of cattle pen-fed on cultivated forages (n = 16) was compared with that of animals grazing on native grasslands and in forests (n = 19) on five different smallholdings. Initial bodyweight of the local cattle was 122 ± 33 kg. Pen-fed animals consumed on average 3.9 ± 0.2 kg dry matter (DM)/day. Intake of the grazing cattle was not measured. Live weights were recorded fortnightly for 14 weeks.

Above-ground biomass yields of cultivated forages ranged between 2 and 3 t DM ha⁻¹ month⁻¹ with average crude protein, neutral detergent fiber and metabolisable energy concentrations of 84 ± 32 g kg⁻¹ DM, 647 ± 48 g kg⁻¹ DM and 7.3 ± 0.4 MJ kg⁻¹ DM, respectively. The ADG was 79 and 241 g day⁻¹ in pen-fed and grazing cattle, respectively (*p* < 0.01).

Sufficient forage amounts were supplied to pen-fed cattle, however, the predominant forage was *P. atratum*, a low quality forage. Therefore, the differences in ADG are likely due to variations in nutrient composition between cultivated forages and natural biomass. Under grazing conditions in the rainy season, cattle may select more nutritious biomass. Thus, feeding cultivated forages may not substitute grazing as management practice during the rainy season. However, with decreasing access to grazing land or during the dry season, the use of cultivated forages as an option for pastures or for conservation merits further study.

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