BEEF CATTLE RESEARCH UPDATE

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Using Genetic Testing to Improve Fed Cattle Marketing Decisions

Genomics is being increasingly used in selection of breeding stock. It is best used in that application to enhance accuracy of Expected Progeny Difference (EPD). The technology can also provide livestock producers with a range of genetic information including parentage assignment, detection of genetic defects, and genetic markers, for qualitative traits, such as hide color, and quantitative traits, such as marbling score.

An Oklahoma State University study used data from feedlot cattle to estimate the expected value of genetic information at the feedlot stage.[1] Data for 9,465 commercially fed cattle from six different Midwestern feed yards were use in this study. The cattle represented year-round placements in 2007 and 2008. At placement, animals were weighed and a hair sample or tissue punch from ear tag application was collected for genetic testing. Genetic information was provided in the form of molecular breeding values for seven traits: yield grade, marbling, average daily gain (ADG), hot-carcass weight, rib-eye area, tenderness, and days-on-feed. This information was used after feeding and slaughter data were collected to evaluate how implementing genomic predictions at the start of finishing would have affected financial returns. To determine the value of genetic information for improving fed cattle marketing decisions, three baseline marketing scenarios were created in which all cattle were marketed in a single group on a live weight, dressed weight, or grid basis. These baseline scenarios were compared with alternative marketing scenarios in which additional information was used to enhance fed cattle marketing decisions. The genetic information marketing scenario used the results of genetic testing to sort cattle into marketing groups based on their expected performance.

The cattle had an average initial weight of 700 lb. The average growth and carcass performance on the cattle was: ADG = 3.39 lb/day, 176 days on feed, dressing percent = 62.7%, Yield Grade = 2.70, and 54% graded Low Choice or higher. The results indicated that using genetic information to sort cattle into marketing groups reduced expected net returns for live weight and dressed weight relative to their respective baseline scenarios. However, the ability to identify animals that will perform poorly at slaughter and pull them off of the grid increased expected net return for grid pricing by more than $11/head. As a result, overall expected net return for the genetic information marketing scenario compared with the grid baseline marketing scenario increased. The expected value of genetic information for a producer currently marketing cattle in a single group using grid pricing was $1.35/head. The researchers noted that while this value is relatively low that it is important to remember that few producers currently market all of their cattle on the grid, as a result of higher variability. The value of genetic information for producers currently using live weight or dressed weight pricing was $9.16 and $7.57/head, respectively.

These authors also reported that in addition to improvements in expected net returns, using genetic information to sort cattle into marketing groups also resulted in efficiency gains to cattle feeding. For example, relative to their respective baseline scenarios, optimal days-on-feed decreased for live weight and dressed weight pricing and increased for grid pricing.

This indicated that when sorted and targeted to their optimal marketing method, animals with lower genetic potential for marbling could be fed for fewer days and animals with higher genetic potential for marbling could be fed slightly longer to achieve more favorable quality grade outcomes.

These results suggest that sorting cattle (using genetic information) when placed on feed would reduce variability or risk when marketing on a grid. The authors concluded "using genetic information to sort cattle into marketing groups (live weight, dressed weight, or grid pricing) and to determine optimal days-on-feed increased expected net returns by $1 to–$13/head, depending on marketing method and grid structure". Genomic tests for production and carcass traits currently cost from about $20-40/head, depending on what traits are included, but costs are declining as techniques and efficiency are improved.[2]

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[1] Thompson, N. M., E. A. DeVuyst, B. W. Brorsen, and J. L. Lusk. 2016. Using Genetic Testing to Improve Fed Cattle Marketing Decisions. J. Agric. Resour. Econ. 41: 286-306.

[2] Hammack, S. 2017. Beef Cattle Browsing Newsletter. Vol. 22, No. 8. Available at: https://animalscience.tamu.edu/beef-cattle-browsing-vol-22-no-8/