

Improving Feed Efficiency Genetically

3:30 p.m. session, Tuesday, Dec. 6, 2005

Presenter: Mark Allan, USDA-ARS, Clay Center, Neb.

RAPID CITY, S.D. (Dec. 6, 2005) — While improved feed efficiency is desired by most cattle producers, and it is considered a moderately heritable trait, there has been minimal progress in understanding the genetics of feed efficiency. However, according to geneticist Mark Allan, technology has been developed to better implement genetic selection for energy efficiency.

A researcher at the Roman L. Hruska U.S. Meat Animal Research Center (MARC), Clay Center, Neb., Allan told Range Beef Cow Symposium attendees that previous attempts to select for feed efficiency frequently resulted in unintended increases in mature female body size. Bigger cows generally mean higher production (feed) costs. Another correlated, but unfavorable response, was increased calf birth weight.

The reason, Allan said, is that the most common measure of feed efficiency has been feed conversion ratio. When heavy selection pressure is placed on reducing feed intake:gain ratio, increases in mature weight and birth weights should be expected.

Presently, however, residual feed intake (RFI) is the trait of choice among most researchers. This measure of feed intake is not directly correlated with traits like growth rate and mature size, allowing selection for favorable feed efficiency without detrimental effects on other important traits. The downside is that no data currently exists to analyze the long-term consequences of selection for RFI.

Allan said experiments have been initiated at MARC to gather this much-needed data. The project includes a study of the variation in nutrient utilization in finishing steers and in breeding females.

In the short term, Allan said, the industry will see the development of feed efficiency expected progeny differences (EPDs), most likely from RFI. The first EPD for RFI will most likely be for the finishing phase. Allan warned producers that feed efficiency EPDs should be used with care. Extreme selection pressure for feed efficiency, using such an EPD without knowledge of correlated responses or long-term effects on fitness and adaptability could possibly lead to a less efficient cow herd.

“My gut feeling is that the most efficient feeding animal might not make the most



MARC has initiated experiments to look at the long-term consequences of selection for residual feed intake, said the center's Mark Allan. [PHOTO BY LYNN GORDON]

efficient cow,” Allan explained. “That is the reason for the female production efficiency experiment.”

A primary objective of the steer and female experiments is development of tools needed to create EPDs and identify gene markers to assist selection. Application of genetic markers should allow opportunities to improve the profitability of beef production through genetic selection for feed efficiency without measuring feed intake directly. If differences exist between cow efficiency and finishing efficiency, markers would allow producers to improve a specific phase of production.

— by Troy Smith, field editor, Angus Productions Inc.
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