



## Your Link to

by **MIRANDA REIMAN**, *Certified Angus Beef LLC*



### Tenderness and marbling go together

“You could cut it with a butter knife. It just melted in your mouth!”

The layman’s measure of tenderness is that easy-to-enjoy feeling of the beef in your mouth. But the ultimate experience pairs an equally satisfying burst of juices and unmatched smooth, beefy flavors with that tenderness.

You’ve tasted enough steaks to know the good ones, when everything falls into place.

But not all consumers know what to look for or even how to describe it. Fortunately the field of beef-product research has several tools to measure those traits, and recently two separate teams of scientists used them to determine how well meatcase marketing matches reality.

It turns out the beef quality grading system is right on the money, and the addition of branded programs in the past 34 years has made beef buying even more predictable.

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#### Put to the test

That’s the news out of Colorado State University, where highly respected meat scientist Daryl Tatum and his crew completed a beef checkoff-funded project that looked at how well camera-rated marbling scores correlate with eating experience.

“Marbling has kind of gotten a bum rap from a lot of people saying it really doesn’t predict much,” Tatum says. “But across the full range, it has predicative capabilities. When you can measure it precisely, it does a really good job. What we found was a really strong relationship between marbling and sensory properties in particular.”

There’s also a direct connection between Angus influence, as noted by “A-stamped” carcasses, and higher quality grades. Carcasses were camera-graded into seven different marbling scores, ranging from Traces to Moderately Abundant, or USDA Standard to Prime. Only 49% of those in the Traces category were A-stamped, compared to 92% in that highest classification (see Fig. 1).

#### Sensory panel

A trained panel evaluated steaks from all those ranges and, rather than assign positive or negative ratings, they were asked to quantify the presence of specific flavors, such as “meaty, brothy” or other descriptors. Panelists also gave ratings on tenderness, juiciness and the overall sensory experience.

Tenderness and “buttery, beef-fat” flavor accounted for 91% of the variation in overall sensory experience; in turn, 40% of tenderness variation and 71% of

variation in that desirable flavor was due to marbling score.

This is big news. The last major study of comparable type, done in the late 1970s and published in 1980, only showed that marbling controlled 24%-34% of most eating characteristics (see Fig. 2).

Similar 2011-published work at Oklahoma State University also used a trained panel and tested Warner-Bratzler Shear Force (WBSF). That standard measure of tenderness decreased linearly from 3.9 kilograms (kg) in Select product to just 3.1 kg in Prime (see Fig. 3).

As quality grades increased, so did juiciness and tenderness scores, and shear force values decreased.

That should send a clear message that the higher the quality grade, the better the beef.

#### Probability of a good experience

In fact, the Colorado work applied some interesting statistics: The probability of a positive eating experience within the Prime grade is 98%-99% (see Fig. 4). With Modest and Moderate degrees of marbling, the threshold for many premium Choice brands, the chance of a good eating experience is 82%-88%.

That’s in stark contrast to low-Choice at 62% or Select at 29%.

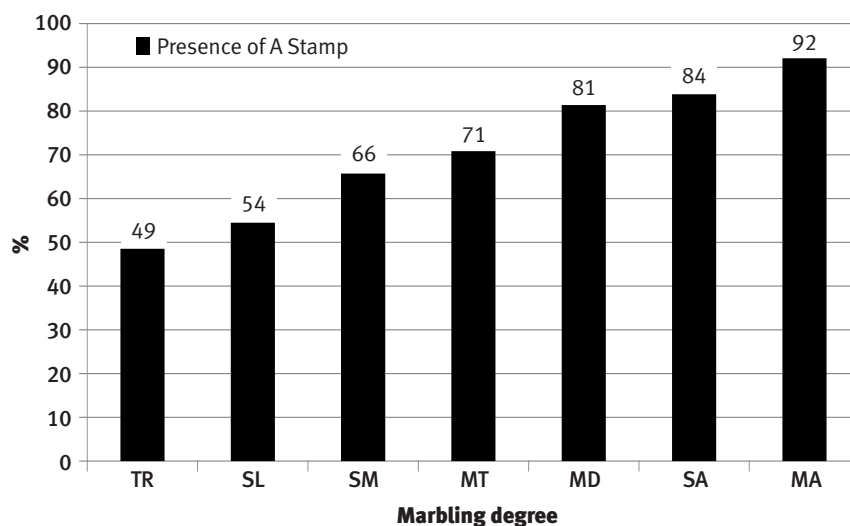
“The beef trade has it figured out. Prime is its own category and the upper two-thirds of Choice is another category by itself,” Tatum says.

Of course *Certified Angus Beef*<sup>®</sup> (CAB<sup>®</sup>) has both premium Choice and Prime lines, and both fetch higher prices than low-Choice in the grocery store. Yet, on the production side of the

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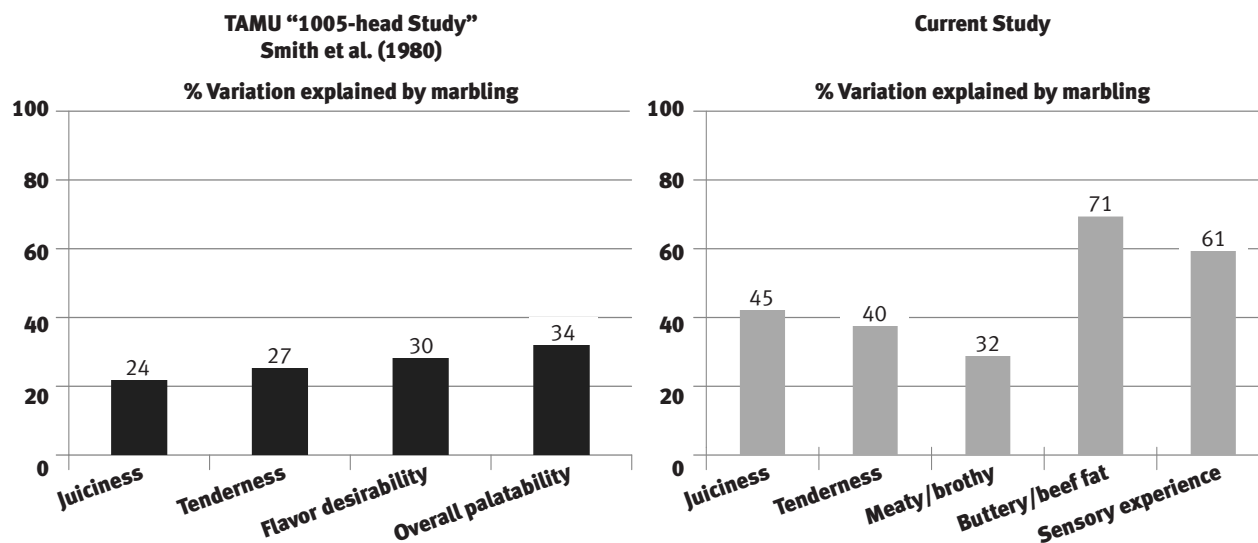
— *Daryl Tatum*

**Fig. 1: Percentage of carcasses in each marbling degree identified with an A Stamp**



Source: Emerson et al., 2011.

**Fig. 2: Variation in beef sensory attributes explained by differences in marbling**



Source: Emerson et al., 2011.

equation, the Choice-Select spread has long been touted as the key indicator of high-quality beef demand.

Although there was a sharp uptick during the last quarter of 2011, more often feeders have complained of its narrowness the past few years, grousing that the signal to produce higher quality is weak.

Undoubtedly, the Choice-Select spread is not the same measure it once was, before nearly 50 USDA-certified brands creamed the upper two-thirds Choice product off the top of that larger category.

What's left now is just a step above Select, and these studies prove that there are inherent eating quality differences between those marbling levels.

The Select-Prime spread is an alternative indicator of the demand picture for top-quality beef.

For 2010, the Prime-Select spread was \$32.70 per hundredweight (cwt.). Through September, the 2011 spread averaged \$37.55, a 15% increase, and it reached above the \$50 mark some

weeks — and that's even with export restrictions and a sluggish domestic economy.

Supply of Prime has been climbing, too, as overall marbling scores are up nationwide, yet it's still able to hold up that level of price support. That's because it's worth more, and shoppers know it.

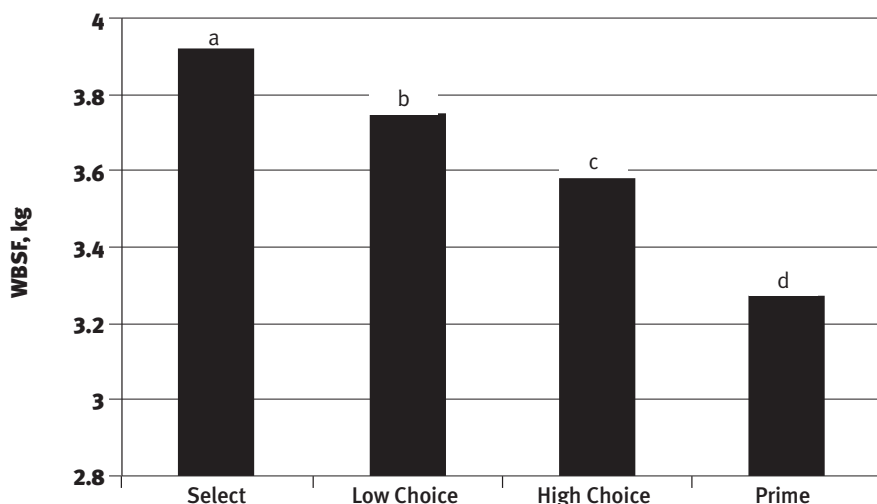
"If you're going out for that occasion where you're wanting to treat yourself, it's pretty important to have marbling in there," Tatum says. "It really performs on all levels when you do."

Call it an insurance policy, culinary security or better beef for your buck — this data shows when you buy CAB you need not set the dinner table with cutlery other than butter knives.



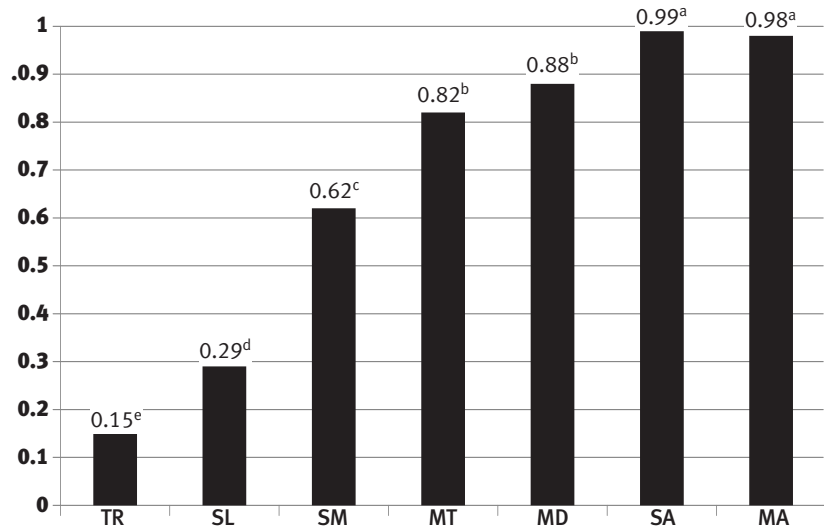
**Editor's Note:** *Miranda Reiman is assistant director of industry information for Certified Angus Beef LLC.*

**Fig. 3: Tenderness, as measured by Warner-Bratzler Shear Force, by USDA quality grade**



Source: Garmyn et al., 2011, JAS n89:2849-2858.

**Fig. 4: Effect of marbling degree on probability of a positive sensory experience**



Source: Emerson et al., 2011.