

## EFFECT OF MIXED PASTURE OF *MACROTYLOMA AXILLARE* AND *UROCHLOA BRIZANTHA* ON SHORT-CHAIN FATTY ACID PRODUCTION IN CATTLE

### EFEITO DO CONSÓRCIO DE *MACROTYLOMA AXILLARE* E *UROCHLOA BRIZANTHA* NA PRODUÇÃO DE ÁCIDOS GRAXOS DE CADEIA CURTA EM BOVINOS

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#### Abstract

Mixed pastures are grazing areas with more than one plant species at the same time, improving the sustainability of production systems. The objective of this study was to evaluate the effects of the intercropping between the legume *Macrotyloma* and Marandu grass on production of short-chain fatty acids (SCFA) through the *ex situ* technique of ruminal fermentation. The study was carried out at Instituto de Zootecnia (Nova Odessa, Sao Paulo, Brazil). The experiment followed the guidelines established in accordance with the ethical principles of animal experimentation of the Commission on Ethical Use of Animals of Instituto de Zootecnia (CEUA/APTA/IZ; no. 291-19). Four ruminally cannulated nulliparous Jersey heifers (465.12 kg  $\pm$  33.62 kg) in continuous stocking were evaluated. The experimental period was 25 days (12 days of adaptation to the systems, 12 days of dry matter intake (DMI) assessment and one day of *ex situ* collection) in November 2020 (spring in Brazil). The experiment had in a completely randomized block design. To estimate forage intake, titanium dioxide powder was used as an external indicator of fecal production, and indigestible neutral detergent fiber was the internal indicator. The *ex situ* technique consisted of collecting rumen samples in flasks, which were incubated in a thermostatic bath to simulate the rumen conditions for 30 minutes. The rumen content was measured during the day at 6 a.m., 10 a.m., 2 p.m. and 6 p.m. (BRT). The experimental treatments were grass (G): exclusive pasture of *Urochloa brizantha* cv. Marandu and grass + legume (GL): mixed pasture with *Urochloa brizantha* cv. Marandu and the legume *Macrotyloma axillare* (E. Mey. Verd, accession NO 279). The chemical characterizations of the forage were: G (DM = 91.63%; CP = 12.11%; ASH = 8.81%; NDF = 59.60% and ADF = 32.10%) and GL (DM = 91.54%; CP = 16.10%; ASH = 9.82%; NDF = 60.44% and ADF = 29.35%). The total forage mass: G = 4329.28kg ha<sup>-1</sup> and GL = 4733.90kg ha<sup>-1</sup>. The proportion of botanical components in the forage was: G (grass = 88.80% and dead material = 11.20%) and GL (grass = 62.17%, legume = 25.87% and dead material = 12.87%). Data were analyzed according to PROC MIXED (SAS 9.4). The results obtained were submitted to analysis of variance and submitted to the F-test at 5% probability. The DMI forage was G = 6.10 kg.day<sup>-1</sup> and GL = 9.11 kg.day<sup>-1</sup>; SEM = 0.76 P= 0.10 and the DMI in relation to live body weight was G = 1.37% and GL = 2.11%; SEM = 0.26 P= 0.18). The mixed pasture treatment GL had a higher production of acetic acid (G = 1.99 mol/kg.day<sup>-1</sup> and GL = 4.09 mol/kg.day<sup>-1</sup>; SEM = 0.31 P= 0.04), propionic acid (G = 0.48 mol/kg.day<sup>-1</sup> and GL = 1.32 mol/kg.day; SEM = 0.11 P= 0.03), butyric acid (G = 0.45 mol/kg.day<sup>-1</sup> and GL = 1.17 mol/kg.day<sup>-1</sup>; SEM = 0.08 P= 0.02). The mixed pasture decreased the acetate:propionate ratio (G = 4.13 mol/kg.day<sup>-1</sup> and GL = 3.11 mol/kg.day<sup>-1</sup>; SEM = 0.16 P= 0.04). The use of the *ex situ* technique generated a large amount of information for SCFA production. The mixed pasture of the legume *Macrotyloma* and the Marandu grass increased the production of all SCFAs. We concluded that *Macrotyloma* has potential for use as a feed for ruminants.

#### Keywords

Pastures and forage, continuous stocking with cattle, legume, propionic acid.

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