Nellore heifers methane emissions in native and cultivated pastures of the Pantanal at the dry season.

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Introduction

The Pantanal is a plain of alluvial sedimentation, partially and temporarily flooded. With a natural capacity for beef cattle, especially for phase creates. The Pantanal has numerous fields of native grasslands and mixed pastures, represented by a mixture of cultivated pastures in the high parts of the land (*Uroclhoa humidicola* common and Llanero) and native pastures in the low and humid parts. Differences in forage supply and diet quality lead to changes in intake and as a result in the emission of methane. Individual data of methane emission fluxes need to be related to food intake for better interpretation of the systems, and for an appropriate systemic evaluation is necessary to consider the production efficiency, considering this way all of a calf production cycle, as refers to the Pantanal creates systems. This study aimed to compare the individual emissions of heifers in native or mixed pastures of the Pantanal.

Material and Methods

Twelve heifers were divided into two treatments with six replicates, and allocated in paddocks with native or mixed pastures, of the Experimental Farm Nhumirim (Embrapa Pantanal). It was administered orally one capsule containing sulfur hexafluoride gas (SF6) of known and constant release in the rumen of each heifer, to serve as a tracer

gas in the methane emissions estimates, according to the technique described by Johnson et al ., 1994. The samples for methane emission measures and intake of dry matter (DM), were carried out between August 24 and September 12, 2014, and the animals were subjected to prior adaptation of 14 days. The fecal output (FO) was estimated by indicator titanium dioxide (20g / animal / day) by a relationship between the daily amount administered and the amount found in the faeces. The degradability data were determined by the method of *in situ* digestibility (Orskov et al., 1980) after incubation for 240 hours. For intake estimates applied to the inverse relationship between the FO and the indigestible forage. Issued methane values were divided by the average intake for estimating the emission per kg feed. It performed preliminary analysis of the distribution of data in order to use the tests, parametric (Student's t test) and nonparametric (Kruskal-Wallis test) averages.

Results and Conclusions

Methane emissions when expressed per animal / day were lower ($P < 0.05$) in native pastures, while emissions per kg feed did not differ ($P > 0.05$) between treatments (Table 1). Fecal excretion of animals was greater in animals on mixed pasture ($P < 0.05$) associated to the greater digestibility of the diet led to increased intake ($P < 0.05$) (Table 2), and consequently the equal ($P > 0.05$) in emission of methane consumed per kg of forage consumed (Table 1).

Table 1. Means of methane emissions per animal/day and per kg of food consumed in mixed and native pastures of the Pantanal.

	Pastures		Difference	P
Methane emissions	Mixed	Native		
Per animal (g/day)	171,85[a]	140,57[b]	31,28	0,0391
Per kg of feed (g/kg de DM)	18,65[a]	21,01[a]	-2,36	0,2351

Means followed by different letters in the same line differ statistically.

Table 2. Means values of fecal excretion, digestibility and intake of dry matter (DM) of heifers in mixed and native pastures of the Pantanal.

	Pastures		Difference	P
	Mixed	Native		
Fecal excretion(kg deDM)	3,771[a]	3,494[b]	0,277	0,0491
Digestibility (%)	59,35	48,44	-	
Intake (kg de DM)	9,277[a]	7,229[b]	2,048	<0,0001
Intake (% Body Weight)	1,932[a]	1,403[b]	0,529	<0,0001

Means followed by different letters in the same line differ statistically.

Observed by Kruskal-Wallis one-way analysis of variance different behaviors ($P < 0.05$), the daily methane emissions between treatments (Figures 1 and 2), which may originate in a widest possible variability in the diet in native grassland probably occasioned by variations in the floristic composition of the grazing sites. This fact demonstrates the need for repeatability of tests, because beyond the climatic effects on pasturage, other factors such as grazing intensity can affect more intensely the native pastures, the result of strong natural selection process of the diet for the animals.

Figure 1. Methane emission distribution curve in mixed pastures in the Pantanal.

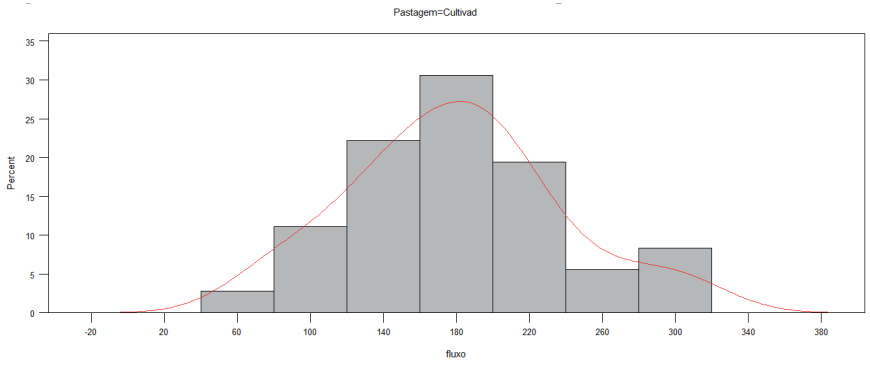
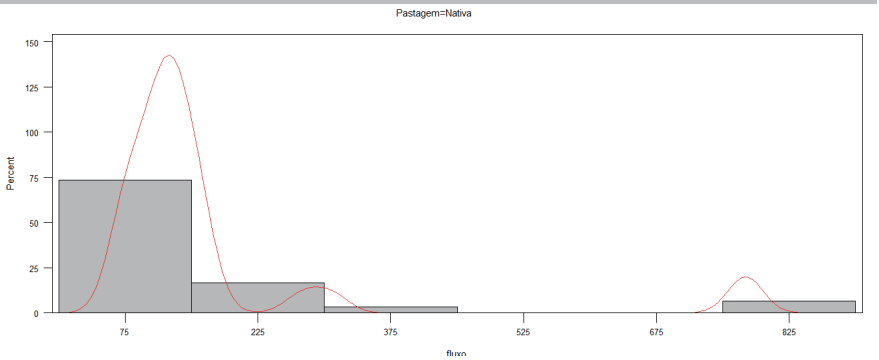


Figure 2. Methane emission distribution curve of native grasslands in the Pantanal.



The data obtained in this study showed no differences in methane emissions between native and cultivated pastures, the result of higher intake observed in the cultivated area. To better understand the systems - as regards the issue of enteric methane; the measurement data is critical in the various seasons. On the other hand, efforts should be concentrated in order to measure methane emissions per kg of calf produced in both systems, as this is the main product of cattle in the Pantanal.

References

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