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Effect of the use of the SF_6 tracer gas technique on the performance of Nellore Cattle

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Introduction: Alongside the increasing global demand for red meat there is also increasing pressure from environmentalists to increase the productivity of systems. Recent studies have highlighted the environmental aspects of production systems, assessing methane (CH_4) emissions, the principal gas emitted by ruminants, among other sources of GHG emissions. The sulphur hexaflouride (SF_6) tracer gas technique is the most widely used and recognized for measuring rates of CH_4 emissions, however, it is a technique that involves subjecting the animal to alterations in routine due to the use of collecting apparatus in the head and neck area. The objective of this study was to assess the effect of using the the SF_6 tracer gas technique for measuring CH_4 on the performance of the animals grazing pasture.

Material and Methods: The experiment was carried out at the São Paulo Agency for Agribusiness Technology (Agência Paulista de Tecnologia dos Agronegócios – APTA) in Colina/SP, in 2014 and 2015, over a total period of 432 days. The study used 96 steers for assessment of performance, randomly distributed across 12 paddocks, uniform in terms of breed (Nelore), age, sex (uncastrated males) and initial body weight (197 kg). Of these animals, 25 were used to assess enteric methane emissions from pasture (Methane group). For the sampling and measurement of methane the SF_6 tracer gas technique was used, as refined by Berndt et al. (2014). The methane samples were taken during 5 consecutive days, changing the yoke every 24 hours. The

animals were adapted to the sampling apparatus (yoke and halter) for a period of 10 days. Six samples were taken, two in each phase of the experiment: dry season (135 days), wet season (168 days) and pasture confinement (129 days). Data were analyzed using the statistical package SAS 9.2 MIXED procedure (SAS, 2008). Means were compared using the "t" test to the 10% level of significance.

Results and Conclusions

Table 1. Performance variables of Nellore.

Variables	Treatments		Means ± SE	*P*
	Methane Group	Control Group		
	n=25	*n*=71		
Live weight (kg)	514.0	506,5	510.3 ± 12.07	*0,5425*
Average daily gain (kg/d)	0,752	0,756	0,754 ± 0.026	*0,8961*
Carcass weight (kg)	301.5	299.8	300,7 ± 7.225	*0,8133*

Based on these results we can conclude that the SF6 tracer gas technique did not affect the performance of the animals in a pasture production system.

References

Berndt, A., T. M. Boland, M. H. Deighton, et al. 2014. Guidelines for use of sulphur hexafluoride (SF6) tracer technique to measure enteric methane emissions from ruminants. Pages 166. M. G. Lambert, ed. New Zealand Agricultural Greenhouse Gas Research Centre, New Zealand.