

Selection for Carcass Traits: New Tools

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It is well recognized that multiple-trait selection for economically important traits is a key component for profitability in a beef enterprise. The beef industry has done an excellent job of identifying traits that are important, and for many of these traits we have collected the necessary data and generated EPDs. As a result, for many breeds there are between 10 and 20 traits for which EPDs are available. Although these EPDs are excellent tools for making genetic selection, the task of placing selection emphasis on several of these EPDs simultaneously is a challenge. Perhaps even more daunting, is the task of prioritizing and placing proper weighting on those EPDs deemed most important.

For these reasons, multi-trait selection indexes have recently been developed by the beef industry. These indexes allow for selection for several traits simultaneously. For each trait contained in the index, both genetic and economic values are considered, and the end result is a comprehensive value that represents overall economic merit of the animal. This adds simplicity and convenience to selection decisions. In a nutshell, indexes utilize currently available EPDs, assign economic weightings to these EPDs based on expected revenue, and also incorporate estimates of costs associated with inputs required to achieve added performance.

The majority of the selection indexes that have been developed to this point have related to post-weaning performance and carcass merit. The following will examine a few of these new indexes and provide a short description of each.

Angus \$F (Feedlot Value)

The \$F value is the expected average difference in progeny post-weaning feedlot performance compared to progeny of other sires. \$F is expressed in dollars per head and incorporates weaning weight and yearling weight EPDs. Typical feedlot gain value, feed consumption and cost differences are accounted for in the final calculations, along with a standard set of industry values for days on feed, ration costs and cash cattle price.

Angus \$G (Grid Value)

\$G value is the expected average difference in progeny performance for carcass grid merit compared to progeny of other sires. The \$G index combines quality and yield grade factors, and is calculated for animals with carcass EPDs, ultrasound EPDs, or both. A three-year rolling average is used to establish typical industry economic values for quality grade and yield grade (premiums for Prime, CAB and Choice carcasses, as well as YG 1 and 2; discounts for Select and Standard quality grades, and discounts for YG 4 and YG 5). \$G is also expressed in dollars per head.

Angus \$B (Beef Value)

\$B is composed of both \$F and \$G and is a multi-trait genetic selection index for both feedlot performance and carcass merit. Specifically, \$B represents the expected average dollar-per-head difference in progeny post-weaning performance and carcass value compared to progeny of other sires.

In calculating \$B, expected carcass weight and its value are calculated, along with production cost differences. \$B is not simply the sum of \$F and \$G, as adjustments are made to avoid double-counting weight between feedlot and carcass segments.

Charolais Terminal Sire Index

The Charolais TSI is similar to Angus \$B in that it ranks sires based on their genetic merit for post-weaning performance and carcass merit. The Charolais Terminal Sire Profitability Index utilizes an interactive on-line tool generate dollar indexes per specific inputs provided by the user. Inputs include weaning weight, projected ADG for backgrounding/grower/finishing phases, live prices, and carcass premiums/discounts. In this manner, the TSI can be calculated to fit the needs of each individual operation.

Interpretation of index values in bull selection is very similar to using EPDs. For example, a \$10 difference in \$B value between two bulls would indicate an average of \$10 difference in progeny profitability when the calves are fed post-weaning and marketed on a carcass value grid. The relative difference between animals is of most interest, as the breed average values for these indexes are not necessarily zero.

So how can these index EPDs assist us in bull selection? The index values can be very useful, particularly for traits such as carcass merit. The immediate importance of carcass merit for an individual herd will largely be dependent on an operation's marketing scheme (retained ownership vs. selling feeder cattle), current genetics, management, and other factors. However, a common challenge for all producers is placing proper selection emphasis on the individual carcass traits that are available (marbling, REA, fat thickness, retail product EPDs). The advantage of index EPDs is that they combine the effects of this large number of carcass EPDs and put them into one understandable, easy to use number. By using industry averages for premiums/discounts and costs of production, the individual EPDs that comprise the index are weighted accordingly.

Certainly, there are some challenges to using these indexes that have been discussed here. These post-weaning/carcass indexes consider are terminal sire indexes, and are intended as predictors of slaughter progeny performance. They should not be used as the sole selection tool for producing replacement females, as they largely do not consider maternal genetics.

In summary, these new index EPDs offer great opportunity to enhance selection. Carcass traits need to be considered along with the many other economically important traits (reproduction, growth, maternal ability) in a balanced trait selection scheme. Currently, for many cow-calf producers, carcass traits carry significantly less importance economically compared to reproduction and growth. As advances are made in marketing systems and animal identification, genetic merit for carcass merit is becoming increasingly important for all producers- even those currently not retaining ownership. Consequently, carcass traits need attention in today's selection programs so that producers may position themselves for the future. With these new indexes EPDs, that process has been simplified.