



BEEF CATTLE RESEARCH UPDATE

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Effects of Quality Defects on Market Beef Cow Selling Prices

Cull cow receipts generally account for 15 to 30% of cash receipts from the cow-calf enterprise.¹ However, many producers simply choose to dispose of cull cows as quickly and easily as possible, giving little attention to this source of income and ways of enhancing it.^{1,2} A 2007-08 survey by the USDA National Animal Health Monitoring System reported that the two most common reasons that beef operations sold cull cows were age or bad teeth and pregnancy status (55.7 and 41.8% of operations, respectively).³ This survey also showed that the percentage of operations that sold at least one cull cow in 2007 because of pregnancy status ranged from 25% of operations with 1 to 49 beef cows to 83.6% of operations with 200 or more beef cows. Furthermore, this survey reported that the percentage of operations that sold at least one cull cow in 2007 for physical unsoundness, bad eyes, udder problems, or producing a poor calf increased as herd size increased.

A recently published experiment determined if Beef Quality Assurance (BQA) related factors affect market beef cow selling prices.⁴ In this study, beef sale data were collected at 6 major livestock auction markets with regular weekly sales (5 locations in Idaho, and 1 in Utah) during the spring and fall of 2008.⁵ Data was collected at a total of 79 beef sales (8,213, 9,299 beef cows). The mean sale price for beef cows in this survey was \$45.15/cwt. The relative effects of some of the more notable BQA-related characteristics on selling price among market beef cows are shown in Table 1.

Table 1. Relative effects of BQA-related characteristics on the selling price of market beef cows. (For each characteristic, the “par” or “base” cow is listed in the comment section.)

Characteristic	\$/cwt	P-value	Comment
BCS 1	-13.01	<0.0001	Base
BCS 2	-6.78	<0.0001	
BCS 3	-5.09	<0.0001	
BCS 4	-2.12	<0.0001	
BCS 5	-----	-----	
BCS 6	1.65	<0.0001	
BCS 7	1.65	<0.0001	
BCS 8	1.97	0.02	
BCS 9	4.04	0.07	
BW <800 lb	-7.85	<0.0001	Base
BW 800 to 999 lb	-1.76	<0.0001	
BW 1000 to 1199 lb	-1.13	<0.0001	
BW 1200 to 1399 lb	-----	-----	
BW 1400 to 1599 lb	0.55	0.05	
BW 1600 to 1799 lb	1.75	<0.001	
BW ≥ 1800 lb	2.31	<0.01	
LS 1	-----	-----	Base
LS 2	-1.32	<0.0001	
LS 3	-2.23	<0.0001	
LS 4	-8.55	<0.0001	
LS 5	-14.88	<0.0001	
No Ocular Neoplasia (Cancer Eye)	-----	-----	Base
Ocular Neoplasia Score 1 to 2 (precancerous)	-3.91	0.05	
Ocular Neoplasia Score 3 to 5 (cancerous)	-14.95	<0.0001	

Adapted from Ahola et al., 2011.

Compared with a base body condition score (BCS) 5 beef cow, BCS 1 to 4 cows were discounted, whereas BCS 6 to 9 cows received premiums. These data show that discounts for cows in poor body condition (BCS < 5) were considerably greater than the premiums received for cows with BCS > 5. Premiums and discounts based on cow body weight (BW) were similar to BCS premiums and discounts. Light cows (less than 1200 lb) were discounted \$7.85/cwt for weights less than 800 lb, \$1.76/cwt for weights of 800 to 999 lb, and \$1.13/cwt for weights of 1000 to 1199 lb. Heavier cows, in comparison with cows weighting 1200 to 1399 lb, received a premium if they weighed 1400 to 1599 lb (\$0.55/cwt), 1600 to 1799 lb (\$1.75/cwt), or more than 1800 lb (\$2.31/cwt).

These researchers also reported that cows with evidence of lameness were discounted. At the time the cows were being offered for sale in the auction ring, locomotion scores of 1 to 5 (LS 1 = sound, LS 5 = extremely lame) were collected on every lot. The discounts varied on the severity of the lameness. Beef cows with less severe lameness (LS 2 = hunched back only when walking; LS 3 = hunched back when standing and walking) were discounted \$1.32 and \$2.23/cwt, respectively. Cows that had a hunched back while standing and walking and favoring one limb (LS 4) were discounted \$8.55/cwt. Cows that refused to bear weight on a limb and had great difficulty walking received a discount of \$14.88/cwt. These researchers noted that cows receiving a lameness score of 4 or 5 should not be marketed through auctions markets due to a greatly increased likelihood of becoming nonambulatory (downers).

It was also reported that beef cows with of ocular neoplasia (cancer eye) in the precancerous stage received a discount of \$3.91/cwt and were discounted at \$14.95/cwt in the cancerous stage. A 2002 survey of livestock auction markets in Arkansas observed that market beef cows with "bad eyes" (based on the presence of a spot on the eye) were discounted \$14.55/cwt compared with healthy cows.⁶ These data suggest that cows should be shipped immediately after the first stages of cancer eye are observed to minimize discounts.

In summary, this survey illustrates that body condition and body weight are two of the most important factors determining potential premiums that cattle producers can receive for their market cows when selling through a livestock auction. These results suggest that improving body condition and weight positively affects sale price. Obviously, the economics of adding value to cull cows by feeding them will depend on feed prices and the individual producer's situation. These data also clearly illustrate the importance of following BQA recommendations, including the need to cull animals in a timely manner as one of the best measures to maintain their salvage value. Cows with minor quality defects should be sold before the defect advances and the discount increases.

Comparing the Environmental Impact of the US Beef Industry in 1977 to 2007

Historical livestock production is commonly perceived to be inherently more environmentally sustainable than modern agricultural practices. A recent Washington state University study modeled the environmental impact of the 1977 United States beef industry (23.4 billion lb beef produced from 38.7 million head slaughtered) with that of 2007 (26.2 billion lb beef produced from 33.7 million head).⁷ This data showed that the total animal population required to produce one billion lb of beef in 2007 was reduced by 27% compared with 1977. This decrease in the beef cattle population resulted in reductions in total feed energy, feedstuffs and land use of 10%, 17% and 27% respectively. Water use per billion lb beef was reduced by 15% between 1977 and 2007. This study suggested that methane and nitrous oxide emissions per billion lb produced in 2007 were reduced by 17% and 13%, respectively. As a result, the total carbon footprint (expressed as CO₂-equivalents per billion lb beef) was reduced by 14% in 2007 compared with 1977. This researcher concluded that this analysis clearly demonstrated that improvements in United States beef industry productivity caused by advances in slaughter weight, growth rate, nutrition and management have considerably reduced the environmental impact of modern beef production, thus improving the sustainability of livestock production.

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 - ³ USDA-APHIS. 2010. Beef 2007-08, part iv: Reference of beef cow-calf management practices in the united states, 2007-08. USDA-APHIS-VS-CEAH. Available:
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 - ⁵ Ahola, J. K., H. A. Foster, D. L. VanOverbeke, K. S. Jensen, R. L. Wilson, J. B. Glaze, Jr., T. E. Fife, C. W. Gray, S. A. Nash, R. R. Panting, and N. R. Rimbey. 2011. Survey of quality defects in market beef and dairy cows and bulls sold through livestock auction markets in the Western United States: I. Incidence rates. *J. Anim. Sci.* 89:1474-1483.
 - ⁶ Troxel, T. R., M. S. Gadberry, S. Cline, J. Foley, G. Ford, and D. Urell. 2002. Factors affecting the selling price of replacement and market cows sold at Arkansas livestock auctions. *Prof. Anim. Sci.* 18:380-386.
 - ⁷ Capper, J. L. 2010. Comparing the environmental impact of the US beef industry in 1977 to 2007. *J. Anim. Sci.* 88 (E-Suppl. 2):826 (Abstr.).

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