**What is the HerdBuilder (HB) Selection index?**
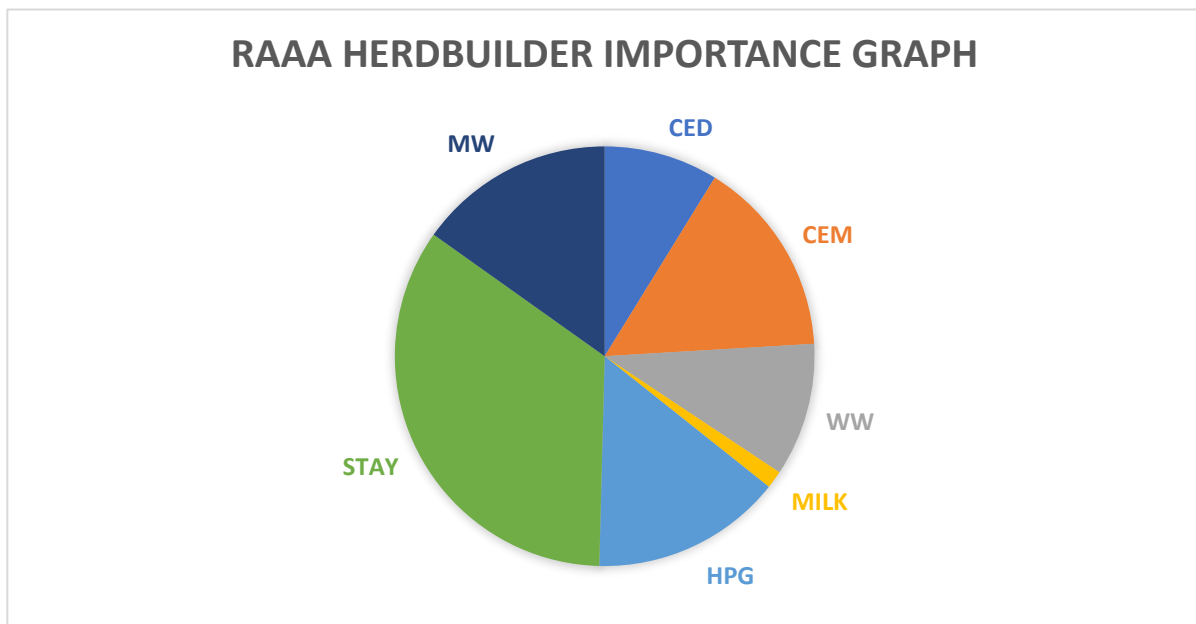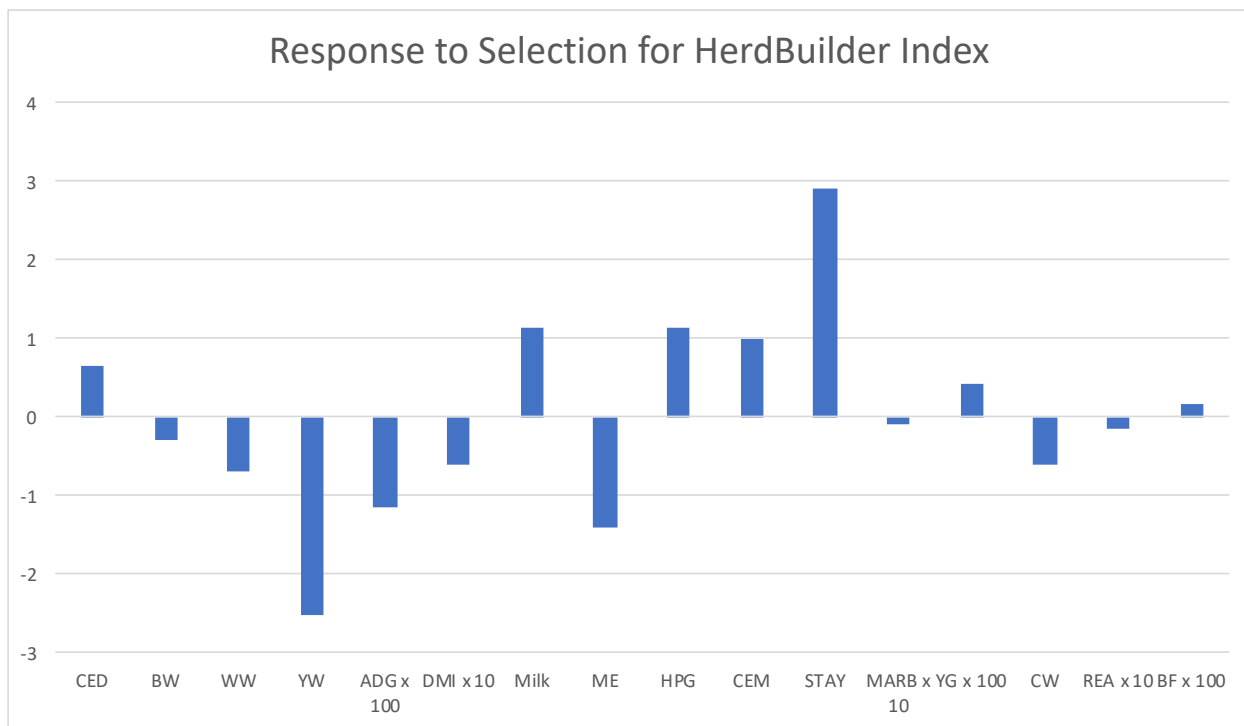
HerdBuilder is a maternally focused selection index that predicts differences in profitability for traits that are economically important from conception to weaning. The traits that are used in the HB index include: Calving Ease Direct, Calving Ease Maternal, Weaning Weight, Milk, Mature Weight, Heifer Pregnancy, and Stayability. This index is expressed as $ per head born.

Under the model assumptions for the HerdBuilder index each bull will sire 100 calves in his lifetime. A portion of the female calves will be retained as replacements and the remaining non-replacement females and male calves will be sold. Within the herd, both Red Angus and other terminal sires will be used in a crossbreeding system. However, a high percentage of the replacements will be retained from the Red Angus sire. EPDs that are included in this index are designed to help producers identify bulls that will maximize the profitability of the cow-calf herd from conception to weaning. Each trait included in this index is economically weighted based on their impact on overall profitability. Using the 500 most used sires over the last 5 years, the following chart illustrates the general weighting of traits within the HerdBuilder index.



Within the updated index, the resulting HB value is largely driven by traits that are centered around the female. This emphasizes increasing fertility and longevity in the female, and includes a negative weighting on mature weight to reduce mature cow size.

Another way to examine the updated index is a response to selection graph (as seen below). This graph provides the expected result and direction 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.

Response to Selection for HerdBuilder Index

With the goal of the index being to improve maternal traits, selection on this index will increase traits such as CEM, HPG, and STAY. This index does put a negative weighting on mature weight to reduce mature cow size. 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.

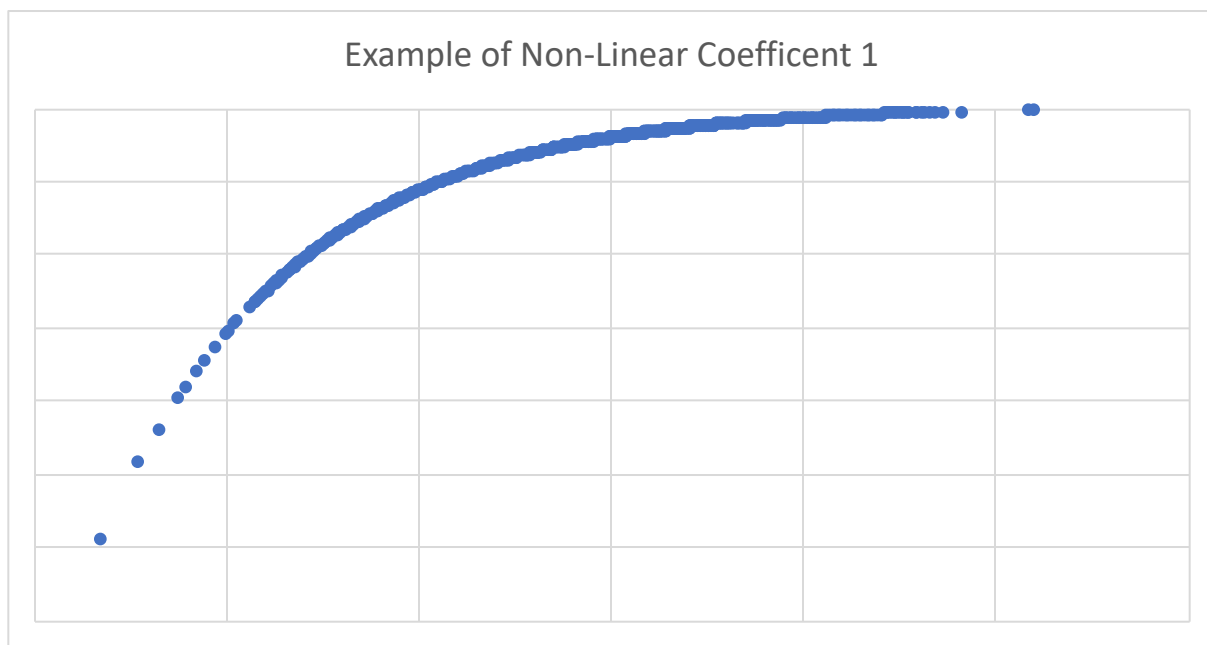**How is the updated HerdBuilder different than the previous HerdBuilder?**

One of the biggest changes in the updated HerdBuilder model is that only traits from conception to weaning are used. Previously, HerdBuilder included post weaning traits in the calculations. In the index updates, the post weaning and pre-weaning traits will be incorporated into a new index called Profitability and Sustainability with the acronym ProS.

With the update to HerdBuilder, economic assumptions in the model will be revised to include 5 year rolling industry averages for prices. This information is compiled from reputable national databases provided by USDA and CattleFax. With the update, these prices will be recalculated once per year to reflect more current market prices. Some of the more influential pricing assumptions used in the HerdBuilder model can be found in the following table.

| Trait | Price |
|---|---|
| Cow/heifer mix | 78/22 |
| Percent of calves born unassisted | 93% |
| Weaned Steer Price ($/cwt) | $191.95 |

| Weaned Heifer Price ($/cwt) | $168.81 |
| --- | --- |
| Breeding Heifer ($ per head) | $1733.68 |
| Cull Cow Carcass Price ($/cwt) | $70.38 |
| Grass Hay ($/ton) | $139.95 |
| Alfalfa ($/ton) | $164.15 |

Another update to HerdBuilder is that several traits will now have non-linear coefficients used for index value calculation. These traits would include Calving Ease Direct, Calving Ease Maternal, and Milk. An example of what the shape of the economic increases across a range of EPDs would look like, is illustrated below.



Example of Non-Linear Coefficent 1

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 HerdBuilder index and the updated HerdBuilder index are 0.86 within the 500 most used sires for the last five years.