

Project Summary

Genomic Economic Selection Indexes for Enhancing Carcass Value

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Pfizer Animal Genetics

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Background

Beef producers are inundated with large amounts of information when selecting bulls. As genomic information becomes more accessible, the potential volume of resources at producers' disposal could expand exponentially. Although a large amount of information allows for more informed decisions, too much information can make decisions very difficult. One approach to strategic data reduction is the use of bioeconomic indexes that combine several useful traits into a single value that can be readily interpreted on an appropriate scale. Researchers at Pfizer Animal Genetics have developed a selection index that incorporates genomic predictions for multiple traits for use by U.S. beef producers.

Methodology

The index developed assumes that cattle will be on feed for 161 days or until they reach a backfat depth of 0.46 inches, whichever is achieved first. Molecular value predictions (MVP) are expressed in the currency of estimated breeding values (EBV), meaning that they express the total genetic merit of an animal. Half of an MVP would be equivalent to the currency of an expected progeny difference (EPD) and expresses the amount of genetic merit that can be transmitted to an animal's progeny. Similarly, because the index consisted of seven MVP, the index value needed to be divided by two in order to equate the value to the amount of genetic merit that can be passed to the offspring. Following development of the index, a real world industry population was used for validation. This population consisted of 1,115 carcasses sired by 21 bulls each with a minimum of 10 progeny in the dataset.

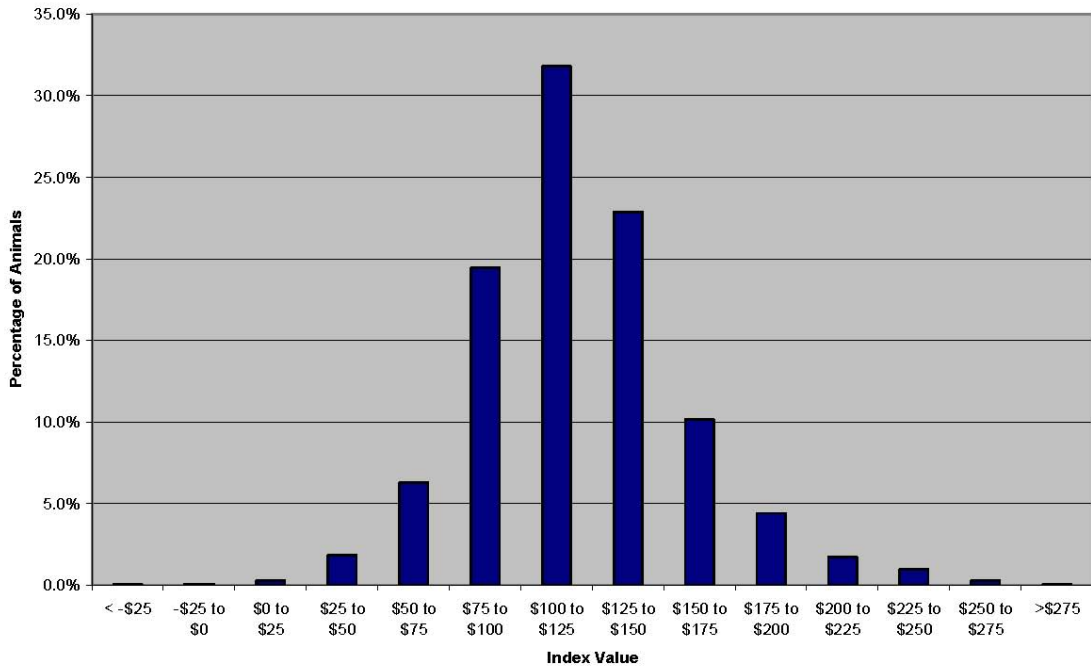
Findings

The same grid values were used for both development of the index and validation. The index that was developed has been implemented for approximately 6,000 animals summarized in Figure 1. Sires were divided into high and low groups based on their index value. The difference in marbling score between predicted and actual progeny scores was small, indicating a high degree of association between predicted and observed progeny characteristics. When carcass weight was considered in carcass value, the difference in predicted performance of the two groups based on the index was \$0.40 per carcass illustrating the accuracy of the index.

Implications

This index took into consideration the complete profit potential of feedlot animals being sold on a value-based grid by evaluating both carcass attributes that determine carcass value and the growth rate and feed input required for an animal's progeny in the feedlot. This index is best suited for producers that are selecting bulls to produce progeny that will enter the fed beef supply chain. Importantly, this index may not be suitable for niche markets where underlying assumptions and carcass valuation may differ considerably. Further research should be conducted to determine appropriate indexes for specific niche markets.

Figure 1. Distribution of Animals Based on Index Value



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