



Study of genetic parameters for feedlot profitability related traits in Nelore Cattle

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Advances in precision livestock farming have fostered the use of high-throughput phenotyping, facilitating enhanced monitoring in animal improvement, research, and genetic applications (Silva et al., 2021). Additionally, precision livestock technological solutions can enhance production system efficiency, enabling opportunities to select animals more efficiently through automated phenotyping (Brito et al., 2021). This study aimed to estimate (co)variance components and genetic parameters for accumulated profitability (APF) and profit per each 15 kilogram of liveweight gain (PFT) in the feedlot, as well as their relationships with weight at 450 days of age (W450), rib eye area (REA), dry-matter intake (DMI), and frame score (FRAME). Data on profitability from 3,614 animals of the Nelore breed (*Bos indicus*) were used. The phenotypes analyzed were accumulated feedlot profitability (APF) and feedlot profit per each 15 kilogram of liveweight gain (PFT) from @Tech's algorithms which are designed to make full use of this data, ideally collected within a standardized 80-day trial period for running in the BeefTrader® Decision Support System generating the phenotypes. The algorithm uses animal traits as input variables (gender, breed, body condition score, initial weight, initial date, among other exogenous factors that impact on growth dynamics), daily weights individually collected through a weighing sensor (daily basis), and information on the nutritional composition of the diets. The (co)variance components and genetic parameters were estimated using Bayesian inference in multiple-trait animal model. The posterior means of heritability estimates for APF and PFT were 0.18 and 0.02, respectively. APF and PFT exhibited moderate to high genetic correlations with growth traits (W450) (0.51 and 0.64), ribeye area (0.43 and 0.44), dry-matter intake (0.72 and 0.26), and frame (0.44 and 0.77). These results offer important information to improve productive and economic performance when considering the inclusion of APF and PFT complementary tools in the selection criteria. Such traits can be strategic tools for producers by identifying animals with more significant genetic potential for profitability supporting decision-making in genetic planning and herd management.

Keywords: profitability, feedlot, Nelore, genetic parameters, livestock precision

Acknowledgments: Graduate Program in Animal Science at the Federal University of Goiás (UFG); The National Association of Breeders and Researchers (ANCP, Ribeirão Preto, Brazil) and @Tech Company (Piracicaba, Brazil); The São Paulo Research Foundation (FAPESP – 2022/04423-2)