478

Feedlot pen surface greenhouse gases emissions from Nellore or Brangus
bulls finished on diets with contrasting fat levels

Feedlot pen surface greenhouse gases emissions from Nellore or Brangus bulls finished on diets with contrasting fat levels

Sérgio Raposo de MEDEIROS[1]*, Ciniro COSTA JÚNIOR[2], Rodrigo da Costa GOMES[1], Carolina Tobias MARINO[1], Paulo Eduardo Pedrosa BARROS[3]

[1]Embrapa Beef Cattle, Brazil; [2]Institute of Agricultural and Forest Management and Certification - Imaflora, Brazil, [3]Federal University from the Vales of Jequitinhonha and Mucuri, Brazil;. E-mail: sergio.medeiros@embrapa.br*

Introduction

The objective of this study was to evaluate greenhouse gases (GHG) emissions from a feedlot pen surface where Nellore and Brangus bulls were fed diets with low or high fat.

Material and Methods

Four pens were selected to be the experimental units, each one receiving a treatment as the combination of the diets and breeds tested: 1) Low fat, Nellore (n = 10); 2) High fat, Nellore (n = 9); 1) Low fat, Brangus (n = 10); 2) High fat, Brangus (n = 10). Fat levels were 3.2% and 6.4%, (ether extract % DM). Pens were rotationally occupied during all feedlot period (84 days) and each animal remained for at least 48 hours in two occasions in the pen of his respective treatment. GHG emission was measured using gas chambers (32 cm X 53 cm X 32 cm), according to Costa Jr. et al. (2014). The samples were analyzed for methane (CH_4), carbon dioxide (CO_2) and nitrogen oxide (NO_2) by gas chromatography. Obtained values were used on formulas taking into account temperatures, chamber volume and surface area, atmospheric pressure and collection time to estimate the flux

of each gas as mass/area/time ($mg/m^2/d$). Only descriptive statistical
analysis are presented.

Results and Conclusions

From Table 1, an extremely high variability can be observed, what is
usual in this kind of study but was aggravated by the greatly variable
weather conditions during the experiment. Further analysis including
other effects (i.e. time, rain, soil moisture) are needed. The mean
data of 81 g CO2-Eq./pen/day represents about 3% of the expected
daily enteric emission of the animals.

Table 1. Flux $\pm$ standard deviation ($mg/m^2/day$) of Methane, Nitrogen Oxide and Carbon Dioxide for high fat (HF) or low fat (LF) diets fed to Brangus (Bran) or Nellore (Nel) bulls and the mean CO2-Eq for each treatment (g/day/pen)

Variable	Methane	Nitrogen Oxide	Carbon Dioxide	CO2- Eq (g/d/pen)
HF, Bran	0.64 ± 0.84	6.78 ± 6.66	717 ± 324	113
LF, Bran	1.09 ± 1.52	1.97 ± 1.79	485 ± 180	45
HF, Nel	0.57 ± 0.55	2.12 ± 1.28	487 ± 203	46
LF, Nel	1.13 ± 6.66	7.24 ± 9.24	755 ± 258	121

References

COSTA JR, C.; CHANGSHENG, L.; CERRI, C. E. P.; et al. Measuring and modeling ni-
trous oxide and methane emissions from beef cattle feedlot manure management: First
assessments under Brazilian condition. **J. Environ. Sci. and Health, Part B**. 49, 696–711,
2014.