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2015
SP-PP-SP 6925

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ORLANDO, FLORIDA
July 12-16

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Dairy

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Ruminant Nutrition

-Presentation Format:

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I understand

Performance, heat production and methane emission in dairy heifers under different nutritional plans

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This study aimed to evaluate the effect of feeding levels (FL) and breed (B) on performance, heat production (HP) and enteric CH₄ emission in dairy heifers. Thirty six heifers, 12 Holstein, 12 Gyr and 12 crossbreed Holstein-Gyr (F1) with average live weight (LW) of 445.8 ± 98 kg and average age of 27.5 ± 0.8 months, were housed in tie stall and randomly distributed to the treatments in a 3x3 factorial design (feeding levels of 1.95% LW, 1.46% LW and 1.17% LW, on dry matter (DM) basis and breeds). The diet was offered as a total mixed ration (700g/kg of corn silage and 300g/kg of concentrate, on DM basis; 140g of crude protein (CP) per kg of DM). Respiratory exchanges (oxygen consumption and CO₂ and CH₄ production) were measured over two periods of 24h using four open-circuit respiration chambers and a Sable System (Sable Systems, Henderson, NV) of Embrapa's Bioenergetic Laboratory (Coronel Pacheco, Minas Gerais, Brazil). The equation from Brouwer was used to estimate HP. Data were subjected to analysis of variance and means were compared through the Student–Newman–Keuls test ($P < 0.05$). Significant effects were found for the interaction between B and FL for DM, organic matter (OM) and neutral detergent fiber (NDF) intakes (Kg/day, %LW and g/kg LW^{0.75}) and enteric methane emissions (L/day, g/kg DMI, g/kg OMI and g/kg NDFI). Animals fed at 1.17% LW level presented lower HP (Kcal/kg LW^{0.75}), feeding efficiency (FE) (Kg LW/kg DM_{ing}) and CH₄ emission (L/kg LW^{0.75}). Gyr breed presented lower heat production (132.5 Kcal/kg LW^{0.75}) and CH₄ emission (2.03 L/kg LW^{0.75}). For Gyr heifers, FE was higher than Holstein heifers but did not differ ($P > 0.05$) from F1 animals (0.11 and 0.10 Kg LW/kg DMI, respectively). F1 heifers presented higher ($P < 0.05$) daily mean gain (DMG), but did not differ ($P > 0.05$) from Holstein breed (0.81 and 0.67 kg/day, respectively). Animals fed at the level of 1.17% of LW presented lower DMG (0.40 kg/day). This Research Project was funded by Fapemig, CAPES, CNPq and Embrapa.

KEYWORDS

green house gases
respirometric chambers
zebu