

## CUMULATIVE EMISSIONS AND FRACTION N EMITTED AS N<sub>2</sub>O IN EXCRETA OF DIFFERENT HERBIVORE SPECIES

### EMISSÃO CUMULATIVA E FRAÇÃO DE N EMITIDAS COMO N<sub>2</sub>O EM EXCRETAS DE DIFERENTES ESPÉCIES DE HERBÍVOROS

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#### Abstract

The aim of this study was to evaluate the cumulative emissions and fraction of N emitted as N<sub>2</sub>O in dung of different species of herbivores (sheep, goats, beef cattle, dairy cattle and horses). The incubation was conducted in a greenhouse. Soil collection was carried out in an area of *Urochloa brizantha cv. Marandu* that has been established for more than 10 years. The experiment was carried out in a completely randomized design with five treatments and five replications. The treatments used were dung from sheep, goats, beef cattle, dairy cattle and horses. The amounts added per treatment were 400 g of soil and 100 g of fresh dung. The soil was maintained at a constant temperature and 18% volumetric moisture throughout the experimental period. The remaining Mason jars were kept in the incubator regulated at a constant temperature of 25.0 ± 1.0 °C and 80% relative humidity. The dung samples were dried in forced-air ovens at 55 °C, then ground and analyzed for dry matter (DM) and total nitrogen (TN). After the application of the treatments, the sampling was carried out daily during the first week. From the 8th day after application (DAA) onward, samples were collected three times a week up to 30 DAA, and weekly up to 100 days of evaluation. Sampling was performed after the chambers were closed (T<sub>0</sub>), and after 30 minutes (T<sub>30</sub>). There was a difference in cumulative N<sub>2</sub>O emissions between the evaluated dung, with the lowest emissions for dung of dairy cattle and horses, and the highest cumulative emission for goat dung (p<0.001). The cumulative emissions from dung of beef cattle and sheep did not differ from each other, and did not equal the cumulative emissions of the other treatments (p<0.001). For the fraction of N emitted as N<sub>2</sub>O, the highest fractions were found in goat and beef cattle dung, and the lowest in horse dung (p<0.001). The fractions of N emitted in the form of N<sub>2</sub>O by the dung of dairy cattle and sheep showed no significant difference between each other (p<0.001). The highest accumulated N<sub>2</sub>O emissions found in the dung of small ruminants and beef cattle were a reflection of the positive cumulative fluxes recorded during the 100 days of evaluation. The dung of these animals had anaerobic conditions due to the higher moisture content, so different trends in mineralization-immobilization in dung were caused by moisture, influencing the emission of N<sub>2</sub>O. The fractions of N emitted as NO were different from the findings reported in the literature. According to the IPCC (2019), higher fractions of N emitted as N<sub>2</sub>O come from cattle dung, opposite to what was found in this study, where N<sub>2</sub>O emissions by small ruminants were greater than or equal to those from large ruminants. The discrepancy between the results is due to different factors, among them environmental conditions in which the studies were carried out, the chemical composition of dung, and rate of N application by dung.

#### Keywords

Excreta, greenhouse gas, herbivores, nitrous oxide.