

Methane of animal origin in cattle fed high or low tannin sorghum silage

T.T. Berchielli², S.G. Oliveira², M.P. Pedreira², O. Primavesi³, M.A. Lima³ and R. Frighetto³

²Faculdade de Ciências Agrárias e Veterinárias – Unesp, Via de Acesso Prof. Paulo Donato Castellane, Mail Code 14884-900, Jaboticabal – SP, Brazil, Email: tberchi@fcav.unesp.br, ³Empresa Brasileira de Pesquisa Agropecuária, Rod. Washington Luiz, Km 234, Caixa Postal 339, CEP 13560-970, São Carlos – SP, Brazil

Keywords: beef cattle, intake, methane, sorghum silage, tannin

Introduction The harmful or beneficial effects associated with the presence of tannin in plants depends on its concentration and form. One of these beneficial effects is the reduction of the production of methane in the rumen (Woodward et al., 2001). This study financed by FAPESP aimed to evaluate the effect of diets containing low or high tannin sorghum silage supplements on dry matter intake (DMI) and methane production in cattle.

Material and methods Eight Nelore steers were fed low or high tannin sorghum silage plus additional supplements of urea or concentrate. The methane eructed by the animals was collected by means of a capillary tube connected to a PVC tube adapted to the neck of the animals according to the methodology of Johnson & Johnson (1995).

Results Dry matter intake was higher for animals receiving diets supplemented with concentrate (Table 1). Roughage source had no effect on DMI and methane production suggesting that there was no effect of tannin concentration in the evaluated silages (Table 2). Diets containing 60% concentrate yielded the highest methane production per animal and per kg live weight, this is in agreement with the study of Berchielli et al. (2005). Relating methane production to DMI revealed no difference between forage or supplement sources, suggesting that methane production per animal should not be considered as an isolated factor.

Table 1 Dry matter intake and methane production in beef cattle

Treatments	DMI (kg/d)	Methane (g animal/d)	Methane (g/kg LW)	Methane (g/kg DMI)	
LTSU	3.50	49.52	0.22	14.02	
LTSC	5.82	66.63	0.31	11.66	
HTSU	3.72	49.27	0.22	12.73	
HTSC	5.83	70.44	0.32	11.62	
Coefficient of variation (%)	35.60	41.84	27.84	21.65	
Main Effects					
Roughage	SBT	4.66	58.07	0.26	12.84
	SAT	4.78	59.85	0.27	12.18
Supplement	Concentrate	5.83 b	68.53 b	0.31 b	11.64
	Urea	3.61 a	49.40 a	0.22 a	13.38

LTSU – Low tannin silage + urea, LTSC – Low tannin silage + concentrate, HTSU – High tannin silage + urea, HTSC – High tannin silage + concentrate.

Means followed by different letters in the same column are significantly different at 5%, according to the test of Tukey.

Conclusions Increasing the concentration of tannins within the silage did not promote any reduction in the production of methane. The production of methane as a function of DMI indicates that the use of dietary energy must be maximized so that methane production during the production cycle can be reduced in relation to production per unit of animal product.

References

- Berchielli, T.T., M.P. Pedreira, & S.G. Oliveira (2003). Determinação da produção de metano e pH ruminal em bovinos de corte alimentados com diferentes relações volumoso:concentrado. In: *Reunião Anual da Sociedade Brasileira de Zootecnia*, Anais. Santa Maria: SBZ, CD-ROM.
- Johnson, K.A., & D.E. Johnson (1995). Methane emissions from cattle. *Journal of Animal Science*, 73, 2402-2492.
- Woodward, S.L., G.C. Waghorn, & M.J. Ulyatt (2001). Early indications that feeding Lotus will reduce methane emissions from ruminants. *Proceedings of the New Zealand Society of Animal Production*, 61, 23-26.