Use of Dehydrated Sugar Cane (Saccharum officinarum)as an Additive to Napier Grass (Pennisetum purpureum) Ensilage

José Neuman Miranda Neiva,
Ana Cristina Holanda Ferreira, Maurício Teixeira

Federal University of Ceará, Caixa Postal 12168,
Fortaleza-CE, Brazil CEP: 60355-970
E-mail: zeneuman@ufc.br

1. Introduction

Tropical grass biomass increases with maturity, but decreases in nutritive value. To overcome this problem these grasses are frequently ensiled at an early growing stage. However, young plants have a high moisture content, high buffering capacity and a low level of soluble carbohydrates. According to Woolford (1984), these factors have a negative influence on the fermentatioin process, preventing a rapid lowering of the pH and thus allowing unwanted secondary fermentation, consequently damaging the quality of the final product.

Assuming that the above problems are the main limitations to the ensilage of Napier grass, research was undertaken with the objective to find practical solutions to enable the production of good quality silage from the Napier grass.

Amongst the existing alternatives, the addition of dehydrated sugar cane to the Napier grass to be ensiled appears to be

interesting, because it has high contents of dry matter (DM) and water soluble carbohydrates (WSC).

The aim of this study was to evaluate the chemical and fermentation characteristics of the Napier grass silage with different levels of added dehydrated sugar cane.

2. Materials and Methods

This experiment took place at the Forage Section of the Federal University of Ceará. The chemical and fermentation characteristics of Napier grass silage with the addition of 0, 5, 10 and 15% of dehydrated sugar cane on a fresh matterial basis. The Napier grass biomass, aproximately 80 days old, was chopped and mixed with the dehydrated sugar cane. The sugar cane was ground in a mill fitted with 3mm sieves. A replicated, completely randomised design was used.

We used polyethylene laboratory silos with a 100 mm diameter and 340 mm depth. Sixty days after filling, the silos were opened and homogeneous samples of aproximately 300 g were taken to determine DM, crude protein (CP), pH and $N\text{-}NH_3$. Analyses of variance and regression were used to test the data.

3. Results and Discussion

The DM content of the silage increased linearly with the addition of dehydrated sugar cane (Table 1). Almeida *et al.* (1986) and Tosi *et al.* (1989), studying the addition of sugar cane and sugar cane bagasse, respectively, in the ensilage of Napier grass, also observed a rise in the DM levels.

Table 1: Average value of the levels of DM, CP, ammoniacal nitrogen (N-NH_3), pH and regression equations

Parameter	Sugar cane				Mean	Regression Equations
	0%	5%	10%	15%		
% DM	21.2	25,2	27,5	29,9	25,9	Y=25,9465+2,8442x R^2 =98,05%
% CP	7,3	5,7	5,6	4,9	5,9	Y=5,8895–0,6954x R^2 = 99,25%
N-NH_3	4,6	3,9	4,9	4,4	4,5	NS
pH	3,6	3,6	3,6	3,7	3,6	NS

CP levels decreased linearly with the addition of dehydrated sugarcane. Similar results were obtain by Almeida *et al.* (1986). Tosi *et al.* (1989), using sugar cane bagasse as an additive in Napier grass ensilage observed that the CP level of the silages fell below 4%. This reduction is explained by the very low CP concentration of sugar cane bagasse (ca 2%)

We have not observed significant differences in N-NH_3 and pH value between the silages. The quality of the silage without sugar cane was as good as that with. Almeida *et al.* (1986) and Tosi *et al.* (1989) also found that wilted Napier grass made well-preserved silage without sugar cane or bagasse.

Conclusions

From the data obtained on this study we can conclude that the addition of dehydrated sugar cane did not change the characteristics of the fermention of the silages, but reduced its CP levels.

As the CP reached very low levels with the addition of the sugar cane, further studies need to take place to test the inclusion of a nitrogen source together with sugar cane.

References

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