Your Link to CERTIFIED ANGUS BEEF® BRAND

by **STEVE SUTHER,** *director, Industry Information, Certified Angus Beef LLC*

Marbling still key to feeding profits

Assessing the cost of beef quality, revisited.

A few years can seem like the distant past in times of rapid change. You still try to manage cattle and resources based on market incentives, but that's no simple task when the signals change faster than you can adjust genetics or your production system.

Sometimes you just have to step back and check the flow. Let's take a look at where money comes from, where it goes and how to keep some of it there at the ranch and feedlot. The Iowa Beef Center at Iowa State University (ISU) broke new ground in 2002 when it published, "Assessing the Cost of Beef Quality."

What does it cost to produce quality? It pays, according to that study by ISU student research assistant Cody Forristall and a faculty team headed by agricultural economist John Lawrence.

In feedlot profitability, marbling turned out to be a key driver, even more important than carcass weight when the Choice-Select spread was at the 1996-1999 average of $8 per hundredweight (cwt.) or higher. Moreover, that study concluded, "The current trend to rewarding higher-quality-grading cattle will have the added benefit of reduced cow cost."

Much has changed in the last decade, so what about the cost/value relationship? To find out, Certified Angus Beef LLC (CAB) sponsored a "Revisit" 2009 white paper by Lawrence through ISU student Maro Ibarburu-Blanc with Tri-County Steer Carcass Futurity (TCSCF) manager Darrell Busby.

Both papers refer to the years before the late 1990s as "the commodity era of beef production," when market signals focused on pounds. The 2009 paper notes several changes since 1999: "Value-based marketing is commonplace, the national beef cow herd has shifted toward more Angus influence, and carcass weights have increased. Most notably, however, cattle and grain prices have increased."

Iowa fed cattle and corn prices for 1996-1999 averaged $64.13 per cwt. and $2.49 per bushel (bu.), respectively, compared to $88.87 and $3.04 for 2005-2008. Demand from biofuel plants could keep corn prices higher than that range going forward. The ISU team looked at the relative importance of selected cattle performance and carcass characteristics on feedlot profitability, given the new price levels.

The goal of this analysis was to explain as much of the variation in profitability across cattle as possible.

It did not revisit the linkage between higher marbling and lower cow costs.

The 2002 paper outlined the rise of grid marketing and ranked traits affecting profit. Building on that with more TCSCF data on individual gain, efficiency and carcass measurements, the "Revisit" shows quality is at least as important with higher costs. In fact, no other driver of feedlot profitability was more important than marbling at Choice-Select spreads of $6 per cwt. or more.

Data

Since the early 1980s, TCSCF has specialized in retained-ownership for producers in 21 states, collecting data on a wide array of traits at arrival, throughout feeding and at harvest. From 2004 to 2008, the database exceeded 35,000 head. Limiting that to fourth-quarter placements in the 6- to 18-month age bracket leaves 64.7%, or nearly 15,000 head.

These were more uniform than the average cattle seen in the 2005 National Beef Quality Audit, mainly because TCSCF feedlots follow similar management and

Table 1: Correlation matrix of selected caracass and management variables for Tri-County Steer Carcass Futurity steers and heifers placed in the fourth quarter, n = 13,639

Both sexes	HCW	FC	REA	MS	FG	ADG	PW	HT
Hot carcass wt.	1							
Fat cover	0.04	1						
Ribeye area	0.53	-0.29	1					
Marbling score	0.04	0.27	-0.15	1				
Feed to gain	-0.08	0.27	-0.31	0.02	1			
Average daily gain	0.57	0.10	0.28	0.16	-0.54	1		
Placement wt.	0.55	0.03	0.26	-0.10	0.40	0.01	1	
Health treatments	-0.10	-0.09	0.00	-0.11	-0.06	-0.14	-0.07	1

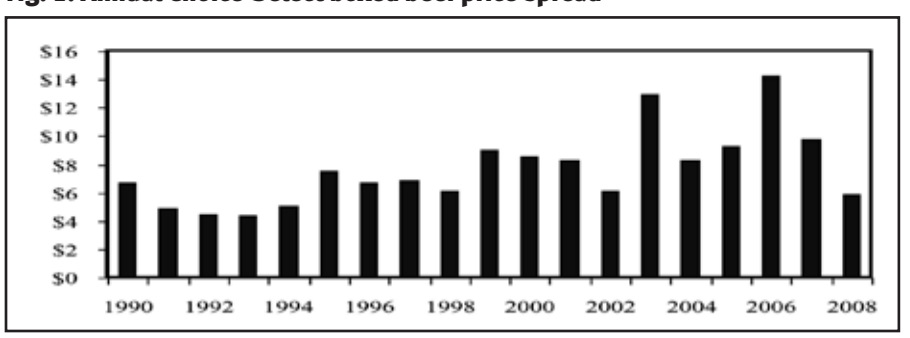
Table 2: Base marketing grid used for calculating final carcass value

Base Carcass Price	$140.12		
Quality Grade	Adjustment	Carcass wt.	Adjustment
Prime	$15.00	Under 500 lb.	-$30.00
CAB (Ch+ and Ch0)	$5.00	500-549 lb.	-$20.00
NonBlack (Ch+ and Ch0)	$5.00	951-999 lb.	-$10.00
Select ($ off of Choice)	-$8.00	1,000 lb. and up	-$20.00
Standard ($ off of Choice)	-$25.00		
Off Grades ($ off of Choice)	-$35.00		
	Yield Grade Adjustment		
Yield Grade 1, +$5.00	YG 2, +$3.50	YG 4, -$20.00	YG 5, -$25.00

Table 3: Economic value of a one-unit change in the independent variable on the net returns for steers and heifers placed in the fourth quarter

Variable	One Unit	Steers	Heifers
Intercept		-649.04	-496.39
Hot carcass wt.	10 lb.	3.50	4.60
Fat cover	1/10 in.	-5.37	-10.65
Ribeye area	1 sq. in.	12.10	12.12
Marbling score	1/3 grade	17.08	13.77
Feed to gain	1/10 lb.	-2.61	-2.87
Average daily gain	1/10 lb.	3.58	2.15
Placement wt.	10 lb.	-3.40	-2.90
Health treatments	$1	-1.29	-1.24

Fig. 1: Annual Choice-Select boxed beef price spread



CAB STAFF CONTACTS

206 Riffel Rd., Wooster, OH 44691-8588; phone: 330-345-2333; fax: 330-345-0808;
www.cabpartners.com

John Stika, president
Brent Eichar, senior vice president
Tracey Erickson, vice president, marketing
Mark Polzer, vice president, business development
Larry Corah, vice president, supply development

SUPPLY DEVELOPMENT DIVISION
Kansas staff:
CAB Program Satellite Office
1107 Hylton Heights Rd.
Manhattan, KS 66502
phone: 785-539-0123; fax: 785-539-2883

Larry Corah, vice president
Gary Fike, beef cattle specialist
Wendy Nichols, office and data manager
Lance Zimmerman, supply development marketing manager

Nebraska staff:
Paul Dykstra, beef cattle specialist
782 5th St., PO Box 856,
Chappell, NE 69129
308-874-2203
Miranda Reiman, industry information specialist
75845 Rd. 417, Cozad, NE 69130; 308-784-2294

Ohio staff:
Mark McCully, assistant vice president; supply development director
Marilyn Conley, administrative assistant
Laura Nelson, industry information specialist

INDUSTRY INFORMATION DIVISION
16360 Victory Rd., Onaga, KS 66521
phone: 785-889-4162
Steve Suther, director

To order CAB merchandise, visit ***www.angussalebarn.com.***

marketing protocols, with sorting to a finished end point. Most were spring-born, 85% had at least one Angus grandparent, 89% were placed on feed before 12 months of age, and 75.4% were steers.

The paper analyzed all the correlations between traits (see Table 1). Hot carcass weight is highly and positively correlated with ribeye area (REA), average daily gain (ADG) and placement weight (PW). There is a strong, inverse correlation between ADG and feed efficiency, as estimated from the Cornell model. The table shows several moderate correlations, such as those between fat cover and both marbling and feed to gain (FG), and a similar negative relationship with REA. The inverse correlation of REA with FG shows potential for simultaneous progress.

Methods

Input and output prices were standardized over time to find the profit differences due to performance, efficiency and carcass traits.

Cattle prices were based on U.S. Department of Agriculture (USDA) published reports. The fed-cattle base was the Nebraska weighted average of Choice-Select 35%-65% from August 2004 to July 2009, adjusted by a monthly index to estimate the grid base price. That Nebraska average from 1992 through 2008 was used in estimating the monthly seasonal index. Feeder-cattle prices and trends were derived from Missouri, Nebraska and Kansas auctions, with the seasonality index drawn from the 10-year span of September 1999 to August 2009, the last five years being the base price for feeders.

Total revenue was calculated for each animal from its carcass data applied to the base price and a representative grid (see Table 2), whose premiums and discounts were later adjusted to determine the sensitivity of results to grid parameters.

The goal of this analysis was to explain as much of the variation in profitability across cattle as possible. That's why results were evaluated over a range of cattle prices, discounts, premiums and feed prices. The regression analysis provides "beta coefficients" that reflect the change in net return for a one-unit change in the independent variable, and these are standardized to allow for the likelihood of variation.

Results

Models were estimated that explain 78% of the variation in steer net return (NR) and 73% of that for heifers. The larger the absolute value in standardized beta, the more important. In these data, at the top of the list explaining NR in the baseline scenario is marbling score (MS), accounting for 42% of NR variation in both steers and heifers.

Regression beta coefficients indicate the dollar impact on NR for a one-unit change in an independent variable, but that's hard to envision or interpret. Table 3 scales those into more common units. For example, multiplying the MS beta by 33.3 points is equivalent to one-third of a quality grade and is associated with increasing NR by $17.08 per head in steers and $13.77 per head in heifers. Similarly, a 10-pound (lb.) increase in carcass weight points to increasing NR by $3.50 per head in steers and $4.60 per head in heifers. The steer NR decreased $1.29 per head for every dollar spent in health treatments, so there is an effect beyond the treatment cost itself.

Sensitivity analysis

A sensitivity analysis looked at how steer NR changes when the Choice-Select spread, base carcass price and feed prices change. The spread baseline of $8 was examined at $4, $12 and $16. Feed prices were adjusted up and down by 20% and the base carcass price was evaluated up or down $10 per cwt.

Not surprisingly, the economic importance of marbling is directly related to the Choice-Select spread (Fig. 1). Even at $4 per cwt., it is the second-most important variable in NR, just slightly

(Continued on page 52)

CAB Link *(from page 51)*

lower than placement weight. However, MS importance increases with the spread. And as marbling becomes more important, the other variables become relatively less so.

One-third of a quality grade (33.3 degrees of marbling) is worth $12.65 per head at a $4 Choice-Select spread and $31.30 per head at a $16 spread. When the spread is about $6 per cwt., MS and PW tie for the lead trait, each explaining about 34% of the variability in steer NR.

Marbling score remains the most important variable over the range of feed and carcass prices considered. Feed to gain, PW and HCW are the most sensitive variables to changes in feed costs, the latter two being more important with lower feed cost. Hot carcass weight is the only variable to show much change due to a change in base price. It is more important at higher prices and less important at lower prices.

Summary

Any way you look at it, this analysis of nearly 15,000 head of fall-placed calves found the same basic results as the original study seven years earlier. That's in spite of 22% higher corn prices and 38% higher cattle prices.

The relative importance of each variable in the model on net return in the feedlot was less pronounced in this analysis than in the 2002 study, perhaps because we had the addition of placement weights, health data and an overall 13-fold increase in the number of data points. That could moderate the impact of any one variable.

Hot carcass weight is the only variable to show much change due to a change in base price.

In both studies, marbling was identified as having the largest relative impact on net returns for feedlot cattle when the Choice-Select spread is $8 per cwt. or higher. The latest study also identifies $6 per cwt. as the Choice-Select spread point where the relative importance of marbling score is equal to other factors. Otherwise, nothing changes in the order: carcass weight and feed efficiency are still next after marbling, followed by ribeye area in fourth place.

During the last 15 years, the Choice-Select spread has averaged lower than $6 per cwt. only once, and that was last year. Mark McCully, CAB assistant vice president for supply, concludes, "Marbling is still the most important performance and carcass trait, even as prices shift, so we must learn how to keep feeding cattle to make the most of their marbling potential."

In every phase of the beef industry, from ranch to consumer, "it is increasingly important to understand cost/value relationships," he says. "In the recent economic turmoil, consumer sales of the *Certified Angus Beef*® brand increased because of that understanding. It's even more important on the ranch, to know what makes more money in the end."

You can find the complete white paper, "Assessing the Cost of Beef Quality, Revisited," at *www.cabpartners.com/news/research/index.php,* and view a video with John Lawrence discussing the paper at *www.youtube.com/watch?v=vr0LXX_5RJk*.