

Marbling or Functionality?

You Can Have It All

A literature review by a Kansas State University research team confirms good news in sire selection circles.

BY STEVE SUTHER

You just marketed a load of steers on one of those value-based marketing grids that pays premiums for higher quality and yield. Trouble is, the discounts more than offset the premiums on this, the first set of cattle on which you've retained ownership. The discounts show you what to avoid, but for what target should you aim?

As it happened, the cattle were ready at a time of year when the price spread between Choice and Select is usually wide and in an area where local premiums for *Certified Angus Beef*[™] carcasses doubled in the last year.

"One thing for sure," you tell your neighbor, Doubtful Dave, in one of those window-to-window pickup conferences, "I need to get more marbling into my cattle. That's what the market is telling me."

Dave counters. "Do that and you can kiss cow herd efficiency goodbye. Is your goal to make more money for your ranch or for the packer?" he asks. "You'd best worry about increasing your weaning weights and reproductive efficiency — that's where you make *your* money. Even if you do retain ownership, you can't afford to sacrifice red-meat yield to chase more marbling."

■ Good news

According to a report by T.T. "Twig" Marston, Kansas State University Extension beef specialist, Dave may be groundlessly pessimistic. Marston has analyzed existing research data and summarized the results in a white paper entitled "The Impact of Selecting for Marbling on Beef Cow Herds." The bibliography lists 61 research articles. The report suggests you really can increase marbling in a herd while making progress in other economically important traits as well.

The research by Marston, Extension assistant J.F. Gleghorn and graduate student L.E. Wankel was sponsored by the Certified Angus Beef (CAB) Program to answer these kinds of questions and to counter the

conventional wisdom of the Doubtful Daves of the world.

Marston's group started with the premise that pricing cattle on an individual animal basis rather than pen averages makes those traits related to the end product (beef) more valuable to the cattle feeder and breeder. It follows that producers with documented high-quality cattle will have increased bargaining power and, hence, profit.

"Net profit [to the commercial cow-calf producer] will rise," Marston says, "only if a balance can be achieved between product quality/value and cow herd production costs." Though beef quality has been a concern for decades, the market has not paid enough premiums to divert producer attention from growth,

reproductive traits and cow maintenance costs. Indeed, the latter concerns will continue as major factors in cow herd profitability, Marston says.

Through attention to those traits, producers have substantially reduced their costs. But the decrease in consumer demand for commodity beef has renewed the need for placing emphasis on quality. Producers need not give up their gains in cow herd efficiency to pursue quality, Marston's literature review suggests.

■ Need genetic propensity to marble

Conventional wisdom has long held that the way to get more marbling is to feed longer. That may be true with generic, commodity cattle — but feeding cattle of unknown type to a high-marbling end point can be a recipe for financial disaster. Many cattle feeders can relate to that by experience without need of a literature review. Still, there is no reason to suggest that higher grading cattle are always less profitable. You have to know what you're feeding.

"Marbling is a major contributor to determining carcass quality," Marston says.

"Like other production traits, [it] is controlled by genetics and environment." But the genetic side is more critical to marbling than, say, to weaning weight or calving percentage.

The average of 14 studies shows marbling has a moderate to high heritability factor of 0.43, so genetic progress is a worthy goal. "Marbling has to be bred into the offspring; it cannot be fabricated from a special environment," Marston points out.

Feed additives or growth promotants are more likely to hinder marbling than to promote it, so cattle must first have a genetic propensity to marble and then be managed to an optimum end point to realize their potential.

■ Multiple traits

Conventional wisdom has long held that selection for marbling is a shortcut to the poorhouse. That may be a result of misinterpretations of linear studies or ill-fated pioneer efforts at single-trait selection. Regardless of the feature, single-trait selection has been proven a bad idea — but that need have no bearing on selection for marbling, Marston's review points out.

Multiple-trait selection is no secret. Some individuals may think it is boring; but, like driving down the middle of your lane on a highway, it will get you where you want to go much more satisfactorily than the excitement of repeated crashes. There is little or no evidence, Marston found, that including marbling ability in your array of selection criteria will set back any of the other growth or reproductive traits.

■ Rumors not grounded

You may have heard that propensity to marble affects puberty in heifers, but several studies found no relationship between the two traits. You may have heard calves that will marble will not wean as heavy as leaner types, but studies actually show a positive correlation between marbling and preweaning gain, Marston says. That implies a relationship between dam milk production and marbling, but no research data has confirmed such an effect.

Research does show that cows with greater genetic potential to milk have metabolic rates that demand more energy for maintenance than lower-milking contemporaries, but that is an issue aside from marbling. "Actually, we know little about the peculiarities of dams that possess high-marbling genes," Marston notes, but an Iowa State University research herd will soon begin to provide relevant data.

There often has been talk that, if you select for marbling, your cows will lose reproductive efficiency. However, what



T.T. "Twig" Marston

limited research data there is shows neither a positive nor a negative correlation between marbling and pregnancy rates, Marston notes.

What about the other carcass traits? “Because of the relationship between marbling and overall fat accumulation, there appears to be an antagonistic relationship between marbling and cutability across breeds and within some breeds,” Marston acknowledges. However, a summary of American Angus Association data completed this year shows only a minimal correlation (-0.04) between marbling and percent retail product — so Angus breeders can select for both quality and quantity of red meat.

Moreover, since the genetic correlation between fat thickness and marbling is near zero, Angus breeders should be able to maintain both marbling and the “do-ability” of an easy-fleshing cow herd, Marston says. (See sidebar, graphs and table.)

No matter what direction cattle breeders want to move their herds in terms of marbling, Angus bulls are available to positively affect other important traits at the same time. This simultaneous selection is necessary because producers cannot afford to sacrifice performance to reap carcass premiums.

■ Rely on data

“Considering multiple traits simultaneously would minimize many of the unfortunate scenarios being reported from field observations,” Marston points out. “Breeders need to rely heavily on the American Angus Association’s *Sire Evaluation Report* and visual observations of type and kind.

“Accurate data collection is the cornerstone of the system,” he adds. “Assembly of the data into organized information and turning that information into concrete knowledge are the most efficient ways to improve cattle breeding and meet the demands of our consumers.”

It turns out to be a good news/good news story: Consumers want you to produce cattle that do it all in terms of retail product. Your prosperity depends on finding cattle that can do it all in terms of performance. The American Angus Association’s *Sire Evaluation Report* and database point toward the cattle that can do it all, for both producer and consumer.

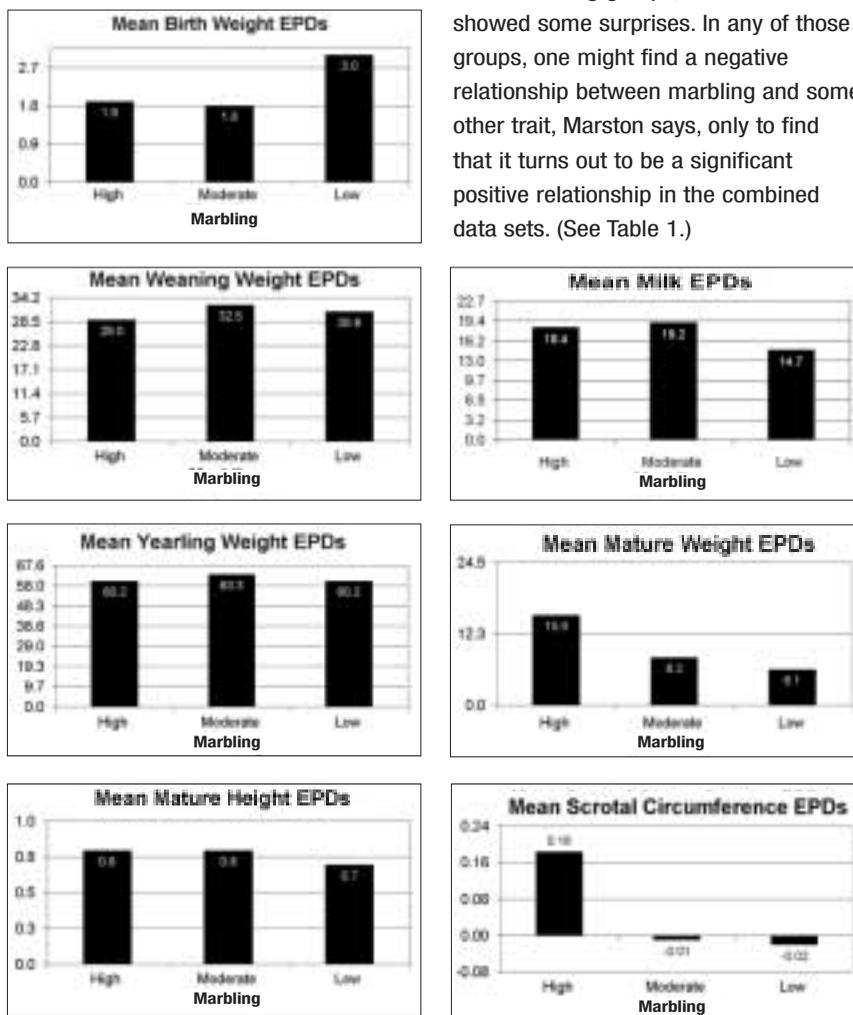
For a complete white paper of the literature review, contact the CAB Program’s Supply Development branch at 1107 Hylton Heights Rd., Manhattan, KS 66502; (785) 539-0123, or e-mail ssuther@cabprogram.com.



Sire summary shows opportunity

Kansas State University researchers T.T. “Twig” Marston, J.F. Gleghorn and L.E. Wankel analyzed data on bulls listed in the Spring 1999 Angus *Sire Evaluation Report*, seeking to determine the correlation between marbling expected progeny difference (EPD) and other performance traits on 145 high-accuracy (≥ 0.80) marbling bulls listed.

Figure 1: Statistics for the high (≥ 0.34), moderate (0.06 to 0.12) and low-marbling (-0.11 to -0.57) EPD Angus bulls used in correlation analysis.



Seventy-five sires representing the highest, lowest and moderate marbling EPDs were compared (see Figure 1). This showed similarities between the three marbling groups, but it also showed some surprises. In any of those groups, one might find a negative relationship between marbling and some other trait, Marston says, only to find that it turns out to be a significant positive relationship in the combined data sets. (See Table 1.)

Table 1: Statistics of the combined 25 high, 25 moderate, and 25 low-marbling EPD Angus bulls used in correlation analysis.

Trait	Mean	SD	Minimum	Maximum
Year of birth	1987.7	4.8	1973	1995
EPDs				
Birth weight	3.2	2.2	-2.5	6.8
Weaning weight	30.8	8.0	12.0	50.0
Milk	17.5	8.0	-7.0	35.0
Yearling weight	61.2	13.7	27.0	94.0
Combined maternal	32.9	8.7	13.0	52.0
Marbling	0.11	0.31	-0.57	0.76
Mature weight	10.0	26.9	-60.0	109.0
Mature height	0.8	0.5	-0.2	2.4
Scrotal circumference	0.04	0.61	-1.20	1.53

Source: American Angus Association, Spring 1999 *Sire Evaluation Report*.