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Why quality grades are improving

Angus cattle have risen to dominate the U.S. beef supply chain because their owners and managers exploited the breed's ability to marble, independent of other economically important traits related to maternal and growth performance.

The market demanded more highly marbled beef, particularly in the last decade, and producers responded through genetics, management and marketing strategies. That explains part of a general 10-year upswing in beef marbling and quality grade.

A look at the history of quality grade trends in the United States reveals two overriding factors: functional shifts in the way quality grades are assigned, and economically driven cattle management enhancements. For more details on this retrospective summary, visit www.cabpartners.com/news/research.php.

As recently as 2006, the industry faced concerns about consumer demand for beef that lacked marbling in much of the product mix, with the weekly share of USDA Choice carcasses often dropping below 50%. The annual average for the 52 weeks managed only 51.7% Choice.

As much as these shifts affected grading, economics and cattle production factors played equally important roles.

Feeding management

When corn prices climbed to the area of \$7 per bushel (bu.) in 2011, many predicted a reduction in days on feed so that quality grades would decline. Neither happened.

Instead, a paradigm shift swept through the feeding industry, which used to worry about inefficiency at the end of

the feeding period. It turns out those last days produce only carcass weight and allow more marbling deposition to earn premiums by grid or formula marketing, which increased to more than 60% in the last 10 years. Faster-growing genetics, heavier placements, the growing use of beta-agonists and the shrinking supply of feeder cattle were supporting factors; all led to heavier carcasses.

The economics of cattle feeding shifted again in the summer of 2013.

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Quality grades in the 1970s and 1980s were noted much higher than in 2015, but many carcasses were not offered by packers for USDA grading in those years.

From that low, a remarkable upward trend began, producing annual increases in the share of fed cattle grading Choice each year with a minor correction in 2012. The 2015 average of 69.1% Choice was a 17.3-percentage-point improvement in annual grading. While the Prime grade had endured for years in the 2% to 3.5% range, that premium grade also jumped to 4.2% in 2014 and 5.1% in 2015. The first six months of 2016 saw a combined Choice and Prime grading share of 75.1%.

Quality grades in the 1970s and 1980s were noted much higher than in 2015, but many carcasses were not offered by packers for USDA grading in those years. Those not likely to grade Choice or Prime were simply marked "No Roll," a stark contrast to the present, when nearly all fed steer and heifer carcasses are assigned a quality grade. Today's practices create a more realistic total assessment of the grading mix and a more challenging field for Choice as a percentage of the whole.

Instrument grading, approved by USDA in 2006 and adopted by the industry beginning in 2009, has been a significant factor in the modern history of quality- and yield-grade assessment, vastly improving consistency and accuracy. It figures into grading trends since adoption and has ushered in a new era of trend analysis in beef quality.

Fig. 1: Carcass weight vs. quality grade

The share of Choice and Prime carcasses trend lines up with annual carcass weight increases since 2007, implying a correlation between the two.

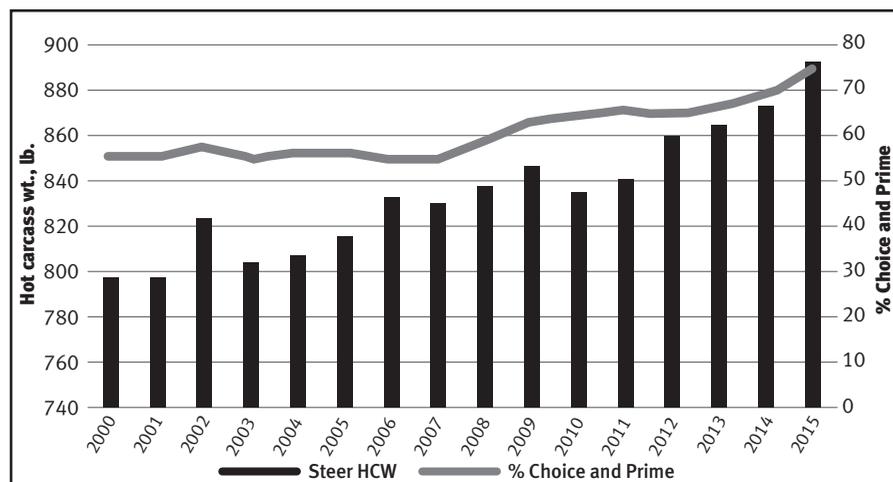
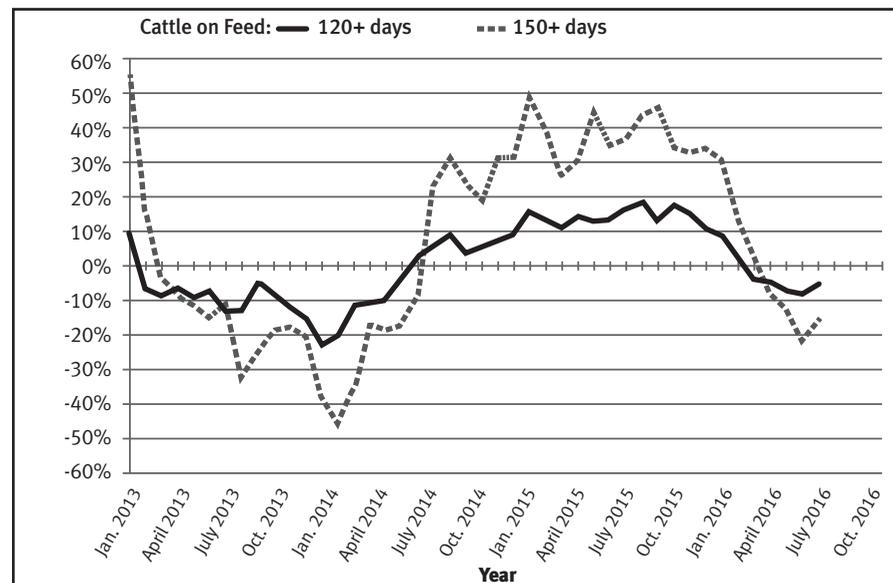


Fig. 2: Cattle on feed 120+ and 150+ days, % change vs. a year ago

Although fed-cattle prices moved much lower late in 2015, with another leg down this summer, corn prices also moved lower, averaging \$3.59 per bu. from July 2014 to December 2015. Corn worked its way lower still at the start of harvest in 2016, but with futures lower than a declining cash market for cattle, widespread bearishness among feeders curtailed the trend of more days on feed.



Source: Cattle Fax.

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Omaha corn plummeted from \$7.14 per bu. in early July to \$4.56 per bu. in late September, and distillers' byproducts also fell to open a historically wide gap between feedlot cost of gain and the cash live-cattle price.

A Kansas feedlot survey showed that gap widened from \$2.69 per hundredweight (cwt.) less than cash cattle for steers harvested in July 2013 to \$47.60 per cwt. lower for steers harvested in March 2014, after five months at the cost of gain.

Meanwhile, all cattle prices left their two-year trading ranges to shoot higher. Fed cattle had traded from \$112 per cwt. to \$130 per cwt. from June 2011 to June 2013, but broke to the upside that fall, really taking off the next year to reach

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\$171.38 per cwt. the week of Nov. 24, 2014.

Feeder-calf prices led that charge in 2014 to push the \$300 per cwt. late in the fall, and remained surprisingly strong through the next summer. Even

before that, risky breakevens and tighter credit after the Great Recession had curtailed feedyards' rate of buying new placements. Logic again said feed existing inventory longer, resulting in more compositional body fat and realizing virtually all marbling potential. Yield grades (YG) rose from 8.1% YG 4-5 in 2000 to 12.9% in those overfinished categories in 2015, because to gain more pounds of premium-quality beef, packers reduced discounts related to excessive YG and raised the limits on carcass weight.

As the overall supply of fed cattle declined from more than 30 million in 2000 to 22.6 million head in 2015,

Holsteins made up an increasingly greater share. Since they are typically fed on a high-concentrate diet from an early age, these cattle tend toward higher quality grades and certainly helped lift the trendlines.

However, the share of Angus genetics also increased over those years, and genetic quality advanced to more than double the annual acceptance rate for the *Certified Angus Beef*[®] (CAB[®]) brand since the low of 14% in 2006.

Genetic advancement

Angus cow-calf producers on both the seedstock and commercial

Fig. 3: Angus marbling EPD genetic trend

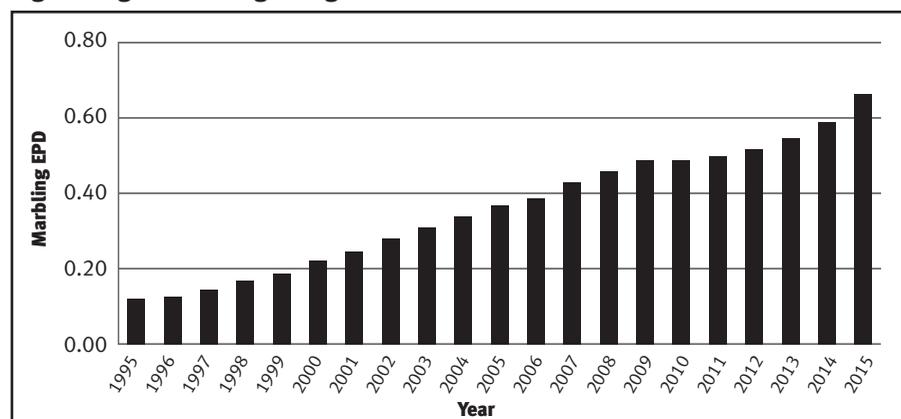
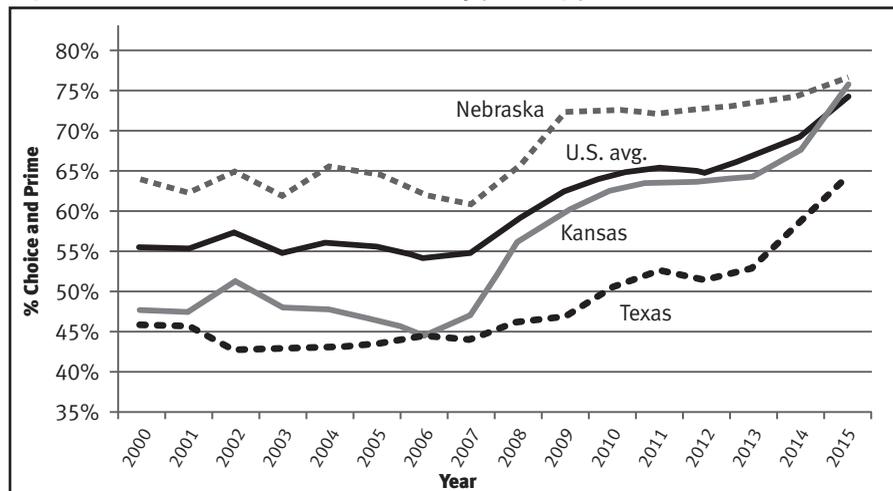


Fig. 4: Percent Choice and Prime trend by packing plant location



side deserve much of the credit for marbling improvement during the past 20 years. As packer grids advanced premiums for Choice, CAB brand and Prime carcasses, producers incorporated marbling selection in their breeding plans. Marbling is estimated at a moderate to high 0.45 heritability, so selection for it has rapidly advanced marbling levels. The American Angus Association's historical trend for marbling expected progeny difference (EPD) shows it improved by 0.55 marbling units in Angus cattle from 1995 to 2015 (see Fig. 3).

the most popular beef breeds have moved in a positive direction during that period.

On the female side, the severe Texas and Southwestern drought of 2011-2012 triggered massive culling, an estimated 1.2 million cows from Texas alone. In theory, the least desirable were culled

and eventually replaced with genetically superior heifers. Recent grading history supports the theory (see Fig. 4, page 32). Texas packing shows the lowest overall quality grading. Texas shows the greatest improvement from 2012 to 2015 in a three-state comparison with a 12% increase in share of Choice and Prime

carcasses, followed by Kansas with a 10% increase and Nebraska with just a 3% improvement.



Editor's Note: Paul Dykstra is a beef cattle specialist for Certified Angus Beef LLC.

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The breed's impact on the U.S. beef cattle population continues to grow, as noted in bull turnout data collected by *Western Livestock Journal*, which showed Angus bulls represented 78.5% of the bull battery in 2013, up from 61.4% in 2000. Further analysis of that data in 2015 summarized bulls sold at auction in 13 western states, where Angus made up 70% of bulls sold, followed by Red Angus at 11.1% and Hereford at 8%.

Similar but nationwide studies in 2013 showed 67% to 69% using at least some Angus bulls, and one showed 40% using only Angus bulls.

Table 1: Marbling EPD change during 10-year period

Breed	Mean marbling EPD		
	2005	2015	Change
Angus	+0.37	+0.67	+0.30
Red Angus	+0.35	+0.50	+0.15
Hereford	+0.02	+0.09	+0.06
Simmental	+0.10	+0.28	+0.18

Bulls within any breed differ in marbling potential, but the overriding Angus influence on the nation's cow herd has exerted a positive influence on marbling. Updated 2016 data from the U.S. Meat Animal Research Center show Angus-sired calves born in 2014 had the highest mean marbling score compared to any of the other 17 sire breeds studied. Heavy use of Angus bulls in the U.S. cow herd, along with their marbling advantage appeared to have a positive impact on marbling rates in fed cattle through 2016.

Note that marbling progress in the past decade (see Table 1) has been made not only in the Angus breed but also among other popular beef breeds. Average EPDs for all four of