Good quality grass pasture decreases rumen methane production *in vitro*

Abdalla, A.L.[a]; Soltan, Y.A.[a,b]; Silva, L.R.F.[a]; Louvandini, H.[a]; McManus, C.M.[c]; Lucas, R.C.[a]; Morsy, A.S.[a,d]; Beleosoff, B.S.[e]; Abdalla Filho, A.L.[a]

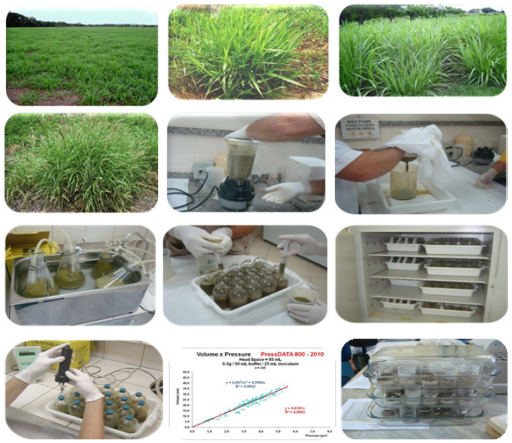
[a] Centro de Energia Nuclear na Agricultura , Universidade de São Paulo, São Paulo, Brazil, [b] Faculty of Agriculture, University of Alexandria, Alexandria, Egypt, [c] Faculdade de Agronomia, Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil, [d] Animal Production Research Institute, Cairo, Egypt, [e] Faculdade de Agronomia e Medicina Veterinária, Universidade de Brasília, Brasília, Brazil.

OBJECTIVE

To evaluate tropical grasses for their rumen methanogenesis and degradability characteristics to understand the likely relationship between forage grass quality and methane (CH_4) production for a range of pasture systems.

MATERIAL AND METHODS

- Four tropical pastures, i,e. Aruana (***Panicum maximum***), Napier grass (***Pennisetum purpureum***), Brachiaria (***Brachiaria decumbens***) and Buffel grass (***Pennisetum ciliare***) were collected throughout one year at different regrowth periods (2, 3 or 4 weeks) according to pasture availability.
- Samples of 0.25 m^2 were collected from each production site through cutting with scissors the plants at 20 cm height (the grazing portion of the stand).
- *In vitro* gas production assay adapted to semi automatic system (Bueno et. al., 2005) using pressure transducer and data logger (Press Data 800, LANA-CENA/USP, Piracicaba, Brazil) was used for quantifying CH_4 production and fiber degradability.
- Six adult Santa Inês sheep (60 ± 2.5 kg of BW) used as inoculum donors.
- Methane was determined using gas chromatograph (Longo et al. 2006) and the truly degraded organic matter was determined following Van Soest, (1991).



RESULTS

Table 1. Chemical composition (g/kg) of tropical grasses harvested form pastures within periods in the growing season

Item	Tropical grasses				*P-value*	S.E.M.
	Aruana	Brachiaria	Buffel	Nappier		
Organic matter	889^{B}	917^{A}	923^{A}	856^{C}	<0.001	34.5
Crud protein	164^{A}	98^{B}	78^{B}	156^{A}	<0.001	39.0
Neutral detergent fiber	703^{B}	706^{B}	792^{A}	606^{C}	<0.001	31.8
Acid detergent fiber	418^{B}	385^{B}	484^{A}	374^{B}	0.002	25.1
Lignin	78^{A}	54^{B}	74^{A}	59^{AB}	0.003	13.6
Hemicelulose	285^{B}	321^{A}	308^{AB}	232^{C}	<0.001	26.1
Cellulose	340^{B}	331^{B}	409^{A}	315^{B}	0.001	28.1

Table 2. Rumen gas (GP), methane (CH_4) production and degradability of tropical grasses harvested form pastures within periods in the growing season

Item	Tropical grasses				*P-value*	S.E.M.
	Aruana	Brachiaria	Buffel	Nappier		
GP (ml/g DM)	58.7	67.6	59.9	55.0	0.117	13.78
CH4(ml/g DOM)	4.7^{C}	8.1^{B}	12.1^{A}	5.6^{BC}	<0.001	2.59
CH4 (ml/g DNDF)	11.5^{C}	26.2^{AB}	32.7^{A}	20.3^{B}	<0.001	11.12
TDOM (g/kg OM)	358^{AB}	334^{B}	237^{C}	401^{A}	0.001	38.8
DNDF (g/kg NDF)	189^{A}	135^{AB}	111^{B}	154^{AB}	0.041	45.9
PF (mg TDOM/ml GP)	3.83^{A}	3.21^{B}	2.50^{C}	4.12^{A}	<0.001	0.38

^{a,b,c} means with different superscripts within row, are different (P<0.05), SEM, standard error of difference between means, TDOM= truly degrade organic matter, DNDF=degraded neutral detergent fiber, PF= partitioning factor.

CONCLUSION

Better quality grass, characterized by lower fiber and higher protein content, is potentially promising on reducing ruminal methanogenesis while improving organic matter degradability.

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