

## THE PRODUCTION OF SILAGE FROM SUGAR CANE TOPS AND ITS USE AS FODDER FOR CATTLE

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Silage from cane tops was prepared on a commercial scale using as additives ammonium sulphate and molasses at 5 or 1% respectively. The silage was compared to fresh fodder in a feeding trial carried out on 2 sites. The feeding level was approximately 3% of liveweight (fresh basis). The rest of the ration consisted of molasses with 3% urea fed at approximately 2.5% of liveweight, and a daily supplement of copra cake 1 kg, fish meal 200 g, and rice bran 500g. On Site 1, daily gain was 671 g and 751 g, and on Site 2, 566 g and 580 g for silage and fresh fodder respectively, the differences being non-significant. The results suggest that the production and utilization of cane tops silage should be considered in Mauritius.

Keywords: Cattle, Sugar Cane Tops, Silage

Owing to the seasonal nature of sugar production, sugar cane tops are available for use as fodder during only six months of the year. As fodder production from pasture is limited in Mauritius, there has been an interest in the production of silage from cane tops for use during the intercrop period. Laboratory experiments have shown that silage of good chemical quality could be made with the addition of molasses and ammonium hydroxide (Deville and Wong You Cheong 1978a). Also the dry matter digestibility and rumen fermentation pattern did not differ when goats were fed either cane tops or cane tops silage (Deville and Wong You Cheong 1978b). It was therefore decided to prepare silage on a commercial scale with a view to testing it in a feeding trial under feedlot conditions.

### Materials and Methods

**Preparation of Silage:** Silage was prepared on two sites, Mon Desert Mon Tresor (Site 1) and St Antoine (Site 2), a 200 ton capacity concrete silo being utilized at each site. At Site 2, the silo already existed, whilst at Site 1, it had to be constructed for the experiment.

Cane tops were chopped to an average of 2 cm. Additives used were: molasses at 5% and ammonium sulphate at 1% of the total fresh material. Ammonium sulphate was used as the nitrogen additive, being more convenient for use on a large scale than ammonia solution. It has been established that silage prepared with either nitrogen source did not differ much in chemical quality (MSIRI unpublished results). The silage was kept for three months before the trial started.

*Analytical Methods:* Chemical analysis of the silage was carried out as described by Deville and Wong You Cheong (1978a).

*Treatments:* Two feeding trials were carried out, one at each site. On both sites, two groups of animals were used, there were 15 and 20 animals per group on Sites 1 and 2 respectively. One group received silage and the other fresh fodder which was either elephant grass or fresh cane tops, depending on the availability. Fodder and molasses containing urea at 3% were each fed at about 3% of liveweight. The remainder of the ration was the same for both groups of animals (Table 1). The animals at Site 1 were permanently in a feedlot with a concrete slatted floor, while those at Site 2 were in a bare soil enclosure. At Site 1, the animals were of the Creole type, while at Site 2 they were of the local Zebu type. The animals were weighed individually at the start of the trial and then at monthly intervals. The trial lasted 232 days at Site 1 and 149 days at Site 2. No replication was possible owing to lack of facilities.

Table 1 :  
Composition of the daily supplementary ration, kg/animal

Copra cake	1.0
Fish meal	0.2
Rice bran	0.5
Dicalcium phosphate	0.1
Common salt	0.1

Statistical analysis of daily liveweight gains was performed by the "t" test. Two animals on the fresh fodder at Site 1 were not considered as they had to be sold before the end of the trial because of leg injuries.

### Results and Discussion

The results of analysis of the silages are given in Table 2. There was some spoilage at the front and at the sides of the silos amounting to about 5% of the total silage. At both sites the pH was less than 4.0, thus indicating good conservation. Table 3 compares the criteria proposed by INRA (Anon 1977) for the evaluation of silage quality with the analytical data obtained for the silages produced in this experiment. It can be observed that the silages made at both sites were of "good" quality, according to these criteria.

Mean values for animal performance and feed intake are given in Table 4. Although at Site 1, fresh fodder gave higher daily gains than silage, the difference was not significant. There was little difference at Site 2 as a result of forage type, the lower overall animal performance compared to the animals at Site 1 being ascribed to the fact that the feedlot conditions were not as good as at Site 1. In fact, the trial had to be stopped there after 149 days due to the accumulation of animal waste and mud. Furthermore local Zebu type animals were used at Site 2 and these are known to perform less well than Creole type animals (Poillot et al 1976).

Although replications were not possible in this experiment, some interesting observations were made. It was shown that cane tops silage

Table 2:  
Analysis of silage (mean values)

	Mon Desert Mon Tresor	St Antoine
pH	3.6	3.7
Dry matter, %	26.6	29.6
Alcohol, % DM	0.6	0.3
Ammonia-N, % DM	0.09	0.7
Lactic acid, %DM	5.5	4.3
Total VFA mM, %DM	30.4	37.8
Molar ratios, %		
Acetic	80.9	84.9
Propionic	8.6	11.5
Butyric	0.7	3.6

Table 3:  
Comparison of the analysis of cane tops silage with the criteria  
proposed by INRA for evaluation of silage quality

	VFA mM/kg DM	Acetic g/kg OM	Butyric g/kg DM
INRA quality rating			
Excellent	300	20	0
Good	300 - 600	20 - 35	5
Satisfactory	600 - 900	35-50	5
Mediocre	900 - 1200	50 - 65	5
Very bad	1200	65	5
Cane tops silage			
Site 1	304	14.7	0.2
Site 2	378	19.6	1.2

produced reasonable liveweight gains, when fed with supplements of moderate nutritional value. These gains in fact compared well with those generally obtained under commercial conditions in this country using fresh forage, and it is therefore reasonable to suggest that cane tops silage can be prepared and used as a substitute fodder without affecting animal performance. Further information should be obtained on the performance of improved beef animals and dairy cows when fed cane tops silage. However, since cane tops represent the only fodder available in large

Table 4:  
Liveweight change and feed intake of animals fed either cane tops silage or fresh fodder

	Site 1				Site 2			
	Silage	Fresh fodder	SE-x	Sig.	Silage	Fresh fodder	SE-	Sig.
Initial wt, kg	185.8	186.7	-	-	151	168	-	-
Final weight, kg	341.4	360.9	-	-	236	255	-	-
Duration, days	232	232	-	-	149	149	-	-
Daily gain, g/d	671	751	41	NS	566	580	21	NS
Daily feed intake, kg fresh material								
Fodder	8.6	7.8						
Molasses	6.9	6.9						
Urea	0.2	0.2			Not available			
Copra cake	1.0	1.0						
Rice bran	0.5	0.5						
Fish meal	0.2	0.2						

quantities, large scale silage production should be seriously considered if Mauritius is to be self sufficient in meat and milk.

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