PRODUCTION OF A GOOD QUALITY SILAGE FROM CROP RESIDUES

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Introduction

The use of crop materials in silage production has been adopted in many countries as a method for animal feed preservation. Silage making is less weather dependent and well adapted to a wide range of crops. It has been estimated that 18 million tonnes of dry matter of pruned fronds are available annually as crop residues. These materials, such as nipah (*Nipa fruticans*) and oil palm (*Elaeis guineensis*) fronds have the potential use as feed materials for ruminants after certain processing such as ensiling. Earlier studies by Shamsuddin et al. (1995) have shown the improved nutritive value of oil palm fronds after ensiling. Since silage production from these crop residues is not well understood, a detailed comprehensive studies is required to improve the process and the quality of the silage produced.

Materials and Methods

Nipah (NF) and oil palm (OPF) fronds were chopped (10-15 cm long) mechanically and packed separately in 10 kg batches in plastic bags. Each bag was placed in a bucket and the materials compressed manually to exclude as much air as possible. The bags were tied and the buckets sealed and left under shade. A total of 42 bags was prepared. Samples of fresh fronds and silage at 2-day intervals during the first two weeks and thereafter at regular intervals for three months were obtained for the determinations of pH and chemical composition (in triplicates). Temperature was measured *in situ*. The chemical composition (proximate analysis), the buffering capacity and the concentrations of soluble sugar, volatile fatty acids and organic acids were determined. The effects of adding 3 % urea and molasses at various concentrations (10, 20, 30%) on the quality of silage was also investigated.

Results and Discussion

Fresh NF and OPF contained 4.7 and 5.3% crude protein, 64 and 76 % neutral detergent fibre, 4.6 and 3.3 mg/g soluble sugar, 10 and 5% ash, respectively. Initial pH was 4.2 for both fronds. During ensiling, pH for nipah was significantly ($P<0.05$) higher than that of OPF. pH value for NF increased to 5.3 at 30 d, while the value for OPF was maintained around 4.3. The high pH value observed for NF indicates a poor ensilability as a result of lower concentration of lactic acid (0.7 g/kg dry matter) when compared to that of OPF (1.5 g/kg dry matter). Lactic acid production was considered low when compared to that of grass or maize silage (53-59 g/kg dry matter) The buffering capacity was also significantly ($P<0.05$) higher in NF (78.3 meq/100g) than that of OPF (58.3 meq/100g). The addition of molasses at 10 and 20 % (100g and 200g/kg dry matter, respectively) and urea (30 g/kg dry matter) did not improve the quality of NF silage. Lactic acid production was enhanced only in OPF with the addition of molasses. The addition of urea to both fronds resulted in higher pHs values (7.2-7.6). However, the addition of molasses at 30 % improved the quality of silage produced from NF where pH values and lactic acid production were similar to that of OPF silage.

Conclusions

It can be concluded that OPF produced a better silage than NF with or without the addition of molasses. However, the quality of silage produced from NF was comparable to that of OPF after the addition of 30 % molasses.

References

Shamsuddin, A.B., Shafit, H.M. and Bilal, I.R. 1995. Utilisation of oil palm frond and sago based rations for finished swamp buffaloes. Proc. Malaysian Society Animal Production. p 104-105.

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