Relationship of feed efficiency indexes and profitability in Nellore steers

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Feed intake in feedlots can represents around 77% of total daily cost, thus improving feed efficiency can directly lead to the greater profitability in production systems. The objective of this study was to evaluate feed efficiency measurements (residual feed intake – RFI and residual intake and body weight gain - RIG) and their relationships with profitability in feedlot. Eighty-four animals were individually fed twice daily with 5% of orts, during 84 days with a 60% concentrate diet   (2.7 Mcal of ME per kg DM). Animals were evaluated for performance and body composition (*Longissimus* muscle area-LMA, and backfat depth). Profitability of each animal was obtained by subtracting expenses from revenues during the backyard period. Daily gain (DG) was estimated by slope of the individual regression between BW and days on feed. RFI was obtained using mixed models in which metabolic BW and DG were included to predict the feed intake. The RIG was calculated as -1 x RFI + RG, both standardized to a variance of 1. The slope coefficient for each variable against RFI and RIG was studied and animals were classified in efficient, intermediate and inefficient RFI and RIG animals (mean ± SD 0.5). Correlations analysis between feed efficiency traits, performance, average daily gain, feed intake, body composition and profit were made by analyzing the partial correlation coefficients of Spearman. There was no association between RFI and body weight (P>0.05) and average daily gain (P>0.05), but efficient animals consumed 16.1% less feed (P<0.0001). Efficient-RIG animals consumed 11.7% less feed (P<0.0001), but with greater average daily gain compared to the inefficient animals (P<0.01). There was no association between RFI, RIG and average metabolic weight (P>0.05). Efficient animals for RFI and RIG had lower production cost resulting in increased profit (P<0.01). Profit was strongly associated with feed intake, RIG and weight gain (r = - 0.81, 0.72 and 0.61; P<0.0001), whereas its association with RFI was lower (r = - 0.46, P<0.0001). RIG was not associated with final live weight, but was positively correlated with average daily gain (r = 0.402; P<0.05), which explains the higher association with profit than RFI. The profit showed a significant association with LMA (P<0.05), showing that animals with greater deposition of muscle tissue are associated with greater profitability. Efficient animals for RFI and RIG are more profitable with small increases in muscle content, and that profit is better related to RIG than RFI.

Keywords: Residual feed intake; Residual feed intake and gain