Focus on Efficient Red Meat Production

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Utilizing Elanco's Benchmark Feedyard Performance database, 24,427 steer and heifer lots (4,056,148 head) closed between May 2016 and April 2018 were evaluated to determine key drivers of cash-to-cash Profit and Loss (P&L) basis. For this analysis, P&L basis is defined as the difference between each lot P&L and the mean weekly P&L for the region in which the lot closed. Utilizing a basis value in lieu of the nominal P&L removed the effect of macro swings in feedyard profitability from this this analysis. The relative contribution of differing variables to P&L basis were determined utilizing forward stepwise regression (Prob to enter = 0.25 and Prob to leave = 0.10) of lot level P&L basis on performance and market data variables. The final model R2 = 0.763 with the three leading variables (purchase price, sales price and Average Feed Conversion (AFC)) explaining 59% of P&L basis variation. Lot level AFC explained approximately 10.6% of P&L basis variation making it the single most economically relevant feedyard production metric.

Despite the economic contribution of feed efficiency to overall feedyard profitability and a focus on genetic selection metrics such as residual feed intake, lot level AFC across the industry has either increased (heifers) or improved very modestly (steers) over the past 17 years. Between 2000 and 2017, AFC conversion among feedyards participating in Elanco's Benchmark Feedyard Performance Database increased 0.044lbs and decreased 0.01lbs in heifers and steers, respectively. However, it is important to consider AFC in the context of dynamic industry days on feed (DOF) given that AFC increases as cattle are on feed longer. Over the past 17 years DOF has increased 29.3 days in steers and 13.4 days in heifers.

A better approach to evaluating efficiency would be to control for endpoint using a metric such as Empty Body Fat (EBF). Guiroy et al. 2001[1] published the following EBF equation using commercially available carcass data:

EBF = 17.76207 + [4.68142 * BF (cm)] + [0.1945 * HCW (kg)] + [0.81855 * QG Adjusted] – [0.6754 * REA (cm)]

BF = Back fat, HCW = Hot Carcass Weight, REA = Ribeye Area and QG Adjusted = Avg. Marbling Score/100 + 1

Applying this formula to the 4,056,148 individual carcasses closed in Elanco's Benchmark database over the past two years resulted in a mean lot-level average EBF of 30.3 with the 25th and 75th percentile equal to 29.8 and 31.0, respectively. In addition the mean within lot standard deviation of EBF values was equal to 1.35 indicating a high degree of within lot variation in degree of carcass finish. Cattle were then further stratified at the lot level by sex, placement weight (100lb weight group) and EBF index (in 1 whole unit increments) to determine the mean AFC and range of AFC within each group. Despite this level of segmentation, the interquartile range (difference between 25th and 75th percentile) of lot level AFC was over 0.50lbs even when controlling for in wt, sex and degree of end point finish (i.e. EBF). Obviously, variation in individual animal AFC within these cohort groups would be even greater. These data suggest that ample opportunity exists to make significant genetic progress in efficiency.

In addition, consideration should be taken in driving genetic improvement in efficiency relative to the targeted carcass to produce. Empty body fat targets would provide such guidance. While commonly used, residual feed intake fails to consider the "widget" the commercial cattle feeder is incented to produce. New selection criteria that measure efficiency relative to end point targets should be considered.

Guiroy et. al. 2001, Predicting individual feed requirements of cattle fed in groups. J. Animal Science