Effect of Different Drying Method and Maturity of Mulberry (*Morus alba*) Hay on *In Situ* Degradability of Sheep

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ABSTRACT

The experiment was conducted to elucidate the characteristics of the mulberry hay with respect to *in situ* degradation of dry matter (DM) and crude protein (CP). Four types of diets were used in the study differentiated by the drying methods and maturity of mulberry. These are, Mulberry harvested at 5 weeks of age and oven-dried (MHO5); Mulberry harvested at 7 weeks of age and oven-dried (MHO7); Mulberry harvested at 5 weeks of age and sun-dried (MHS5); Mulberry harvested at 7 weeks of age and sun-dried (MHS7). Samples (MHO5 and MHO7) were dried in the oven at 60°C for 48 h. Meanwhile, samples (MHS5 and MHS7) were directly dried in the sun until they reached a constant weight. Three rumen-fistulated mature sheep of 2.5 to 3 years old and average weighed 37±2.0 kg were used in this experiment. The sheep were kept in individual pens and fed twice daily in equal meals at 09:00 and 17:00 h and free access to water. The diet of the animals consisted of 30% mulberry hay (DM basis) and 70% of oil palm frond (OPF) (DM basis). The DM degradation of MHO5 and MHS5 was significantly ($P<0.05$) higher than MHO7 and MHS7 at 12, 24, 36 and 48 h of rumen incubation**.** Meanwhile, the CP degradation of MHO5, MHS5, MHO7 and MHS7 was not significantly ($P>0.05$) different at 0, 6, 12, 24, 36 and 48 h of incubation. The degradability of water insoluble (b), potential degradability (PD) and effective degradability (ED) of DM of MHO5 and MHS5 were higher than MHO7 and MHS7. Meanwhile, the PD and ED of CP were significantly ($P<0.05$) decreased with advancing plant maturity. These suggest that mulberry hay of five weeks maturity more fermentable and large potential for feeding sheep.

Key word: mulberry hay, degradability, maturity, sheep

INTRODUCTION

Mulberry hay of five weeks maturity contained higher CP and lower cell wall and lignin content than of seven weeks (Ali *et al.*, 2007). The nutritive value of forage could be predicted from their degradation characteristics as they are strongly correlated to voluntary intake as compared to *in vivo* or chemical composition (Tolera and Sundstol, 2001).

Accurate estimation of the nutritive value of feed is important in animal production. The *in sacco* or nylon bag technique is commonly employed to estimate the degradation characteristics (Nordkvist *et al.*, 1987) in particularly of protein and roughages and also for rumen environment studies (Ørskov and Shand, 1997). The bag technique is also a very robust and powerful tool to study several other aspects of nutrition in ruminants. The degradation characteristics of feeds, determined by the *in sacco* method, could be used in the predictions of feed intake, digestibility and animal performance in terms of growth rate (Orskov and Ryle, 1990).

Studies on the degradation characteristic of fresh mulberry have been of great interest. Schmidek *et al.* (2002b) reported that mulberry leave showed high values of the soluble and potentially degradable fraction as well as the potential and effective degradation. It shows that mulberry foliage has a considerable potential for feeding ruminant.

The objective of this experiment was to elucidate the characteristics of mulberry hay with different drying and maturity respect to the *in situ* degradation of DM and CP.