Effect of ensilage on kinetic of ruminal degradation of elephant grass clones (*Pennisetum purpureun* Schum.)

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Introduction Elephant grass (*Pennisetum* sp.) stands as one of the most promising species for silage making. However, the low DM content at the age indicated to harvest may limit its use to silage making. The amount of WSC necessary to obtain adequate fermentation depends on the DM content and the buffer capacity of the crop (Oude Elferink et al., 2000). Ensiling of forages with low DM content leads to high WSC consumption by the silage microflora. In addition to the WSC loss, the ensilage may decrease protein by extensive proteolysis (McDonald, et al 1991). The aim of this work was to evaluate the effect of ensilage on kinetic of DM and NDF ruminal degradation of elephant grass clones (*Pennisetum purpureun* Schum.).

Materials and Methods Three clones of short height (Mott, IPA/UFRPE Taiwan A-146 2.27 and IPA/UFRPE Taiwan A-146 2.37) and two of high height (Elephant B and IRI 381) from Experimental Station of IPA – Itambé (PE) were evaluated. The crops were harvest at 70 days of growing, ensiled in PVC silos and stored for 120 days. To evaluate the effect of ensiling on DM *in vivo* ruminal degradation of the five clones, before and after ensiling, four adult sheep (40 kg of LW) fitted with permanent rumen fistula were used. Samples were weighed into 7 x 14 cm nylon fiber bags (28.6 mg DM/cm^2) and were suspended, in duplicate, for periods of 3, 6, 12, 24, 48, 72 and 96 hours in the rumen. An additional two bags per treatment, washed by procedure outline previously, were used for zero-hour. Washed nylon bags were dried (65ºC for 72 h) and the content of bag was subjected to NDF analysis (Van Soest et al., 1991). The exponential model of Ørskov and McDonald (1979) was used to compute the kinetic of DM and NDF degradation. A completely randomized design in a split-plot scheme with four replicates was used (clone on the plots and ensilage on subplot). Data were submitted to analysis of variance and means were compared by Tukey test at 5%.

Results and discussion The soluble fraction represents the fraction of the plant that is readily available to the rumen microorganisms, but the process of silage can change it. Elephant B and IRI 381 clones had decrease this fraction for DM (Table 1). IPA/UFRPE-Taiwan A-146 2.27 and IPA/UFRPE Taiwan A-2.37 clones did not alter the soluble fraction after ensilage. It is noteworthy that the ensiling can increase the soluble fraction, as occurred in this study with Mott clone. The rise in this fraction can be assigned to the higher CP, lower NH3-N and residual soluble carbohydrates content shown by Mott silage. There was no significant difference between the rates of degradation of *b* fraction (*c* parameter), for clones and ensiling effect. This fraction ranged from 1.16 to 4.15 for NDF and from 1.59 to 4.09 % per hour. According to Sampaio et al. (1995), rates of dry matter degradation less than 2% per hour indicate low quality food, since they require long time to be degraded in the rumen. For Mertens (1993), NDF degradation rates between 2% and 6% per hour are considered as good for forage of appreciated quality.

Conclusion The ensilage process causes greater impact on the soluble fraction in the rumen (*a* fraction) in Elephant B and IRI 381clones (high stature). However, the potentially degradable fraction in the rumen did not differ between the clones, regardless of stature, nor suffer action of the ensilage (when the process is well done).

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Table 1 Kinetic of DM and NDF rumen degradation of elephant grass clones and its silages

	a[1] (%)		b[2] (%)		c[3] (%/h)	
Iten	DM	NDF	DM	NDF	DM	NDF
Elephant B						
Fresh forage	31.28 Aa	7.48 Aa	46.71 Aa	66.38 Aa	2.22 Aa	2.19 Aa
Silage	16.90 Bb	0.92 Bc	49.61 Aa	57.61 Aa	1.59 Aa	1.51 Aa
IRI 381						
Fresh forage	25.68 Ab	7.48 Aa	49.25 Aa	50.46 Aa	4.09 Aa	1.94 Aa
Silage	22.20 Ba	5.47 Ab	42.02 Aa	66.69 Aa	3.49 Aa	1.16 Aa
IPA/UFRPE Taiwan A-146 2.27						
Fresh forage	23.23 Abc	4.04Ab	41.23 Aa	49.55 Aa	3.51 Aa	3.78 Aa
Silage	24.53 Aa	1.76Ac	47.58 Aa	53.60 Aa	3.69 Aa	3.08 Aa
IPA/UFRPE Taiwan A-146 2.37						
Fresh forage	22.68 Abc	8.97 Aa	43.44 Aa	58.93 Aa	2.02 Aa	2.62 Aa
Silage	22.15 Aa	11.46Aa	41.36 Aa	62.86 Aa	2.63 Aa	1.98 Aa
Mott						
Fresh forage	19.67 Bc	2.54 Ab	48.92 Aa	66.38 Aa	1.69 Aa	4.15 Aa
Silage	25.35 Aa	4.87 Ab	42.23 Aa	57.61 Aa	3.99 Aa	2.45 Aa
CV(%) clones	10.75	25.32	23.98	21.76	23.76	29.95
CV(%) ensiling	6.10	21.42	28.05	20.02	34.03	24.54

[1]Wash loss. [2]Degradability of water insoluble fractions. [3] Degradation rate of b fraction.

Values with different letters to the same variable, lowercase for clones and uppercase for ensiling, differ by Tukey test (5%)