

Relationships of feedlot residual feed intake with the performance and carcass traits during the previous growing phase in pastures

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A growing interest in the selection for improved feed efficiency has been observed in the Brazilian breeding industry. However, few information is available on the associations of the feed efficiency measured in individual pens and the performance in the previous growing phase on grazing conditions. Therefore, the aim of this study was to evaluate the relationships between feedlot residual feed intake (RFI) and the performance, the carcass traits and the body traits of Brahman cattle, measured in pastures during the growing phase. Twenty-four Brahman young bulls were used in this study. In the first phase, the cattle (yearlings) were enrolled in a test of performance, carried out from September 2011 to June 2012, in Uberlandia, MG, Brazil. The test was 224-d long (after a 70-d adaptation period) and the cattle were managed in a single group to graze *Brachiaria* spp. pastures, receiving free choice protein mixtures. During this phase, the animals were weighed each 28 d, and ultrasound carcass traits, scores of conformation (C), precocity (P) and muscling (M) and scrotal circumference (SC) were determined in the beginning and the end of the test. Following the first phase, the cattle were housed in individual pens and had the dry matter intake (DMI) and average daily gain (ADG) measured during the following 54-d period (after a 14-d adaptation period). In the beginning of the feedlot phase, the cattle were 19-month old and 370 kg of initial body weight (BW) in average. Cattle received a total mixed ration containing 73.5% TDN and 14.5% CP (dry basis). Based on DMI, BW and ADG, the residual feed intake (RFI) was calculated and cattle were divided into three RFI classes, representing the low-RFI class (high feed efficiency, $RFI < -0.5 \times \text{standard deviation}$), medium-RFI class (intermediary feed efficiency, $+0.5 \times \text{standard deviation} < RFI < -0.5 \times \text{standard deviation}$) and high-RFI class (low feed efficiency, $RFI > +0.5 \times \text{standard deviation}$). Analysis of variance was carried out following a complete randomized design. Low-RFI cattle showed lower ADG in the growing phase than medium- and high-RFI cattle ($P < 0.05$, 0.578 kg d^{-1} vs. 0.582 kg d^{-1} vs. 0.716 kg d^{-1} , respectively). No differences among RFI classes were observed for birth weight, initial and final BW in the first phase, BW adjusted at 550d, SC and C, P and M scores ($P > 0.05$). Furthermore, there were no differences across RFI classes for initial and final ribeye area, ratio (ratio between ribeye area height and width), backfat thickness, rump fat thickness and marbling ($P > 0.05$). Nevertheless, greater rib eye area adjusted for 100 kg BW was observed for Low-RFI cattle, when compared to medium- and high-RFI animals ($P < 0.05$). In Brahman cattle, higher feed efficiency in the feedlot may be associated with lower weight gain and greater degree of muscling in the previous growing phase on pasture.

Keywords: animal breeding, *Bos indicus*, feed efficiency, growing phase, tropical grass