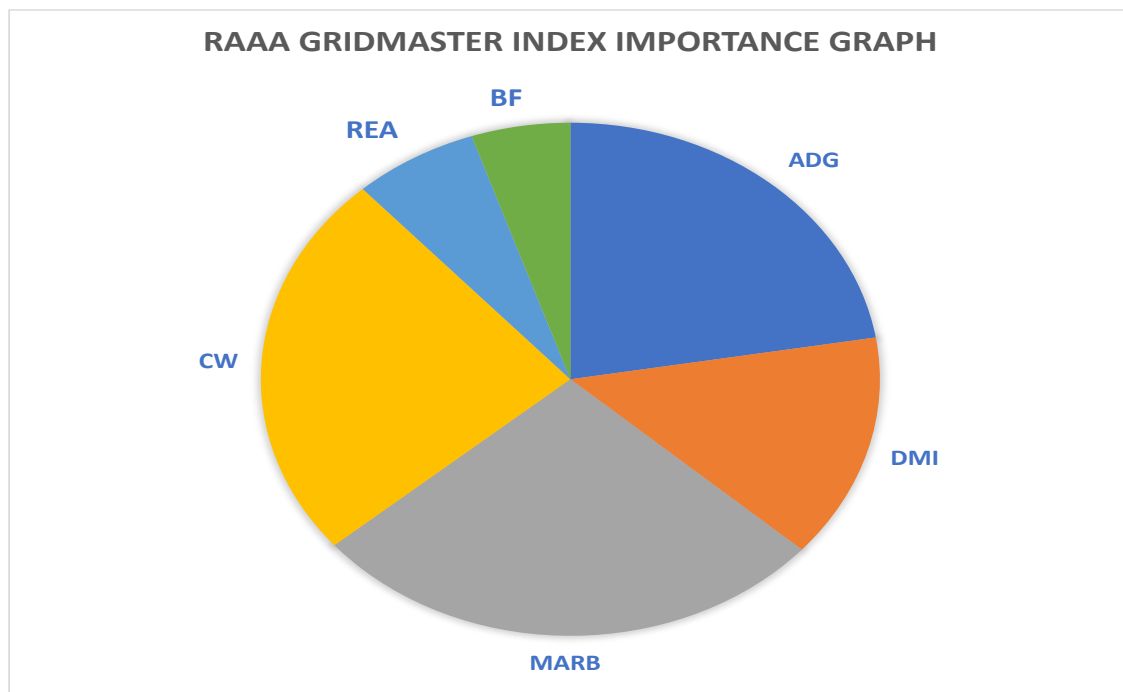


What is the GridMaster (GM) Selection Index?

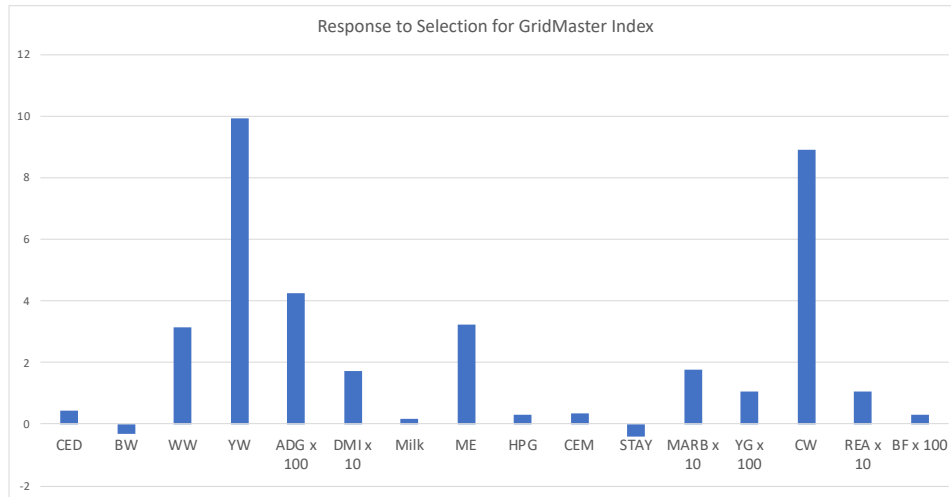
GridMaster is a terminally focused selection index that predicts the average economic difference of non-replacement progeny through the post weaning and harvest phases of production. Therefore, traits that are used in the GM index include: Average Daily Gain, Carcass Weight, Dry Matter Intake, Marbling, Back Fat, and Rib Eye Area. This index is expressed as \$ per head born.

The following model assumptions are used for the updated GridMaster index. After weaning, an industry average of 85% of the non-replacement progeny will be backgrounded as yearlings before entering the feedlot. The remaining 15% of non-replacement progeny will enter directly into the feedlot as weaned calves. These calves are then finished and sold on a quality and yield based grid. For this phase of production each trait in the model is then weighted based on its influence in profitability. Using the 500 most used sires over the last 5 years, the following chart illustrates the general weighting of traits within the GridMaster index.



The biggest driver of the resulting index value includes traits that influence carcass quality and weight. While this index places emphasis on increasing gain and carcass quality, the model also includes Dry Matter Intake to select for more feed efficient animals. GM also includes Rib Eye Area and Back Fat which are important for determining carcass yield grades.

Another way to examine the updated index is a response to selection graph (as seen below). This graph provides the expected result of EPD change that would occur if selection was carried out based solely on the selection indexes. The resulting change would be shown after one standard deviation of improvement of the index was achieved.



With the goal of the index being to improve post weaning performance, selection on this index will move post weaning traits in a favorable direction. Not all traits in the graph above are directly included in the index. However, genetic relationships do exist among these traits so selection on the index will lead to slight changes in these traits indirectly.

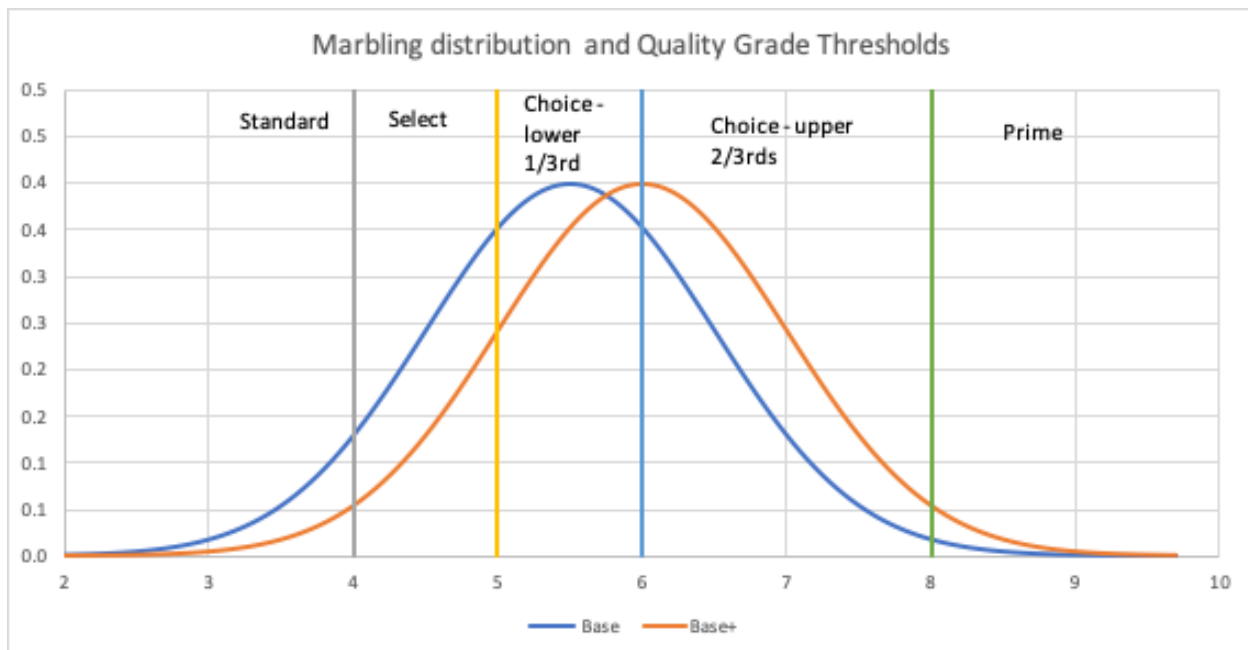
How is the updated GridMaster different than the previous GridMaster?

One of the major goals of the index update was to use more current economic inputs to better reflect market conditions. For the updated GridMaster index, 5-year rolling industry averages will be used. Information for these prices were sourced from data published by USDA and CattleFax. Pricing assumptions that are important for the calculation of the updated GridMaster index can be found in the following table.

Trait	Price
Carcass Price	\$196.45
Calf Fed/Yearling Fed%	15/85
Average Carcass Weight	860.88
Prime Premium	\$14.27
Upper 2/3 rd choice Premium	\$2.05
Select Discount	-\$12.79
Standard Discount	-\$31.16
Yield Grade 1 Premium	\$3.70
Yield Grade 2 Premium	\$1.76
Yield Grade 4 Discount	-\$11.40
Yield Grade 5 Discount	-\$25.00
Carcass Heavy Weight Discount 950-1000	-\$1.57
Carcass Heavy Weight Discount 1000-1050	-\$7.29
Carcass Heavy Weight Discount >1050	-\$22.84

Another improvement in the updated GridMaster Index is the incorporation of the Carcass Weight EPD. In the previous GridMaster selection index, weaning weight and average daily gain EPDs were used to evaluate differences in post weaning gain performance. In the updated model a blend of average daily gain and post weaning carcass weight gain are used to determine differences in post weaning weight gain. A discount is applied in the carcass weight portion of the model based on the percentage of expected progeny carcasses that will receive heavy discounts at slaughter.

A third improvement in the updated models is the use of non-linear coefficients for several of the traits. When cattle are marketed on a grid, value is determined by where they fall into distinct categories. An example of this is Quality Grade premiums and discounts. Within the index calculations, a base distribution of progeny performance is assumed and differences in EPDs will lead to a shift in the distribution. The resulting economic value for these traits is then determined by what proportion of progeny fall within each category. Within the updated GridMaster model, traits that use this approach include Marbling, Rib Eye Area, Back Fat, and discounts for heavy carcasses. A visual representation for this method, using Marbling, can be found in the following figure.



Another advantage of the updated Gridmaster index is that the standard deviation is much larger than the previous GridMaster index. This change will allow animals to receive the same published index value but potentially a very different percentile rank. The added increase in the standard deviation is also a better representation of the differences in economic values. This should allow commercial customers to identify the differences in terminal merit among a group of bulls more easily.

While the update includes other modeling enhancements, the changes listed above should be the largest drivers for differences in resulting index values. With these changes, the correlations to the previous GridMaster index and the updated Gridmaster index are 0.84 within the 500 most used sires for the last five years.