

# Performance of beef cattle fed diets containing *Stylosanthes* and corn silages

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## Introduction

Reports of the use of tropical legumes in silage production are scarce as these legumes have high contents of crude protein, low water soluble carbohydrate and high buffering capacity, which inhibit the production of silages with good fermentation and nutritional characteristics. Recent research has, however, shown that it is possible to produce good quality silages using tropical legumes (Pereira *et al.* 2012). Souza *et al.* (2012) concluded that silage produced from *Stylosanthes* cv. Campo Grande (*Stylosanthes capitata* + *Stylosanthes macrocephala*) at 60% proportion of the dry matter of the diet can replace corn silage in diets for beef cattle in feedlots without altering their intake and productive performance. However, the ideal proportion of this silage in the diets for beef cattle is still unknown. Thus, the objective of this study was to evaluate the intake and performance of beef cattle fed diets with *Stylosanthes* and corn silages.

## Methods

The experiment was conducted at the “Central de Experimentação, Pesquisa e Extensão do Triângulo Mineiro” (CEPET), Federal University of Viçosa (UFV). Thirty-two Nelore cattle, with body weight of  $364.28 \pm 2.82$  kg, were distributed in a randomized block design with eight replicates. The animals were kept in individual stalls of 10 m<sup>2</sup>. The treatments consisted of diets with different proportions of *Stylosanthes* Campo Grande silage (StS):concentrate (C): 80:20, 60:40, 40:60, and a control treatment with 60% corn silage (CS) and 40% of C. The diets were isonitrogenous, with 12% crude protein (CP).

The CP content of the diet containing corn silage was adjusted to 12% by adding urea:ammonium sulfate (9:1) during the animals' feeding.

The experiment lasted 71 days, divided into two periods of 28 days each, after 15 days of adaptation. The diets were fed twice per day at 8am and 3pm. Samples of the feed offered and refusals were collected daily. The animals were slaughtered at the end of the experimental period for determination of carcass yield (CY; calculated by dividing the hot carcass weight by the final body weight after fasting), and the carcass average daily gain (CADG; obtained through the final yield in relation to the initial yield, being the initial yield represented by the animals slaughtered at the beginning of the experiment).

Samples of feed and orts were processed and submitted to analysis of DM according to Association of Official Analytical Chemists (AOAC). Results were subjected to analysis of variance and the means were compared by orthogonal contrasts. Analysis of linear and quadratic effects was conducted for levels of concentrate in the diets with StS. The value  $\alpha = 0.05$  was adopted for all analyses using the SAS software, version 9.0.

## Results

The diet containing 80% StS had lower ( $P < 0.05$ ) dry matter intake (DMI) compared to the others diets (Table 1). On the other hand, the silage with 40% of StS had higher ( $P < 0.05$ ) DM intake in relation to the control diet (corn silage).

Lower ( $P < 0.05$ ) weight gain and carcass yield were observed in those animals fed the diet containing 80% StS. The CADG observed for the diet with 40% StS was similar

**Table 1. Intake and performance of beef cattle fed with *Stylosanthes* (StS) or corn silage (CS) diets. Contrasts: 1= StS-80:20 x CS-60:40, 2= StS-40:60 x CS-60:40, 3= StS-60:40 x CS-60:40. DMI= dry matter intake; BW = body weight; ADG = average daily gain; CY = carcass yield; CADG= carcass average daily gain. SEM= standard error of the mean.**

Item	StS diets			CS 60:40	Contrasts			SEM
	80:20	60:40	40:60		1	2	3	
DMI (kg/day)	6.81	9.38	9.96	8.69	0.0011	0.1783	0.0183	0.28
DMI (%BW)	1.80	2.30	2.39	2.13	0.0070	0.1301	0.0250	0.06
ADG (kg/day)	0.81	1.42	1.62	1.64	<.0001	0.1449	0.8940	0.08
CY (kg/100kg BW)	54.31	54.72	56.06	56.12	0.0143	0.0512	0.9199	0.31
CADG (kg/day)	0.25	0.48	0.63	0.64	<.0001	0.0050	0.8949	0.03

**Table 2. Effect of *Stylosanthes* silage levels (StS) on dry matter intake and beef performance.**

Items	StS (%)			Effects		Standard Error of the Mean
	80	60	40	Linear	Quadratic	
Dry matter intake DMI (kg/day)	6.81	9.38	9.96	<.0001	0.0267	0.34
DMI (%Body weight BW)	1.80	2.30	2.39	0.0001	0.0622	0.07
Average daily gain ADG (kg/day)	0.81	1.42	1.62	<.0001	0.0761	0.09
Carcass yield CY ( kg/100kg %)	54.31	54.72	56.06	0.0283	0.4842	0.33
Carcass average daily gain CADG (kg/day)	0.25	0.48	0.63	<.0001	0.2958	0.04

( $P>0.05$ ) to that of corn silage. This is probably due to the characteristic of potentially degradable fiber, which is higher in corn silage in relation to *Stylosanthes* silage, because of the higher content of indigestible neutral detergent fiber (iNDF). A linear increase ( $P<0.05$ ) was observed for DM intake and performance characteristics, with the increasing level of concentrate in the diets containing *Stylosanthes* (Table 2). Linear increases in weight gain of confined animals with increasing level of concentrate in the diet are often found in the literature (Costa *et al.* 2005).

### Conclusion

*Stylosanthes* silage, constituting 40% of total DM of the diet, resulted in animal performance similar to that of corn silage.

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### References

- Costa MAL, Valadares Filho SC, Paulino MF, Valadares RFD, Cecon PR, Paulino PVR, Moraes EHBK, Magalhães KA (2005) Desempenho, digestibilidade e características de carcaça de novilhos zebuínos alimentados com dietas contendo diferentes níveis de concentrado *Revista Brasileira de Zootecnia* **34**(1), 268-279.
- Pereira OG, Silva TC, Ribeiro KG (2012) Tropical legume silages. In: Odilon Gomes Pereira, Dilermando Miranda da Fonseca, Karina Guimarães Ribeiro, Fernanda Helena Martins Chizzotti. (Org.). Anais do VI Simpósio sobre Manejo Estratégico da Pastagem. 1ed.Visconde do Rio Branco: Suprema Gráfica e Editora Ltda, v. 1, 269-315.
- Souza WF, Pereira OG, Valadares Filho SC, Ribeiro KG, Cezario AS, Silva VP (2012) Intake and productive performance of Nellore steers fed diets containing different proportions of *Stylosanthes* cv. Campo Grande In: XVI International Silage Conference, Hämeenlinna, Finland 498 – 499.