Cows That Work, Calves That Grade

Research paper explores how carcass quality is related to reproduction.

by ***Miranda Reiman***

Many beef producers struggle with priorities when it comes to genetic selection. On one hand, they know the market rewards a focus on the end product. After all, consumers are the ultimate customers.

Then their skeptical side kicks in: "Yeah, but the most important thing is to get as many live, healthy calves as possible each year so the cows can earn their keep."

Those torn by this conflict of the mind can take heart in an updated research paper by Twig Marston, Kansas State University (K-State) Extension beef specialist.

Its long title indicates a comprehensive approach. "The Relationship Between Marbling and Other EPDs with Implications When Making Beef Cow Herd Breeding and Management Decisions" discusses how carcass quality is related to reproduction.

"For profits to rise, there has to be a balance between product quality, or value, and cow herd production costs," Marston says. "For several decades, there's been a movement toward value-based marketing, so marbling is an economically important trait."

Marston says finding that equilibrium should not be difficult.

"Marbling has to be bred into the offspring. It can't be fabricated from a special environment," he says. "Luckily, marbling is a moderate to highly-heritable trait. Reproduction, however, is not."

Although no research examines the direct relationship between marbling and reproduction, studies of other traits point the way.

In one example, Angus sire data were sorted into groups with expected progeny differences (EPDs) that were in the upper or lower percentiles for marbling score. "There was no difference in the age of puberty onset between the different sire groups," Marston says.

The American Angus Association's newly created heifer pregnancy (HP) EPD also supports this. High-accuracy sires show no correlation between HP and intramuscular fat (IMF), marbling or any growth trait.

"The data says you should be able to select for heifer pregnancy without affecting other traits," he says.

One study suggests marbling and milk EPDs have no effect on age at first calving, but there is a positive relationship between marbling and preweaning gain.

"That is quite favorable if you're looking to increase both weaning weight and marbling," Marston says. It follows that increased milking ability eventually increases the ability to marble, he adds.

"Mild correlations exist between lighter birth weights, easier calving and heavier milk production to greater marbling," he says.

In Angus populations, marbling ability isn't related to external fat thickness.

Table 1: Correlation coefficients between ultrasound IMF EPD and other traits of Angus bulls*

	Pearson correlation coefficient	P value
Year of birth	0.22	0.0001
Production trait EPDs		
Birth weight	-0.19	0.001
Calving ease direct	0.15	0.01
Calving ease maternal	0.11	0.05
Weaning weight	-0.08	0.19
Milk	0.17	0.002
Yearling weight	-0.04	0.50
Yearling height	-0.14	0.02
Scrotal circumference	-0.08	0.18
Mature weight	-0.07	0.04
Mature height	-0.05	0.38
Carcass trait EPDs		
Carcass weight	-0.08	0.17
Marbling	0.63	0.0001
Ribeye area	0.06	0.33
Fat	0.11	0.05
Ultrasound ribeye	0.16	0.007
Ultrasound fat	0.24	0.0001
Selection indexes		
$F	-0.03	0.65
$G	0.80	0.0001
$B	0.56	0.0001
$W	0.11	0.06
$EN	-0.12	0.04

*Among 304 sires with IMF EPD accuracy of 0.80 or greater, Angus Sire Evaluation Report, Spring 2007.

Note: This example shows the correlations between an indicator trait for marbling (IMF) and the range of other traits. There are generally three classifications for these: neutral, positive or negative, but the latter two can be slight, moderate or high. In addition, the "P value" refers to the statistical significance, where the smallest number goes with the most confidence in that correlation. To illustrate, there is a slight, negative correlation between IMF and mature weight, and a similarly slight, negative correlation between IMF and mature height. However, the higher P value for the mature height data tells us that relationship is not as dependable. On the other hand, IMF is strongly, positively correlated with $G, and the P value of 0.0001 indicates the highest level of confidence.

"That implies a breeder can match both marbling and doability to a particular management system," Marston says. However, trying to make progress with both traits may yield slower results than choosing one over the other.

The most efficient cows tend to be smaller in weight, stature and milk production, Marston says. "We'd expect marbling to be favored in these smaller cows, because the traits have a slightly negative correlation (see Table 1)."

In the Association's dollar value index ($Value) suite of tools, cow energy value ($EN) has only a slightly negative (-0.12) association with marbling.

"To maximize returns from tomorrow's marketing systems, producers will have to meet consumer demands in an efficient manner," Marston says. "Great genetic strides have been made in the improvement of efficient growth. Now it's time for producers to maintain the growth advantages and increase carcass quality."

Producer approaches

In adopting their approach to these issues, Marston says producers have sorted themselves into three categories.

"The first group loves their work and lifestyle, but oftentimes goes unrewarded financially because of changes in the market and production environment," he says. These are the farmers and ranchers "steeped in tradition."

►Relationships between cattle selection traits have been a major factor in improving production efficiency, Twig Marston, K-State Extension beef specialist, says.

A second group cuts cost with a focus on recordkeeping. They make data-driven decisions but often ignore the ultimate customer. "As long as there's a commodity market for beef, these producers will have an outlet," Marston says.

Cattlemen who are committed "food producers" have a greater chance of survival in today's industry, he says.

"They truly care about the consumers' wants and find ways to fill their needs. They're rewarded for their efforts and management," Marston says. "They anticipate and build the acceptance and demand for beef."

Marston's entire white paper is available at *www.cabpartners.com/news/research/marston_marblingandothertraits.pdf.*