54ª. Reunião Anual da Sociedade Brasileira de Zootecnia
24 a 28 de Julho de 2017
Hotel Bourbon Cataratas – Foz do Iguaçu – Brasil
ISSN 1983-4357

Theme 9 | Ruminant nutrition and production

Water intake by Girolando heifers in integrated crop, livestock (ICLS) and forestry (ICLFS) systems

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Water is not only one of the most important nutrients in animal nutrition, but also plays an essential physiological role related to the thermal homeostasis. Heat stress in dairy cattle is one of the leading causes of decreased production and fertility. The objective of this work was to evaluate the water intake of Girolando heifers in integrated crop, livestock (ICLS) and forestry (ICLFS) systems. Trial was carried out at experimental field of Embrapa, Porto Velho, Rondônia, Brazil. Experimental period was from September to November of 2015. Eight 25 month-old Girolando (¾Holstein × ¼Gir) heifers with 262.5±85.6 kg of live weight (LW) were randomly distributed between two homogeneous groups submitted to pastures cultivated with *Brachiaria brizanta* cv. Xaraés under intermittent management for maintain forage dry mater availability above 15% of LW. The pasture of ICLFS was shaded by seven tiers of eucalyptus (*Eucalyptus grandis*)trees using 3x3 m of planting distance. The experimental design was a 2x2 crossover with two systems (ICLS and ICLFS) and two sequences of 30-day periods (10 days for adaptation followed by 20 days for data collection). A behavioral study was done by bioacoustic data collected during 48 hours using MP3 recorders. Data were analyzed by Audacity® software for identification of time (in minutes) spent by animals in the activity of drinking water. Concomitantly, the ambient temperature and relative humidity data were taken from datalogger-thermohygrometers adapted in PVC shelters placed in the center of each experimental area. The THI values were estimated by Kibler's equation: 1.8Ta - (1 - RH) (Ta - 14.3) + 32; where Ta is the ambient temperature in °C, RH is the relative humidity as a fraction of the unit. Variance analysis was performed by MIXED procedure of SAS. Means were compared between treatments (ICLS and ICLFS) within two period of the day (daytime = 6 a.m. to 6 p.m. and night time = 6 p.m. to 6 a.m.) by Tukey test at 5% of significance level. There was a significant ($P<0.05$) difference between daytimes, being the higher water consumption observed during the day (7.56 vs. 1.43 minutes, respectively). Regardless daytime, heifers spent more time drinking water in the ICLS (5.87 vs. 3.12 minutes, respectively), which should be explained by the differences ($Pr = 0.0226$) between THI values of ICLS and ICLFS (79.0489±0.3123 and 78.9797±0.3123, respectively). Girolando heifers spent more time drinking water during the day and in unshaded pasture.

Keywords: animal welfare, silvopastoral, warm stress

Acknowledgments: To National Counsel of Technological and Scientific Development (CNPq) (Brazil) for financial support of this project (Grant n. 459130/2014-5).