



Tropentag, September 18-20, 2019, Kassel

“Filling gaps and removing traps
for sustainable resource management”

Assessment of Quality and Rumen Degradability of Mixed Silages of Sugarcane Tops with Marabú Forage

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Abstract

The quality and rumen degradability of sugarcane (*Sacharum* spp.) tops with forage of Marabú (*Dichrostachys cinerea* L.) ensiled in combination with either molasses, lactobacillus or fungi as well as their combination were assessed. The lab-scale silages were made in triplicate from sugarcane crop and *D. cinerea* fields of two years old and harvested after 12 months and 90 d of regrowth, respectively (Santa Clara, Cuba). Sugarcane tops and *D. cinerea* forage were mixed in a ratio of 60:40, respectively and either or not in combination or not with one of the three following additives or their combination [fungal inoculant [FI; UC1 (*Penicillium* sp.) + UC13 (*Aspergillus* sp.) or *Trichoderma* sp. (L6+R6b)], *Lactobacillus plantarum* (LAB; 3×10^6 colony forming units/g fresh matter (FM)) and molasses (MOL; 39.4 g kg⁻¹ FM)]. Both FI were inoculated at three doses (FD; 1.5, 3.0 and 4.5 $\times 10^5$ spores g⁻¹ of FM) in order to prepare 28 treatments [2FI \times 3FD \times 2LAB \times 2MOL+4 control treatments (2LAB \times 2MOL)]. The chemical proximate content (CPC) prior and after ensiling, as well as the ensilability and the *in vitro* ruminal degradability (IRD) of the silages were determined. The metabolisable energy (ME) was estimated from CPC. The ensilability parameters (pH, lactate, acetate, ammonia, ethanol) were used to select the best silages by a full factorial design in the GLM of SPSS with FI, FD, LAB and MOL as factors. The CPC, ME and IRD of the best silages were compared by one way ANOVA of SPSS (post-hoc Tukey test was performed when $p < 0.05$). The forages that received simultaneous addition of all additives showed the best silage quality, independently of FI or FD. However, the FD ($p < 0.001$) but not the FI ($p > 0.05$) affected the fiber fraction content and IRD of organic matter (IRDOM). The ADF content was lower ($p < 0.001$) and the ME content and IRDOM were enhanced ($p < 0.05$) in those silages with higher FD. It was concluded that mixed silages of an invasive plant and fibrous by-product inoculated simultaneously with molasses, lactobacillus and fungi at doses of 3.0 and 4.5 $\times 10^5$ spores g⁻¹ of FM showed the best silage quality, the lowest ADF content and the highest IRDOM, independently of fungi strain.

Keywords: *Dichrostachys cinerea*, ensiling, fungi, lactobacillus, molasses, rumen degradability, sugarcane tops

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