



Comportamento em pastejo e temperatura interna de vacas lactantes Gir x Holandês suplementadas com óleo de soja

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Resumo: Objetivou-se com esse trabalho avaliar o comportamento em pastejo e a temperatura interna de vacas lactantes Gir x Holandês suplementadas ou não com óleo de soja. Foram utilizadas oito vacas $\frac{1}{2}$ e $\frac{3}{4}$ Holandês-Zebu multíparas, com média de 84 dias em lactação e de 19 kg/leite/dia, as quais foram mantidas em pastagem de capim-marandu (*Brachiaria brizantha* Stapf cv. Marandu). Os animais foram pareados de acordo com grau sanguíneo e produção de leite em dois grupos experimentais: 1) Controle (C), para suplementação com concentrado sem a adição de óleo de soja; 2) Tratamento (OS), para suplementação com concentrado contendo 3% de óleo de soja na matéria seca (MS). Para análise comportamental foram coletados dados de bioacústica com gravador de MP3 e a temperatura interna foi medida utilizando um termômetro *data logger* acoplado a um dispositivo intravaginal (CIDR), ambos foram mantidos nos animais por 48 horas. A análise estatística foi feita utilizando-se a ferramenta *General Linear Models* (GLM) do Minitab 17. Foi possível observar que vacas do grupo controle e tratamento apresentaram comportamento semelhante em termos de pastejo, ruminação e ócio. Os animais de ambos os grupos também apresentaram temperatura interna semelhante, sendo a média de $39,1 \pm 0,12^\circ\text{C}$, considerada dentro dos padrões fisiológicos. A adição de óleo de soja no concentrado não altera a temperatura interna e o comportamento em pastejo de vacas mestiças em lactação.

Palavras-chave: comportamento ingestivo, suplementação lipídica, vacas mestiças

Grazing behavior and internal body temperature of lactating Gir x Holstein cows supplemented with soybean oil

Abstract: The goal of this work was to evaluate grazing behavior and internal body temperature of lactating crossbred cows supplemented or not with soybean oil. Eight $\frac{1}{2}$ and $\frac{3}{4}$ Gir x Holstein multiparous cows with average of 84 days in lactation and daily milk production of 19 kg were evaluated in a marandu palisade grass (*Brachiaria brizantha* Stapf cv. Marandu) pasture. Two experimental groups were balanced according to genetic group and daily milk production. Cows in group 1 were fed basal diet without dietary fat supplementation (control, C); cows in group 2 were fed 3% (dry matter basis) soybean oil concentrated (treatment, SO). For behavioral evaluation bioacoustic data were collected by MP3 recorder and internal body temperature was taken by a modified intra-vaginal (CIDR) containing a logging device, both for data collection during 48 hours per week. Statistical analysis was performed by General Linear Models (GLM) of Minitab 17 software. It was observed that cows of control and SO treatment had similar grazing behavior in terms of grazing, rumination and resting time. Also, the internal body temperature of cows from both groups was similar, being $39.1 \pm 0.12^\circ\text{C}$ in average. This temperature was within the expected physiological variation. Addition of soybean oil to concentrate does not change grazing behavior and internal body temperature of crossbred lactating dairy cows.

Keywords: crossbred cows, ingestive behavior, lipid supplementation



Introduction

Dairy cows in Brazil are directly exposed to climatic effects due to the predominant grazing production system predisposing the cows to heat stress situations, especially in Amazon region. Nutrient metabolism generates heat which must be dissipated in a warm climate by physiological processes to maintain thermoneutrality. When environmental temperatures are over to 26°C animal thermoregulatory capacity is surpassed which leads animals go into heat stress. Physiological mechanisms start functioning to overcome this state, such as decreasing dry matter consumption for reducing metabolic heat generation. According to NRC (2001), with an environmental temperature of 40°C, consumption of dry matter decreases by 40% on the animal's well-being and affect animal thermoregulation and its productivity. Beede and Collier (1986) observed in animals under heat stress that feed intake reduces because of the lower time spent with grazing. Facing this, many studies have been doing in order to find alternatives to reduce heat stress in cows. ZHANG et al. (2011) suggested that supplementation of dietary fat on early-lactating cows during hot weather can alter milk components and blood parameters, which may be beneficial for enhancement of energy balance and alleviation of heat stress. In addition, Moallem et al. (2010) reported that increasing the energy density in diets of heat-stressed mid-lactation cows was effective in reducing metabolic heat production and increased metabolic efficiency. Thus, this study aimed to evaluate grazing behavior and internal body temperature of lactating crossbred cows supplemented or not with soybean oil.

Material and Methods

The trial was carried out at Experimental Field of Embrapa Rondônia, Porto Velho, during the rainy season, from September to November of 2014. Eight multiparous $\frac{1}{2}$ and $\frac{3}{4}$ Holstein-Gir lactating cows, averaging 84 days in lactation and daily milk production of 19 kg were used in a marandu palisade grass (*Brachiaria brizantha* Stapf cv. Marandu) pasture managed by rotational grazing with 16 paddocks grazed for three days with 27 days of resting period with a stocking rate of 2.5 AU.ha⁻¹. Experimental period had 15 days for diet adaptation and seven weeks for data collecting. During this period the THI mean was 75,9. Two experimental groups were balanced according to genetic group and daily milk production. Cows in group 1 were fed basal diet without dietary fat supplementation (control, C); cows in group 2 were fed 3% (dry matter basis) soybean oil concentrated (treatment, SO). Basal concentrate was composed by corn grain, soybean meal, mineral mix and urea. The nutrient levels of diets were formulated to meet the recommendations by NRC (2001) using the software AMTS Cattle Professional 3.4.5 (©Agricultural Modeling and Training Systems, LLC). In each week of evaluation period, internal body temperature was taken by a modified intra-vaginal (CIDR) containing a logging device adjusted for registering at each 10 minutes during 48 hours. Acoustic data were collected during 48 hours per week by MP3 recorders fixed in cow's halters. Acoustic data were analyzed by Audacity® software for identification of the times spent with grazing, resting and rumination activities. These times were transformed in percentage of total analyzed time since the milking times were discarded. Statistical analysis were performed by General Linear Models (GLM) of Minitab 17, considering treatments as fixed effect, cows and weeks as random effects, being week nested within cow.

Results and Discussion

There were no differences between experimental groups in relation to their grazing behavior in terms of time spent with resting, rumination and grazing (Table 1). Leme *et al* (2005) evaluated the behavior of Holstein x Zebu crossbreed cows in a silvipastoral system in Coronel Pacheco (MG), taking in account the time spent by cows in the stand-up position, eating, ruminating or in inactivity, during the summer and winter seasons. During the winter, cows spent more time at sunshine than in the summer; while during the summer cows spent more time resting under tree's shadow, especially those from big and dense crowns. The mean of time spent by cows grazing during the summer in the conventional pasture (without trees) was 22.4%, which is lower than the mean of grazing time observed in both groups of cows that were also in a non-shaded pasture (36.25%).

In relation to internal body temperature, there was no difference between cows from both experimental groups, being the mean of 39.1±0.12°C, which is considered within the expected physiological variation (Head, 1995; Cardoso, 1997).



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Table 1. Means of percentage of time spent with grazing, resting and rumination of cows supplemented (SO) or not (Control) with 3% of soybean oil concentrate (dry mater basis).

Activity	Group	Mean	Variation Coefficient (%)
Resting	Control	25.91±1.26	24,81
	SO	26.8±1.63	29,10
Rumination	Control	37.63±1.66	22,51
	SO	37.23±2.16	27,83
Grazing	Control	36.55±1.85	25,79
	SO	35.96±2.67	35,78

Conclusions

Addition of 3% soybean oil to concentrate does not change grazing behavior and internal body temperature of crossbred mid-lactation dairy cows.

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