



# 2006 National Angus Conference & Tour



## Improving Reproduction Genetically

by **Linda Robbins**

BOISE, IDAHO (Sept. 26, 2006) — “Traditionally, we looked at reproduction as something that was too hard to improve, mainly because the traits we measured were lowly heritable,” Mark Enns told attendees of the 2006 National Angus Conference & Tour. Rather than selecting for reproductive superiority genetically, producers, scientists and breed associations have focused on cow herd management, such as supplementation and body condition scores (BCS), as a means to improve reproductive performance.

But, driven by the fact that reproduction is the largest contributor to profitability in the cow-calf operation, that perspective is changing. Enns, assistant professor of animal sciences at Colorado State University (CSU), provided national conference participants an update on genetic evaluation to improve reproductive traits.

Enns first explained that heritability is an estimate of what portion of the difference in any trait is due to genetics as opposed to environment. As shown in Table 1, most reproductive traits are low in heritability. For example, a heritability estimate of 0.05 would mean only 5% of the difference in conception rate can be attributed to genetics.

Another complication, many reproductive traits are what researchers call “binary traits,” or questions with only two possible answers — yes or no. Cows are either pregnant or they’re not pregnant, Enns said as an example. To create a genetic prediction for a given trait, there has to be variation in that trait.

Despite low heritabilities, we can make genetic improvement in reproduction,” Enns said. New statistical technologies are overcoming some of the difficulties. The establishment of large databases by the dairy industry and beef breed organizations such as the American Angus Association helps



Mark Enns, Colorado State University, described current efforts to improve reproductive performance through genetic prediction.

develop these statistical models.

He noted that the percentage of heritability of the new reproductive rates are higher on an underlying scale, meaning that there are several genetic factors that influence whether or not a cow becomes pregnant during any one breeding season, and all of these other factors contribute to the underlying scale.

Providing examples of reproductive evaluations currently in use, Enns described the U.S. dairy industry’s daughter pregnancy rate expected progeny difference (EPD), which predicts the percentage of nonpregnant cows that become pregnant during each 21-day breeding period.

Australia is looking at days to calving and scrotal circumference, while U.S. beef breeds are establishing EPDs for scrotal circumference, heifer pregnancy and stayability (see Table 2).

To listen to Enns’ presentation and/or view his PowerPoint®, visit the newsroom at [www.nationalangusconference.com](http://www.nationalangusconference.com).



**Table 1: Estimated heritabilities of reproductive traits**

Trait	Heritability
Calving date	0.06
Calving interval	0.11
Conception rate	0.05
Calving rate	0.09
Days to calving	0.08

**Table 2: Evaluations for reproductive ability currently available in the U.S. beef industry**

Breed	Traits evaluated
Angus	Scrotal circumference
Red Angus	Heifer pregnancy, stayability
Limousin	Scrotal circumference, stayability
Gelbvieh	Stayability
Simmental	Stayability
Brangus	Collecting data for stayability
Hereford	Scrotal circumference

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