

Beef Herd Genomics

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Genomics is mapping and sequencing of genetic material in the DNA of a particular organism and the use of that information to understand gene function, their control, and their location on the chromosome. Dr. Ellis indicates Genomics is the latest Bovine technology and has the potential of enabling faster herd genetic change in food producing animals. Since 1994, the University has been mating the best to the best for genetic improvement of the herd.

grade, marbling score, yield grade, hot carcass weight, rib eye area, fat thickness, tenderness, feed efficiency, longevity, calving ease, docility, coat color, heifer pregnancy and breed specific horned or polled. Their results are easy to understand because it is a numerical score from 1 to 10. Higher scores toward 10 for all traits do not necessarily mean that 10 is better for all cases, it merely means that the animal has the potential for more of that trait. For example if a producer wants to select for leaner cattle he would not select a 10 because that would add backfat. Also a producer may not want to select



Dr. Ellis explains to students how to properly collect a tissue sample from the calf. The tissue will be used to evaluate the DNA of the calf for Igenity comprehensive beef profile.

The DNA technology will permit individual mating of cows to proven bulls that have been evaluated for their DNA. The result will be faster genetic progress to produce a more consistent product, superior heifer selection, and prediction of feeder cattle performance for higher quality beef.

Southeast Missouri State University is completing DNA sampling of their cows, replacement heifers, and fall born calves at the David M. Barton Agriculture Research Center. DNA analysis is the most recent technology for determining the actual genotype of a bovine. Scientists have recently advanced the DNA sequencing technology. This has allowed more accurate genetic evaluation of food producing animals much earlier in their lifespan. That is the reason Southeast is DNA sampling their calves that were born in the fall of 2008. The research is a cooperative project between Southeast Missouri State University and with Roger Eakins of the University of Missouri Extension and Outreach Service and Igenity, a registered trademark of Merial, Duluth, Georgia. Igenity will conduct the DNA analysis of each tissue sample.

Members of the Animal Breeding and Physiology course at Southeast Missouri State University initiated the process when they collected the DNA samples. The class could have pursued the options of collecting blood, tail hair or tissue from each animal. The class decided to conduct the tissue punch. Students restrained the animal, cleaned dirt and oil from the sampling region, and prepared the ear tagging type pliers for the collection of the tissue. The pliers supplied by Igenity have retainer clips to hold the sample container. Students have to position the ear of the animal between the two tag parts of the loaded pliers. Class members squeezed the collection tool quickly and firmly. Next they detached the sample container. After collection, the loaded sample is ready to be documented and mailed to Igenity with the completed order form. Students documented the animal's Farm ID and the bar code number from the sample container on the enclosed order sheet. The process places a bar code tag in the cow's ear. Students utilized the Farm ID and tissue bar code for sample identification. The tissue samples were then mailed to Igenity. Each sample has a cost of \$34.20.

Igenity will return to the class the DNA score for the following traits. Comprehensive beef profile from Igenity contains these traits: quality

the most lean because of harder doing cows. The most informed decisions used Igenity profiles in conjunction with other selection tools like conformation and EPD's. Select the scores which are best for your animals and management. The results will be customized for the David M. Barton Agriculture Research Center Beef Herd.

Application of these results will permit individual mating of each herd female. Igenity assists with this mating by sorting of the beef herd DNA with benchmark software that compares one's results to nearly one half a million animals in their database. Producers who utilize the Comprehensive DNA technology will receive a code that will permit them to use the sorting software. There is no further cost for the software. The University will use this software to place emphasis on certain traits. The decisions as to the traits to be emphasized for genetic improvement have not been formalized by Roger Eakins and Dr. Ellis. Igenity software will permit these researchers to place emphasis on one or various traits. One may decide to improve the herd genetically for marbling score, feed efficiency, longevity, and calving ease. The software would place 25 percent emphasis for each of these traits or different percentages depending on researcher goals. Next, Igenity has a large data base of bulls that have been DNA sampled and their comprehensive DNA analysis is published. Also most bull breeding companies have a comprehensive DNA analysis available on all their semen sires. The software will list the sires that could be used for rapid genetic improvement of selected traits.

The field trial at the David M. Barton Agriculture Research Center has been initiated by University of Missouri Extension and Outreach plus Southeast Missouri State University to demonstrate applied usage of new DNA technology. Further classes at Southeast will be involved with the trial additionally Roger Eakins plans to hold a Field Day focusing on the Genomic technology. For further information contact either Roger Eakins at 573-243-3581 or Dr. Ellis at 573-651-2797. Mention of trade names does not indicate endorsement or imply that their performance is superior to other similar products. Δ

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