

A NOTE ON ENSILING CHARACTERISTICS OF THE TROPICAL GRASS

Setaria sphacelata var. *splendida* (Stapf)

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1. INTRODUCTION

A large proportion of livestock in tropical countries live on arid and semi-arid regions that provide abundant, palatable natural or improved pastures in rainy season and very poor feed resources during dry season and occasional prolonged droughts. Therefore, one of the major constraints to animal production in the tropics is the inadequate feeding of animals in those periods of time.

To minimise this problem, part of the pastures should be cut during the good quality stage and preserved as hay or silage.

The objective of this study was to evaluate the ensiling characteristics of *Setaria sphacelata* var. *splendida* (*S. splendida*) and to identify ensilability limiting factors of this tropical grass, locally produced.

2. MATERIALS AND METHODS

S. splendida was submitted to nitrogen fertilisation and was weekly irrigated. Harvest was conducted at a medium height of 100 cm.

Previous experiments conducted in this laboratory proved that silages obtained from *S. splendida* green material were of poor quality. Therefore, all raw material used in this study was submitted to a 24 h pre-wilting treatment, followed by chopping, treatment according to different treatments (Table 1) and ensiling in 10 kg capacity laboratory scale silos during 90 days.

TABLE 1. ADDITIVES USED AT THE DIFFERENT TREATMENT SCALE

	Designation	Dose
Treatment 1	Pre-wilting (PW)	24 hour
Treatment 2	PW + ADD-F [®]	4 ml/kg FW
Treatment 3	PW + Ecosyl [®]	7.5 mg/kg FW
Treatment 4	PW + Kem Lac Dry [®]	10 mg/kg FW
Treatment 5	PW + Pioneer 1188 [®]	3.33 mg/kg FW
Treatment 6	PW + Molasses	50 g/kg FW (1:1 dilution)

Four laboratory silos were used for each treatment and results obtained were statistically submitted to analysis of variance (Steel and Torrie, 1980).

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3. RESULTS

Statistical difference ($P \leq 0.05$) between treatments (Table 2) showed that Treatment 1 (T1) gave inferior results when compared to the others. Treatment 6 (T6) gave the best results and produced very good quality silages. Treatments 3, 4 and 5 (T3, T4, T5) gave good results as well, results which could have been more significant should the water soluble carbohydrate content of the pre wilted grass be superior. Treatment 2 (T2), although giving better results than T1, resulted in production of silages inferior in quality to those obtained in the other treatments.

TABLE 2. RESULTS AND STATISTICAL DIFFERENCE BETWEEN TREATMENTS (*)

	PWgrass	T1	T2	T3	T4	T5	T6	Sig.
Total LAB (log cfu/g FW)	4.69	9.78	9.61	9.34	9.93	10.06	8.47	NS
Clostridia (log spore/FW)	2.90	0.00a	1.90b	0.50ab	0.00a	0.00a	1.00ab	*
Yeasts/moulds (log cfu/g FW)	5.14	4.01ab	4.48b	2.27a	2.30a	3.19ab	4.77b	*
Dry matter (DM) (%FW)	29.10	27.12	27.37	27.87	27.12	27.75	28.12	NS
pH		4.64c	4.35bc	4.08b	3.98ab	4.04ab	3.62a	*
WS Carbohydrates (%DM)	4.02	0.66ab	1.79bc	0.61a	0.60a	0.58a	2.06c	*
Starch (%DM)	1.08	0.50	1.07	0.55	1.58	1.75	1.21	NS
Total nitrogen (TN) (%DM)	1.38	1.29	1.13	1.00	1.28	1.21	1.13	NS
Soluble nitrogen (%TN)	40.80	35.60	47.47	58.35	46.52	47.47	54.17	NS
N-NH3 (%TN)		10.85	9.47	11.70	6.12	7.67	4.50	NS
NDF (%DM)	60.49	57.14	52.44	54.16	56.57	54.01	53.15	NS
ADF (%DM)	39.23	35.62	33.17	33.98	34.86	34.57	33.45	NS
Ashes (%DM)	13.69	11.56ab	10.64a	11.03ab	11.43ab	10.96ab	13.10b	*
Lactate (%DM)		1.85a	1.80a	3.46ab	3.90b	3.68ab	6.39c	*
Acetate (%DM)		0.68	0.37	0.56	0.51	0.66	0.51	NS
Propionate (%DM)		0.01	0.04	0.01	0.02	0.03	0.02	NS
Butyrate (%DM)		0.04a	0.11b	0.02a	0.04a	0.03a	0.02a	*
Ethanol (%DM)		0.38ab	0.33ab	0.17a	0.63ab	0.26ab	0.69b	*
Propanol (%DM)		0.003ab	0.012b	0.004ab	0.001a	0.002ab	0.001a	*
Butanol (%DM)		0.003a	0.011b	0.001a	0.000a	0.000a	0.000a	*
IVDM digestibility (%)	52.70	49.92a	52.07a	52.17ab	52.30ab	52.20ab	56.00b	*
IVOM digestibility (%)	49.70	41.68a	43.95ab	44.35ab	44.95ab	45.92b	53.10c	*

(*) - Means in the same row not followed by the same letter, differ significantly ($P \leq 0.05$).

4. CONCLUSION

Present results have proved that, if the limiting factors of the tropical grass *S. splendida* which affect the production of good silages are taken into account, by implementing special ensilage techniques, it's possible to reduce the chances of obtaining bad quality silages.

5. REFERENCES

STEEL, R; J. TORRIE (1980). *Principles and procedures of Statistics. A biometrical approach*. McGraw-Hill, New York.