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21ST CENTURY GENETICS: RISING TO THE CHALLENGE SOUTHERN STYLE

Matching Genetics with Environment

by Micky Wilson

CHOCTAW, MISS. (April 20, 2006) — Tom Jenkins of the Roman L. Hruska U.S. Meat Animal Research Center (MARC) at Clay Center, Neb., presented information about matching beef genetics with the production environment at the 2006 Beef Improvement Federation (BIF) annual research symposium.

When matching cattle to an environment, the first consideration is whether the cattle are capable of converting to beef under the given conditions, Jenkins said. If there is a disconnect between the cattle and the environment, a need is created to alter the environment to suit the cattle; actions such as this may be counter to producer profitability. Using appropriate genetics minimizes the need to modify the environment.

“Broadly defined,” Jenkins said, “the production environment is made up of all non-genetic drivers from all segments of the horizontally integrated United States beef cattle industry.”

Producers can match genetics with environment, Jenkins said, by using either genetic improvement programs or structured mating systems.

“Management decisions regarding breeding programs can be made once a phenotype is identified that increases profitability of the ranch through cost-effective modification of the production environment,” Jenkins explained.

The goal of a breeding program is to create progeny appropriate for the mer-

chandising program and to produce females that are genetically suited to the local environment, Jenkins said. “This variation may be utilized by mating systems designed to exploit breed differences and increasing the fit to the environment by using heterosis.”

Jenkins presented eight items to consider to successfully match cattle genetics with the environment:

- 1) identify your merchandising plan;
- 2) identify your most limiting environmental factor;
- 3) identify phenotypes that provide an advantage;
- 4) identify breeds or animals that overcome limiting factors;
- 5) define an objective measure of traits that overcome limiting factors;
- 6) determine if traits are under genetic control;
- 7) design and implement a breeding program to increase frequency of desired genotypes; and
- 8) sustain genetic diversity.


“Implementation of these steps reflects a commitment to an underlying philosophy of management to improve profitability through optimizing resource use rather than one of maximizing revenue through environment modification,” Jenkins concluded. 



PHOTO COURTESY USDA MARC

Trying to modify the environment to accommodate mismatched genetics can be counter to producer profitability, Tom Jenkins of USDA MARC told attendees of the 2006 BIF annual research symposium.