

## A proposed selection index for feedlot profitability based on estimated breeding values

R.R. van der Westhuizen and J. van der Westhuizen

ARC-Animal Production Institute, Irene, South Africa

Corresponding author: R.R. van der Westhuizen

E-mail: [bobbie@arc.agric.za](mailto:bobbie@arc.agric.za)

Genet. Mol. Res. 8 (2): 448-455 (2009)

Received February 21, 2009

Accepted March 9, 2009

Published April 22, 2009

**ABSTRACT.** It is generally accepted that feed intake and growth (gain) are the most important economic components when calculating profitability in a growth test or feedlot. We developed a single post-weaning growth (feedlot) index based on the economic values of different components. Variance components, heritabilities and genetic correlations for and between initial weight (IW), final weight (FW), feed intake (FI), and shoulder height (SHD) were estimated by multitrait restricted maximum likelihood procedures. The estimated breeding values (EBVs) and the economic values for IW, FW and FI were used in a selection index to estimate a post-weaning or feedlot profitability value. Heritabilities for IW, FW, FI, and SHD were 0.41, 0.40, 0.33, and 0.51, respectively. The highest genetic correlations were 0.78 (between IW and FW) and 0.70 (between FI and FW). EBVs were used in a selection index to calculate a single economical value for each animal. This economic value is an indication of the gross profitability value or the gross test value (GTV) of the animal in a post-weaning growth test. GTVs varied between -R192.17 and R231.38 with an average of R9.31 and a standard deviation of R39.96. The Pearson correlations between EBVs (for production and efficiency traits) and GTV ranged from -0.51 to 0.68. The lowest correlation (closest to zero) was 0.26 between the Kleiber ratio and GTV. Correlations of 0.68 and -0.51 were estimated between average daily gain and GTV and feed conversion ratio and GTV, respectively. These results showed that it is possible to select for

GTV. The selection index can benefit feedlotting in selecting offspring of bulls with high GTVs to maximize profitability.

**Key words:** Beef cattle; Feed intake; Genetic (co)variances