

EFFECTS OF BOTH A COMMERCIAL INOCULANT AND CHEMICAL ADDITIVES ON MICROBIOLOGICAL QUALITY OF SUGARCANE SILAGE

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Sugarcane (*Saccharum officinarum*) is an interesting feed source for cattle in tropical area, since the harvesting phase matches with the drought season which is a period of shortage of feed. The objective of this study was to determine the effects of commercial inoculant and chemical additives association on microbiological quality of sugarcane silage. Treatments were distributed to forty-eight mini-silos in a 2 × 4 treatment factorial arrangement composed by two levels of microbial inoculant (INO, 0 or 4 g t⁻¹ of fresh sugarcane; INO had *Lactobacillus plantarum* at 3.0 × 10¹⁰ cfu g⁻¹ and *Propionibacterium acidipropionici* at 3.0 × 10¹⁰ cfu g⁻¹), three chemical additives (CHE, CaO, NaCl and urea at 1.0% on natural matter basis), and a treatment without additives. Samples (0.2 kg) were collected on day 60 from different sites of all silos and homogenized to form a composite sample. Subsamples of 10 g of each treatment were diluted in 90 mL of sterilized sodium chloride solution (0.9%) and a serial dilution was performed from 10⁻¹ until 10⁻⁶ in test tubes. The microorganism counting was performed in triplicate from each dilution using culture medium of MRS agar to lactic-acid bacteria, nutrient agar to aerobic and anaerobic bacteria (48 h of incubation at 37°C) and agar PDA (potato dextrose agar, 120h of incubation at 26°C) for mold and yeast. Data were submitted to analysis of variance using the PROC MIXED by SAS version 9.0. Inoculants provided with CHE increased the amounts of lactic acid bacteria, anaerobic bacteria and total bacteria in sugarcane silage. In addition, the INO association with CHE decreased the fungi proliferation in the silage. INO increased the lactic acid bacteria in the current experiment. Lactic acid bacteria inoculant strains have been selected for growth rapidly in a homofermentative manner under several temperatures and DM contents, and thus is expected that inoculants will be highly competitive and produce largely lactic acid compared to untreated silages. The association of INO and CHE or just the INO treatment had lower amounts of fungi, compared to treatments without CHE and INO or those treatments with CHE. Some strains of lactic acid bacteria may produce antifungal compounds. *L. plantarum* isolated from grass silage produced antifungal compounds (3-phenyllactic acid and 3-hydroxydecanoic acid) in MRS broth, and these compounds were higher in inoculated silage compared to those untreated. The association of INO and CHE positively affected the microbiological quality of sugarcane silage.

Keywords: Anaerobic, *lactobacillus*, *propionibacterium*

Acknowledgments: Universidade Federal da Grande Dourados- MS