

2007 Beef Improvement Federation 39th Annual Meeting

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Whole-Genome Approach

by Eric Grant

FORT COLLINS, COLO. (June 8, 2007) — A new technology, called the “Illumina iSelect Infinium Custom Beadchip,” could potentially revolutionize the way cattle producers identify economically important genes and allow them a “whole genome” approach to determining the genetic merit of cattle without dependence on phenotypic measurements.

The beadchip, developed with help from researchers at the University of Missouri, provides for “whole genome” investigations of the bovine genome. Expected to be commercially available this fall, the technology could accelerate the ability of researchers to cost-effectively unlock the genetic basis of dozens of traits, and allow the industry a greater breadth of understanding of the range of genes that affect specific traits, said Jerry Taylor, professor and Wurdack chair for animal genomics at the University of Missouri (MU).

Taylor introduced the concept June 8 to attendees of the 2007 Beef Improvement Federation (BIF) annual conference in Fort Collins, Colo.

“We’ve taken 5,000 DNA samples from bulls at Circle A Angus and 1,800 samples



PHOTO BY MATHEW ELLIOTT

► “If there are 59 genes in Angus that are responsible for the genetic differences in marbling and marbling scores, then we need to test for all 59 genes,” said MU’s Jerry Taylor.

from AI bulls,” Taylor said. “We’ve genotyped 4,000 animals and identified 422 markers. From this research, we’ve found evidence for 59 individual marbling genes. If there are 59 genes in Angus that are responsible for the genetic differences in marbling and marbling scores, then we need to test for all 59 genes. If we’re going to do that, you need a test that

encompasses the entire genome, not just parts of it.”

“The test could also help producers accurately predict the EPDs (expected progeny differences) for all traits — without having to take measurements or weights,” he said. “It will also provide for parentage verification and traceability. There is an enormous range of applications.”

Cost of the test is currently at \$208 per sample, for research purposes. Taylor expects the costs to drop in the future to make it more economically feasible for producers and breed associations to use.

A potential downside of the technology is that each test is breed-specific. In other words, “the test we develop for Angus won’t work for Salers,” Taylor said. Each breed will have to make some investment to develop their own, breed-specific test in the future.

“If this proves to be effective, we will have to repeat the analysis for all breeds — and all the breeds that want to use it will have to pony up,” he said.

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Look for the PowerPoint and audio file for this presentation in the newsroom.



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