Nutritional value of Tifton 85 hay stored under two conditions

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Introduction Haymaking can be used when there is an extra production of forage, since it allows a balanced livestock management, whose nutrients showed good quality and greater stability throughout the year (Domingues, 2009). However, the changes that occurred during drying, collection and hay storage are crucial for chemical composition of preserved forage. Besides such information, there are few researches concerning changes during haymaking and its storage in Brazil (Jobim et al., 2007). Thus, the trial aimed to study changes on chemical composition of Tifton 85 hay, stored under two conditions.

Material and Methods The experiment was carried out in Marechal Cândido Rondon city, Paraná, Brazil (24º 33 '40"S, 54º 04' 12"W). The Tifton 85 hay was produced on field and baled after 96 hours of dehydration. During harvesting, sampling was performed in 12 randomized points in an experimental area to characterize plants, whose results are: plant height: 60 cm; number of leaves per plant: 6.8; stem base diameter: 1.32 mm; leaf length: 23.5 cm, leaf/stem ratio: 1.71; dry matter (DM): 28.3% DM yield: 6,899 kg ha^{-1}; crude protein (CP): 10.8%; neutral detergent fiber (NDF): 77.0% acid detergent fiber (ADF): 36.4% hemicellulose, 40.6%. The design was completely randomized in a 2x3 subdivided plots, with two storage conditions and three sampling times, with five replications. The storage conditions consisted of two sheds: the first one was an airy room/shed where hay was stored on wooden pallets and the second one was the field where hay was cropped, so the bales were placed on plastic canvas, directly on soil surface then covered with the same material. The samples were collected at the time of baling, as well as after 15 and 30 days of storage. Temperature values of each sample were obtained from bales and samples were collected to determine DM, CP, NDF, ADF and hemicellulose contents.

Results and Discussion Temperature and FDA levels were not affected by the environments or sampling times ($P > 0.05$). On the other hand, there was an interaction effect of DM, CP and NDF, while hemicellulose was changed only by sampling times ($P < 0.05$) (Table 1). The DM contents showed the same levels from the time of baling until 15 days of storage, but there was a decrease in both environments after this period and, at 30 days of storage, hay that was kept in field showed lower DM content when compared to hay stored in the shed. This result is related to the RH of the air, since at 30 days of hay storage, this answer was almost 90% and it should be considered that hay can absorb or lose water to the environment, thus, moisture contents of hay are affected by the environmental RH (Rotz and Abrams, 1988). There was an increase of CP levels when hay was stored in shed up from the moment of baling until 15 days of storage. After that, there was a decrease on those answers. On the other hand, CP contents were kept constant when hay was stored in the field. Due to this increase, at 15 days of storage, the hay stored in the shed showed higher CP levels when compared to hay stored in the field (Table 1). It was registered an initial increase of CP concentration in hay probably due to the loss of non-protein constituents (Rotz and Abrams, 1988), while changes during storage procedure followed the changes in DM contents (Nascimento et al., 2000). The NDF contents decreased with storage for hay stored in the field and these data are in accordance with the findings of Nascimento et al. (2000) and Neres et al. (2010), who observed a decrease in NDF content of alfalfa hay after storage. Hemicellulose also decreased with storage. Nevertheless, decreases for NDF and

hemicellulose levels were observed, but also expected, since according to Rotz and Abrams (1988), most of nutrients are not detected in hay within 30 days storage.

Conclusion The Tifton 85 hay can be stored in an airy shed or field, but protected with plastic canvas for 30 days without sudden changes in nutritional value, however, there will be some decrease in its dry matter content.

References

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Table 1. Temperature, dry matter content and nutritional value of Tifton 85 hay stored under two conditions at baling and at 15 and 30 days of storage

	Sampling Periods				Sampling Periods			
Environment	Baling	15 days	30 days	Mean	Baling	15 days	30 days	Mean
	Temperature (°C)				Dry Matter (%)			
Shed	32.80	29.70	27.20	29.90a	87.04aAB	90.14aA	83.95aB	87.04
Field	32.80	31.36	33.26	32.47a	88.79aA	92.23aA	73.99bB	85.00
Mean	32.80A	30.53A	30.23A		87.91	91.18	78.97	
CV1 (%)		24.17				6.48		
CV2 (%)		1.28				3.44		
	Crude Protein (%)				NDF(%)			
Shed	9.10aB	10.80aA	8.96aB	9.62	77.97aA	77.23aA	75.79aA	77.00
Field	8.52aA	9.53bA	9.45aA	9.17	79.47aA	76.24aB	74.65aB	76.79
Mean	8.81	10.17	9.20		78.72	76.73	75.22	
CV1 (%)		13.26				0.75		
CV2 (%)		7.87				2.23		
	ADF (%)				Hemicellulose (%)			
Shed	37.63	37.77	37.75	37.71	40.34	39.46	38.04	39.28a
Field	37.99	38.12	37.94	38.02	41.48	38.11	36.72	38.77a
Mean	37.81	37.95	37.84		40.91A	38.79AB	37.38B	
CV1 (%)		2.18				3.59		
CV2 (%)		3.73				4.97		

*Means followed by same uppercase letter on the row and lowercase letter on the column do not differ by Tukey test (5%).