

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

INFLUENCE OF PARTICLE SIZE AND DENSITY ON FERMENTATIVE LOSSES OF PALISADE GRASS SILAGE

Milene Puntel OSMARI¹, José Manuel SAUTE², Bruno de Souza CAMPOS², Fernando Alberto JACOVACI², Tatiana Garcia DIAZ², Kácia Carine SCHEIDT², João Luiz Pratti DANIEL², Clóves Cabreira JOBIM²

*corresponding author: milene.osmari@ufsc.br

¹ Universidade Federal de Santa Catarina, Florianópolis, Santa Catarina, Brasil

² Universidade Estadual de Maringá, Maringá, Paraná, Brasil

The use of perennial C4-grasses to make silage is an alternative to maintain feed supply during the dry season in tropical areas. The *Brachiaria* genus is widely used in Brazil, but few experiments have been devoted to the conservation of *Brachiaria* by ensiling. Additionally, ensiling grasses without wilting (direct-cut) might impair the fermentation and generate significant volumes of effluents, especially at higher silage density and shorter particle size. Thus, the objective was to evaluate the fermentative losses in *Brachiaria brizantha* cv. Paiaguás silage under three particle sizes and three ensiling densities. The experiment was conducted at the Experimental Farm of the State University of Maringá, Paraná, Brazil. A 1-ha sward of *B. brizantha* cv. Paiaguás was harvested after 90 d of regrowth, at 10 cm of stubble height, with a pull type harvester. Treatments evaluated were: three theoretical length of cut (5, 8 and 12 mm) and three ensiling densities (550, 600 and 650 kg m⁻³), arranged in a 3 x 3 factorial design. The ensiling process was carried out in PVC silos (0.013 m³), with an effluent collector device at silo bottom. For measuring total losses and losses by gas production, the silos were weighed before and after 90 d of storage, whereas effluent was collected once week. After silos were opened, silages were sampled for chemical analysis of dry matter (DM), ash, crude protein (CP), ether extract (EE) and neutral detergent fiber (NDF). The effluent volume was recorded and the chemical oxygen demand (COD) and biochemical oxygen demand (BOD) were also determined. The data were analyzed using the Mixed procedure of SAS. The fresh forage had 206.9 g kg⁻¹ DM, 101.8 g kg⁻¹ CP, 657.9 g kg⁻¹ NDF, 15.7 g kg⁻¹ EE and 797.6 g kg⁻¹ CHO. As expected, the shorter particle size and higher ensiling density improved the effluent production around 70 g kg⁻¹. The effluents had an average pH of 8.13, COD of 14,680 mg L⁻¹ and BOD of 3,613 mg L⁻¹, which made them a potential pollutant for the environment. There was no interaction between treatments on chemical characteristics of silages. The higher particle size may have decrease the forage fermentation process, which led to lower EE degradation and higher pH values. Then, independent of particle size and ensiling density, the losses of nutritional quality of *Brachiaria brizantha* cv. Paiaguás can be maximized with the effluents production, which is also a large pollutant of environment.

Keywords: loss, oxygen demand, pollution, tropical grass

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