

Separating science from politics and marketing

Red Angus unveils reliable, unbiased indices

By Larry Keenan, Director of Breed Improvement

The Red Angus Association of America (RAAA) implements a unique approach when developing genetic selection tools. In order to deliver the most reliable and unbiased data to Red Angus stakeholders, RAAA separates sound science from subjective politics and marketing.

RAAA achieves this through implementation of a non-political Technical Committee, which is populated by non-Board members and actually has decision-making powers regarding genetic predictions.

Once the technical committee is provided an assignment – such as developing economic selection indices – it is tasked with overseeing development and ultimately deciding if the tool – or index in this case – is dependable enough to release to stakeholders. While this process may slow the release of a new EPD or index, commercial producers can have confidence that once the tool is released, it is reliable.

Red Angus' work on economic selection indices provides an excellent example of the importance of such committee structure. RAAA previously had the ability to release an index; however, Technical Committee review revealed flaws in the proposed index that essentially caused it to be a marketing tool as opposed to a selection tool.

After multiple refinements to the index development software, RAAA is excited to announce that the Technical Committee has approved the release of the HerdBuilder and GridMaster indices.

What are Indices?

The purpose of an index (plural – indices) is to estimate differences in an operation's overall profitability resulting from a particular selection decision. In developing an index to evaluate differences in profitability within an operation, assumptions must be made regarding the genetics of the cowherd (ex: average weaning weight) as well as economic values (ex: sale price of cull cows).

RAAA utilized the Red Angus database to determine the required cowherd assumptions. The economic assumptions were derived from input obtained from CattleFax and economic data from Texas A&M and North Dakota State University. Additionally, certain basic production assumptions are made, such as: Will the bulls be used on heifers and/or cows? Are replacement heifers retained? When and how are calves marketed?

Once these assumptions were determined, the data was fed into a simulation model that accounted for the segments of the beef industry based on the assumptions. Finally,

EPDs of the service sires were included in the simulation model to determine the overall impact the sires would have on the operation's profitability.

The EPDs included in the index calculation are independently changed one unit (ex: Stayability EPD of 10 vs. 11), and the resulting change in overall profitability determines the weightings placed on each EPD. It is important to understand that these EPD weightings are not determined, or adjusted, using human perceptions. Thus, the weightings, and ultimately the indices, are completely based on science.

While the process of calculating an index is very complex, the resulting selection tool is very simple to implement. RAAA's indices will be expressed to stakeholders as differences in profitability per exposure. For example, Bull A has an index value of 100 and Bull B has an index value of 150, and the selected bull would be mated to 120 cows over the bull's productive lifespan. Selecting Bull B would add an additional \$6,000 $[(150 - 100) \times 120]$ in profitability to the operation as compared to selecting Bull A.

While Red Angus bulls are selected by stakeholders to fit into various production scenarios, selection pressure is typically placed on herd-building traits or traits that increase the value of marketed product. Many producers have even developed their own selection index to assist them in identifying bulls that meet these goals. Typically these include thresholds for certain EPDs, but as most would admit, these thresholds are not strictly followed. Red Angus' selection indices will provide producers with a consistent selection tool built on a scientific, unbiased foundation.

HerdBuilder Index

As the name indicates, implementation of the HerdBuilder Index will assist producers in building profitable herds. The HerdBuilder Index is built using the following production scenario:

- Red Angus bulls mated to cows and heifers (resulting progeny $\frac{3}{4}$ Red Angus, $\frac{1}{4}$ Simmental)
- Replacement heifers retained from within the herd
- All remaining progeny sold on a quality-based carcass grid.

Given that replacement heifers are retained, significant influence is placed on the obvious maternal EPDs of Stayability, Heifer Pregnancy and Calving Ease. Additionally, with all remaining progeny sold on a quality-based carcass grid, Marbling, Yield Grade and growth EPDs impact the HerdBuilder index.

GridMaster Index

While Red Angus has traditionally been known as a superior maternal breed, those who have retained ownership in Red Angus calves know of their potential to excel in the feedyard and ultimately hang a premium carcass.

Red Angus stakeholders will quickly recognize the term “GridMaster,” as the Marketing Department annually recognizes load lots of harvested cattle with superior carcass observations as “Grid Master” Award winners.

Producers who place emphasis on the GridMaster Index in their selection decisions will not only experience an increase in their operation’s profitability; but as well can expect to see an increased number of calves recognized as Grid Master Award winners.

The GridMaster Index is built using the following production scenario:

- Red Angus bulls mated to cows (resulting progeny $\frac{3}{4}$ Red Angus, $\frac{1}{4}$ Simmental)
- All progeny sold on a quality-based carcass grid.

Thus, Marbling, Yield Grade and growth EPDs are the traits of primary importance in the GridMaster Index.

What if my Production Scenario is Different?

While your operation may differ from the above index scenarios, our research shows that the two above situations will serve as reliable selection tools for the vast majority of ranches. For example, if your operation matches the HerdBuilder Index, except you would be using the selected bull on cows only, this small difference would not cause a significant change in the ranking of animals.

During committee discussions, the Technical Committee explored creating an additional HerdBuilder-Cow Index, which would use the same scenario as the above HerdBuilder except the bulls would only be used on cows. In comparing the HerdBuilder vs. HerdBuilder-Cow indices, we found that bulls ranked essentially the same between the two indices.

To be exact, the rank correlation was 0.97, which can be interpreted as only 3 in 100 bulls changed rank between the HerdBuilder and HerdBuilder-Cow. Thus demonstrating the robustness of the HerdBuilder Index, in that your production scenario can slightly deviate from the exact scenario in which the HerdBuilder Index was built, and the HerdBuilder Index can still serve as a reliable selection tool.

A quick study of the HerdBuilder and GridMaster Indices reveals that the main difference between these two indices is the source of replacement heifers. If the selected sire will be used to produce replacement females, the HerdBuilder Index should be used. However, if the selected sire will not be used to generate replacements, the GridMaster Index should be used.

Red Angus’ unwavering implementation of science has provided the foundation for the delivery of genetic selection tools with unmatched reliability. This precedence was strictly followed in the development and delivery of Red Angus’ HerdBuilder and

GridMaster indices. Thus, stakeholders can have confidence that these new tools are truly genetic selection tools, and not just a marketing tool.

Sidebar #1

Red Angus Association of America Core Policy No. 3

The standing policy of the RAAA is that when the science exists to make a genetic prediction more precise and reliable, the science is implemented. This is overseen by the Technical Committee and not the Board of Directors.

Sidebar #2

Key Points to Remember

- The purpose of an index is to estimate differences in an operation's overall profitability resulting from a particular sire-selection decision.
- EPD weightings – and ultimately indices – are not determined, or adjusted, using human perceptions but are completely based on science.
- While the process of calculating an index is very complex, the resulting selection tool is very simple to implement.
- Red Angus' selection indices will provide producers with a consistent selection tool built on a scientific, unbiased foundation.
- Use the HerdBuilder Index if the selected sire will be used to generate replacement females.
- Use the GridMaster Index if you are not retaining replacement heifers from the selected sire.