ZOOTECNIA BRASIL
Centro de Convenções da PUC-GO | Goiânia-GO
27 a 30 de agosto de 2018

55ª REUNIÃO ANUAL DA SOCIEDADE BRASILEIRA DE ZOOTECNIA

ZOOTEC 28º CONGRESSO BRASILEIRO DE ZOOTECNIA

CONSTRUINDO SABERES, FORMANDO PESSOAS E TRANSFORMANDO A PRODUÇÃO ANIMAL

CHEMICAL COMPOSITION OF SILAGE OF BRS CAPIAÇÚ ASSOCIATED WITH DIFFERENT ADDITIVES

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Resumo: Este trabalho teve como objetivo avaliar diferentes aditivos na silagem de capim-BRS Capiaçú (*Pennisetum purpureum Schum*.) sobre a composição química. O experimento foi conduzido em delineamento inteiramente casualizado, sendo utilizado o capim BRS Capiaçú com quatro aditivos (10% de glicerina bruta, 10% de inclusão de feno da casca da banana, 10% de inclusão de peseudocolmo da bananeira e 10% de inclusão de feno da folha da bananeira), com cinco repetições e o tratamento testemunha (silagem exclusiva BRS Capiaçú). A inclusão de subprodutos agroindustriais na silagem do BRS Capiaçú aumentaram em 22,58% do teor de matéria seca em relação à silagem controle (29,18%) (P <0,01), mas não diferiram entre si, com média de 37,69%. A silagem de capim associado ao feno de bananeira apresentou maior teor de proteína bruta (8,37%; P <0,01) em relação aos demais tratamentos. A silagens controle e as silagens associadas ao feno de folhas de bananeira apresentaram maiores teores de fibra, média de 69,0%. Todos os subprodutos avaliados apresentam potencial de uso na silagem da BRS Capiaçú, devido à melhora na composição química da massa ensilada.

Key words: ash, crude protein, dry matter, neutral detergent fiber

Introduction

The production of ruminants in Brazil is based on nutritional forage plants whose nutritional value and food varies considerably throughout the year (Rigueira et al., 2018). Thus, the storage of forage by means of silage has been technique commonly used in the various regions of the country.

Grasses of the genus *Pennisetum* have been highlighted by the large volume of mass produced with emphasis on the cultivar BRS Capiaçú that produces about 30% more mass in relation to the other cultivars of the same species (Pereira et al., 2016). However, at the ideal cutting time for silage (2.5 to 3.5 m, 90 days) of the BRS Capiaçú, the dry matter content is below 28%, considered ideal for adequate fermentation capacity. Therefore, the use of additives in order to increase the dry matter content of the ensiled mass is necessary (Rigueira et al., 2018). The use of agroindustrial by-products is a low-cost alternative in certain regions and with potential for use in the ruminant diet (Rigueira et al., 2018). However, there are gaps in the knowledge of the chemical composition of BRS Capiaçú silage associated with different additives.

Based on the above, the objective was to evaluate the chemical composition of BRS Capiaçú silage associated with different agroindustrial additives.

Material and methods

The experiment was conducted in the Agrarian Sciences sector of the State University of Montes Claros, Janaúba Campus.

Elephant grass cv. BRS Capiaçú (*Pennisetum purpureum* Schum.) was used with four additives (10% inclusion of crude glycerin, 10% banana tree leaf hay, 10% inclusion of banana tree pseudostem hay, 10% inclusion of pre-dried banana peel) in a completely randomized design with five replicates and a control treatment (BRS

Capiaçú silage without an additive). The inclusion of by-products was based on natural matter.

The forage was collected from pre-selected areas at the UNIMONTES Experimental Farm when it reached 3.5 meters in height (90 days). The forage was harvested from five hills, and the additive was added in the respective proportions and homogenized before ensiling.

To produce the silage, experimental PVC silos of known weight were used that were 50 cm long and 10 cm in diameter. The silos were stored at room temperature on the premises of the Laboratory of Food Analysis of UNIMONTES, and they were opened 60 days after ensiling.

The pre-dried forage was then analyzed for the contents of dry matter (DM, 934.01), mineral matter (ash, 942.05) and crude protein (CP, 978.04) as described by the AOAC (1995). Neutral detergent fiber (NDF) was determined by the sequential method according to procedures described by Robertson and Van Soest (1981) using a TECNAL® TE-149 fiber determiner (Piracicaba, SP, Brazil).

The collected data were submitted to analysis of variance, and when the result of the “F” test was significant, the averages were compared by Scott Knott’s test using the PROC GLM function (SAS Institute Inc., Cary, NC, USA). Differences were considered significant when $P < 0.05$.

Results and Discussion

The inclusion of agroindustrial byproducts in the silage in increased BRS Capiaçú in 22.58% dry matter content compared to the control silage (29.18%) ($P < 0.01$), but did not differ among themselves, average 37.69% (Table 1). In general, the dry matter content verified between treatments is above 28% and below 40%, a range recommended for adequate fermentation of the mass.

Table 1 - Chemical composition of BRS Capiaçú silage associated with different agroindustrial additives

Item (%DM)[1]	Treatments [2]					SEM[3]	P-Value [4]
	Control	CS+CG	CS+BP	CS+PH	CS+LH		
Dry matter	29.18 b	37.55 a	37.89 a	36.03 a	39.31 a	1.61	<0.01
Ash	12.06 b	9.77 c	14.84 a	15.82 a	13.81 a	0.50	<0.01
Crude protein	7.16 b	6.38 c	7.16 b	4.47d	8.37 a	0.18	<0.01
Neutral detergente fiber	69.33 a	49.83 d	62.89 c	65.88 b	68.75 a	3.06	<0.01

Means followed by same letter in the line does not differ by Scott-Knot test at 5% probability. [1]DM – dry matter; [2] Control – control silage; CS – BRS Capiaçú silage; CG – crude gliceryn; BP – banana peel; PH – pseudostem banana tree hay; LH – leaf banana tree hay; 10% of inclusion in the natural matter.; [3] SEM – standart error means; [4] P- Probability

According to Pereira et al., (2016), the dry matter content of the BRS Capiaçú grass managed with age of 90 days is of 16.4% and of the silage of 18%. This value for silage is lower than that observed in this study. In parts, this increase in dry matter content is associated with dry matter losses during fermentation by concentrating the dry matter.

The inclusion of banana byproducts in silage BRS capiaçú grass provided higher ash contents in the silage (mean 14.8%; P <0.01), which was 18.64% higher than control silage and 34.09 percentage points higher than silage with crude glycerin. This is justified by the high concentration of minerals in these byproducts, mainly calcium, potassium and magnesium.

Grass silage associated with banana leaf hay presented higher crude protein content (8.37%; P <0.01) in relation to the other treatments. When the banana is well managed and fertilized, the leaves present up to 19% crude protein, which justifies the highest verified values. The lowest levels of crude protein were observed in the silage associated with pseudostem hay and crude glycerin. In silage with crude glycerin is justified by the dilution effect as reported by Rigueira et al., (2018). The lowest crude protein content in pseudostem is a factor that explains the low levels of this ingredient in silage. The dilution behavior of the components in the silages provided by the crude glycerin was verified for the neutral detergent fiber content (P <0.01) in comparison to the other treatments. Control silage and silage associated with banana leaf hay showed higher fiber contents, mean of 69.0%.

Conclusion

All the evaluated byproducts present potential of use in the silage of BRS Capiaçú due to the improvement in the chemical composition of the ensiled mass.

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