



Total and non-fibrous carbohydrates intake and digestibility of five forage sorghum silages harvested in a Brazilian semi-arid region

Rafael D. Santos *¹, Lúcio C. Gonçalves², André L. A. Neves³, Luiz G. R. Pereira³, Carolina B. Scherer², Gherman G. L. Araújo¹, Evandro N. Muniz⁴, Getúlio F. Oliveira⁵,

* Scientific Researcher, Embrapa; 3250 Beira Mar Ave.; Aracaju, Sergipe 49025-040 Brazil;

¹Embrapa Semiárido, Petrolina, PE; ²Universidade Federal de Minas Gerais, Belo Horizonte,

MG; ³Embrapa Gado de Leite, Juiz de Fora, MG; ⁴Embrapa Tabuleiros Costeiros, Aracaju, SE;

⁵Universidade Federal de Sergipe, Aracaju, SE

* rafael.dantas@embrapa.br

Sorghum has potential to be used as a feed source for ruminants, especially in semi-arid regions, owing to its high resistance to drought and extreme temperatures factors that contribute to increase its yield for silage production as compared to traditional crops (i.e. corn) grown under arid conditions. Carbohydrates are the main source of energy for ruminants as volatile fatty acids are metabolized during fermentation process in rumen. However, the type and concentration of structural cell wall in forage sorghum may have a negative impact on carbohydrates intake and digestibility as it has a more recalcitrant cell wall than grain or dual-purpose sorghum. The objective of the current study was to evaluate the intake and digestibility of total (TCH) and non-fibrous carbohydrate (NFCH) of five forage sorghum silages harvested in a Brazilian semi-arid region by using rams, with treatments consisting of five cultivars (BRS Ponta Negra, BRS 655, BR 601, BRS 506 and BRS 610). Plants were harvested as grain exhibited dough stage approximately 95 days after planting and chopped in a stationary silage harvester to a length of 2 cm. Twenty-five rams (average body weight of 21.7 ± 2.1 kg) were used in this experiment. During the first 25 days, animals were adapted to the diets in metabolic cages, with total collection of feces being conducted over a 5 day period by using individual bags. A completely randomized design with five treatments and five replications was used, with variables being tested to check if data had normal distribution before carrying out the analysis of variance. Means were compared by Tukey test at 5% probability ($P < 0.05$). According to chemical analysis the five cultivars exhibited on average the following characteristics: DM, TCH and NFCH of 32.4%, 82.1% and 20.7%, respectively. No difference ($P > 0.05$) in DM intake (in g day^{-1} and in g per unit of metabolic size - g UMS^{-1}) or in DM apparent digestibility were observed DM intake (in g day^{-1}) ranged from 604.0 to 700.0, whereas UMS intake ranged from 63.4 to 68.4 g UMS^{-1} . DM apparent digestibility was on average of 59.6%. Total carbohydrates intake (in g day^{-1} and g UMS^{-1}) was similar ($P > 0.05$) among treatments, being observed average consumption of 544.8 g day^{-1} and 54.0 g UMS^{-1} . However, difference was observed ($P < 0.05$) in TCH apparent digestibility, with BRS 506 having higher TCH apparent digestibility than BRS 655, which, in turn, was similar to BRS 610, BR 601 and BRS Ponta Negra. In regards to NFCH, it was observed that treatments differed ($P < 0.05$) in intake (g day^{-1} and g UMS^{-1}). As for NFCH intake (in g day^{-1}), BR 601 and BRS 506 were higher (191.1 and 176.8 g day^{-1} , respectively) than BRS Ponta Negra, BRS 655 and BRS 610 (125.3, 124.3 and 94.1 g day^{-1} , respectively) which did not differ from each other. BR 601 and BRS 506 (18.6 and 17.3 g UMS^{-1} , respectively) resulted in higher intake in g UMS^{-1} than BRS Ponta Negra, BRS 655 and BRS 610 (12.2, 13.0 and 9.2.1 g UMS^{-1} , respectively). However, BRS 655 contributed to a higher intake in g UMS^{-1} than BRS 610, which did not differ from BRS Ponta Negra. Finally, NFCH apparent digestibility did not differ among treatments and was on average of 74.3%.

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