

## **Nutritional values of Tifton 85 grass silage with or without pre-drying under the sun**

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**Introduction** The silage of tropical forages, when correctly carried out, may represent a promising alternative to preserve surplus forages and its supply to animals during shortage terms. However, some factors should be considered in order to produce high quality silage as dry matter (DM) of material to be ensiled, which must vary from 30 to 35% (McDonald et al., 1991). Thus, the work studied the chemical composition of silage obtained from a Tifton 85 grass submitted or not to pre-drying under the sun in order to increase DM contents.

**Material and Methods** The experiment was carried out in Marechal Cândido Rondon city, Paraná, Brazil (24° 33 '40"S, 54° 04' 12"W). Tifton 85 grass was harvested at 32 days of regrowth in an area for hay and silage production, using a forage harvester tractor-implement, Tarupe model, with the following composition: 15.2% crude protein (CP), 68.4% of neutral detergent fiber (NDF), 36.0% acid detergent fiber (ADF), 32.4% hemicellulose, 9.63% mineral (M), 35.0% acid detergent insoluble protein (ADIP). Plants were harvested at 5cm height from soil and chopped into particles of about 5 cm. For dehydration, part of the chopped forage was put under the sun for two hours on clean canvas, so that a 10cm layer in height was formed and revolved twice at every 45 minutes. During ensilage, the chopped Tifton 85 presented 26% DM, while the Tifton that was pre-dried under the sun presented 32.1% DM. The experimental design was a completely randomized in a 2x3 split-plot design with two conditions submitted to Tifton 85 silage (with and without pre-drying under the sun), and three periods of silo opening (28, 56 and 112 days after ensilage), totaling 36 experimental units, represented by experimental silos made of PVC pipes with 50 cm high and 10 cm diameter. An amount of 1.700 and 1.500 kg of Tifton 85 grass was stored in each silo, with and without pre-drying under the sun, respectively. The material was compacted and silos were lid with caps equipped with Bunsen valves to let gases escape. At silos opening, a sample of the material was taken to determine CP, NDF, ADF, hemicellulose, MM and ADIP.

**Results and Discussion** Data for CP, NDF and hemicellulose showed a significant effect concerning the periods ( $P < 0.05$ ), but there was no significant answer for the presence or absence of pre-drying ( $P > 0.05$ ). There was a significant interaction among factors for ADF contents ( $P < 0.05$ ), while, MM, ADIP and hemicellulose were not affected by studied sources of variation ( $P > 0.05$ ). CP contents decreased according to the periods of evaluation. Thus, the lowest answers were found in silages at 56 and 112 days of silos opening in relation to the ensiled material (Table 1). The same behavior was observed for NDF and hemicellulose, but with greater reductions. The ADF was higher in silage from Tifton 85 submitted to pre-drying at 56 days after ensiling. The results are consistent when compared to the ones found by Tosi et al. (1995) and Evangelista et al. (2000), who observed no effect of wilting on CP content of tropical grasses. Castro et al. (2006) also observed reductions on NDF levels at late opening of silos. The results are consistent with ADIP for Umaña et al. (1991), who also observed no change on ADIP silage content in relation to pre-wilting. This result shows that there was an overheating of Tifton 85 during dehydration, so, some indigestible compounds were produced due to Maillard reaction (Evangelista et al., 2004).

**Conclusion** The Tifton 85 grass can be ensiled with or without pre-drying under the sun without causing any problem to the nutritional values of silage. However, it must be consumed before 56 days after ensiling.

## References

- Castro, F.G.F.; Nussio, L.G.; Haddad, C.M.; Campos, F.P.; Coelho, R.M.; Mari, L.J.; Toledo, P.A. 2006. Características de fermentação e composição químico-bromatológica de silagens de capim-tifton 85 confeccionadas com cinco teores de matéria seca. *Rev. Bras. Zootecn.*, 35:7-20.
- Evangelista, A.R.; Abreu, J.G.; Amaral, P.N.C.; Pereira, R.C.; Salvador, F.M.; Santana, R.A.V. 2004. Produção de silagem de capim-marandu (*Brachiaria brizantha* Stapf cv. Marandu) com e sem emurchecimento. *Ciênc. Agrotec.*, 28:443-449.
- McDonald, P.; Henderson, A.R.; Heron, S.J.E. 1991. *Biochemistry of silage*. 2.ed. Marlow, Chalcombe, 340p.
- Tosi, H.; Rodríguez, L.R.A.; Jobim, C.C.; Oliveira, M.D.S., Sampaio, A.A.M., Rosa, B. 1995. Ensilingem do Capim-elefante cv. Mott sob diferentes tratamentos. *Rev. Bras. Zootecn.*, 24:909-916.
- Umaña, R.; Staples, C.R.; Bates, D.B.; Wilcox, C. J.; Mahanna, W. C. 1991. Effects of the digestibility of bermudagrass ensiled at two moisture contents. *J. Anim. Sci.*, 69:4588-4601.

**Table 1.** Nutritional values of silage prepared with Tifton 85, submitted or not to pre-drying under the sun at the ensiling period and at three periods of silos opening

Periods	Chopped Pre-dry Means			Chopped Pre-dry Means			Chopped Pre-dry Means		
	CP			NDF			ADF		
Silage	15.36	14.78	15.07a	65.43	64.72	65.08a	30.11Aa	31.72Ab	30.92
28 days	15.01	13.98	14.49ab	57.78	59.11	58.44b	34.42Aa	33.55Ab	33.99
56 days	13.92	14.30	14.11b	57.54	58.70	58.12b	32.91Ba	38.07Aa	35.49
112 days	14.47	14.09	14.28b	52.14	53.60	52.87c	33.90Aa	33.19Ab	33.54
Means	14.69A	14.29A		58.22A	59.03A		32.84	34.13	
CV1 (%)	9.68			4.8			7.85		
CV2 (%)	4.34			5.92			6.42		
	Hemicellulose			M			ADIP		
Silage	35.32	33.00	34.16a	13.92	14.30	14.11a	22.25	21.97	22.11a
28 days	23.35	25.56	24.46b	14.47	14.09	14.28a	18.69	20.21	19.45a
56 days	24.63	20.64	22.63bc	13.89	13.92	13.90a	18.43	19.67	19.05a
112 days	18.24	20.42	19.33d	13.45	13.05	13.25a	18.69	20.83	19.76a
Means	25.39A	24.90A		13.93A	13.84A		19.51A	20.67A	
CV1 (%)	6.66			14.75			8.27		
CV2 (%)	17.46			7.75			16.70		

\* Means followed by the same uppercase letters in row and lowercase letters in column do not differ by Tukey test (5%). CP: crude protein, NDF: neutral detergent fiber, ADF: acid detergent fiber, MM: mineral, ADIP: acid detergent insoluble protein.