



Behavior of Holstein, Gyr and crossbred Holstein-Gyr dairy heifers under different feeding levels

Mariana M. Campos^{1*}, Carlos A. A. O. Filho², Thierry R. Tomich¹, Luiz Gustavo R. Pereira¹,
Fernanda S. Machado¹, Adenilson P. Lopes³, Darlene M. Teixeira³

¹Embrapa Dairy Cattle, Juiz de Fora, MG, Brazil; ²Universidade Estadual do Sudoeste da Bahia, Vitória da Conquista, BA, Brazil; ³Instituto Federal de Rondônia, Porto Velho, RO, Brazil
*mariana.campos@embrapa.br

The evaluation of associations among behavior and nutrition is useful for the establishment of management practices for dairy cattle with focus on productivity and welfare. The objective of this study was to determine the effect of animal breed and feeding level on behavioral parameters of dairy heifers. Thirty six dairy heifers (body weight, 370 ± 50 kg; age, 27.5 ± 0.8 months) were housed in tie-stall barn with individual feed bins at Embrapa Dairy Cattle experimental station (Coronel Pacheco, Minas Gerais). 12 Holstein heifers, 12 Gyr heifers and 12 Holstein-Gyr crossbred heifers were randomly assigned to three treatments: fed at 1.17% of body weight BW, dry matter (DM) basis, fed at 1.46% of BW or fed at 1.95% of BW. The same diet was offered as total mixed ration during 28 days (70% corn silage and 30% concentrate, DM basis; 140 g of crude protein per Kg of DM). Behavioral observations were carried out on two consecutive days by five observers. Observations were done using instantaneous scan sampling at 10-min interval per animal. Observers watched from three meters directly behind each animal to evaluate the posture (standing or lying) and the behavior (idling, ruminating, feeding and drinking) of each animal during the observation period. There were determined time (min-day) spent feeding (F), time spent lying and ruminating (LR), time spent lying and idling (LI), time spent standing and ruminating (SR) and time spent standing and idling (SI). Treatments means were differentiated using Student–Newman–Keuls (SNK) test (SAS, 2013). There was no interaction of breed and feeding level for the parameters evaluated. Comparing the breeds, the Holstein heifers spent more time lying and ruminating ($P < 0.05$), whereas no differences were observed ($P > 0.05$) between Gyr (269.58 min) and Holstein-Gyr (256.25 min) heifers. There was significant effect ($P < 0.05$) of feeding levels for the time spent feeding, lying and ruminating and standing and idling. As the feeding level increased, the time spent feeding was higher (81.66, 113.33 and 142.91 min-d for animals fed at 1.17, 1.46 and 1.95% of BW, respectively). Regarding the time spent lying and ruminating, heifers fed at 1.95% of BW presented higher value (302.92 min-d) than others treatments, which were similar (235.0 and 200.0 min-d for heifers fed at 1.46 and 1.17% of BW, respectively). Heifers fed at maintenance level spent more time ($P < 0.05$) standing and idling (525.42 min-d), than heifers fed at 1.46 and 1.95% of BW (433.75 and 381.25 min-d, respectively). In conclusion, the behavioral parameters of dairy heifers housed in tie-stall barn are affected by feeding level. Other behavioral parameters, including vocalizations and oral stereotypies, which may be indicative of hunger and frustration should be evaluated as an indicator of animal welfare.

Keywords: ethology, feeding, idle, rumination

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