

Factors Influencing Weaned Calf and Yearling Prices

by

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Despite the upward trend in cattle prices over the past decade, the markets for weaned calves and yearlings continue to be volatile as they seek to reflect beef consumers' ever-changing tastes as well as the changing preferences of feedlots and packing plants. Cattle buyers try to identify the characteristics that consumers and beef processors prefer and then find cattle with those characteristics. The prices offered by buyers to cattle producers indicate which attributes are more or less desired at the time of the sale. However, in recent years there have been fairly significant changes in consumer and processor preferences and, as a result, there have also been significant changes in which product attributes are rewarded by receiving price premiums in the markets for calves and yearlings. This indicates that the cattle production practices used by ranchers may need to be modified so as to conform to the markets' demands that will lead to the best price possible.

Another highly important change that has affected the prices received by cattle producers in California over the past decade is related to the structure of the cattle industry in the United States. The industry continues to be more concentrated with most feedlot, processing, and packaging facilities located in the Midwest. This puts cattle producers in California at a

competitive disadvantage, compared to their Midwestern competitors, because a study conducted in 2004-05 by the University of California showed that feeder cattle prices were discounted by increasing amounts in markets located farther west, relative to Midwestern prices. This means ranchers in California and other western states are essentially paying for shipping calves to processing facilities in the Midwest. These results are alarming for cattle ranchers in California because, with the cost of transportation increasing rapidly, there is reason to expect cattle price discounts to increase over time in Western markets.

We conducted research during 2008 as a follow-up and expansion of the earlier UC study and found that western cattle markets are indeed dynamic, as evidenced by several changes in the management practices being applied by ranchers and by changes in the pricing observed for steers in both calf and yearling cattle markets. Our study focused on steer price differences in both calf and yearling markets across locations and was able to estimate both average transport-based price discounts and individual value-added program premiums received by ranchers. The new analysis shows that the pricing of value-adding factors, such as preconditioning, is changing as markets adapt to new supply and demand conditions and that transportation-based discounts across market regions are increasing over time. The new research has significant implications for cattle ranchers in California and other Western states.

The New Study

Western Video Market provided us with anonymous information on steers from 4,116 lots of calves and 5,147 lots of yearlings sold in video auctions during the period 1997-2007. All calf lots had a flesh score of medium, a frame score of medium or medium-large, and average weights in the 500-625 pound range. This weight range was used to focus on the price effects of management of calves at weaning. Yearling lots averaged in the 750-925 pound range. In total,

approximately 571,000 calves and 874,000 yearlings were included in our data. Other information available for each of the lots included characteristics of the animals and details about each sales contract.

We used sales information from video auctions because that type of sale operates much like a traditional auction, but has a much larger pool of potential buyers from across the country. Thus, cattle sale prices observed in video auctions are often more indicative of “national” prices than are local cash sale prices. The cattle in our study were sold from ranches across most western states.

Value-Added Programs’ Price Effects

We evaluated the price effects of several value-adding programs, as well as the location, by using statistical analyses. The value-adding factors are listed in the top half of Table 1. Each of these value-adding programs was used by different numbers of ranchers over time and in different locations. Over the eleven-year period premium amounts for calves were largest from weaning over 30 days, followed in amounts by natural beef, Certified Angus Beef, and preconditioning. For yearlings, the largest price premiums came from natural beef, preconditioning, and Certified Angus Beef, respectively. Overall, some programs became much more popular during the 1997-2007 period, whereas other programs (such as “domestic born”) grew and then faded.

The results for the value-adding factors listed in Table 1 indicate how much the average price received was affected by the presence of the attribute. The first column in the table lists the factors evaluated. The “price effect” columns show the effect on the average price received by ranchers for calves or yearlings when the factor is present. The “significance” columns show

whether or not the “price effect” is statistically significant, meaning we have confidence that the marketing or management factor is responsible for the price difference. Overall, nearly all of the factors had a significant effect on calf and yearling prices. For example, our analysis shows that calves that had not been weaned at the time of the sale received an average price 3.59 cents per pound lower than the price for calves weaned 30 days or longer. For yearlings, we found a 0.72 cent per pound discount for cattle fed from hay lots only compared to cattle fed from pasture only.

Of particular interest are the results for three value-adding programs: preconditioning, implants, and natural beef. Preconditioning and natural beef each got a larger price premium over our study period than was found by the earlier UC study for a shorter period, while implanting programs again had no significant effect on prices received by ranchers over the entire 1997-2007 period (Table 1).

To see how the cattle markets evolved over time with regard to value-adding programs, we estimated separate models for each of the 11 years for calves and yearlings. The results show that some factors had few significant annual results even though they had a strongly significant result over the entire period. The “Age and Source Verified” program (ASV) is an example of this problem. Calf results for ASV in Table 1 show it received a statistically significant price premium averaging \$5.31/cwt overall, but we found that ASV had a significant result in only one of the three years the program has been available. For yearlings the problem is similar with ASV having only two of four annual results that are statistically significant. In 2005 the percentage of sale lots that were ASV was 62.5 for calves and 36 for yearlings, but the share fell to less than 15 percent for both markets in 2007. Thus, the small number of ASV observations per year made it difficult to measure the price effects in separate years, however it appears that producers did

receive a premium, on average, from the program.

The explanation for the difference between results of earlier studies and our results is readily apparent. The cattle industry has responded to the market. Preconditioning and natural beef have each grown in terms of their shares of cattle sold during our study period, while implants have declined in popularity. The catalyst behind this change is the dynamics of a competitive market: sellers respond to buyers' product preferences. Buyers were expressing a preference for preconditioned and "natural" cattle during the 1990s, but few sellers were aware of this change in demand at first, thus few ranchers were supplying animals to the market with those characteristics. Yet, over time cattle ranchers learned of the new market demands and began supplying those types of product hoping to receive a price premium for their efforts.

Regional Price Discounts

Our analysis of price differences across locations was simplified by grouping the sales data into several market regions based on the pooling and flow of cattle observed in those locations over recent years. The regions are shown in Figure 1. The out-of-state regions (regions 3, 4, 55, and 6) are large, often covering entire states, whereas California was divided into three regions (regions 10, 15, and most of 25) to enable detailed analysis of local markets. Region 20 covers parts of three states, including western Oregon, the extreme northwest corner of Nevada, and the extreme northeast corner of California. Also, a unique region (region 5) was defined to include the coastal areas of California, Oregon, and Washington. This "fog" region was evaluated separately because comments from ranchers in recent years indicated that the coastal area may be receiving price discounts even larger than those observed in neighboring areas.

The results of our study show that western markets consistently received a price discount

over the data period. Table 1 shows the results of our general analysis of the sales data over the entire 1997-2007 period for both calves and yearlings. Simply stated, what these results show is the average amount of the price discount or premium received by cattle producers in each market region after accounting for the effects on prices from the other factors listed over the entire 1997-2007 period.

As an example, consider the calf price result for market region 10, which covers northwestern California (except for the coastal area). The price effect shows an average discount of \$8.77/cwt relative to the average price received for sales in region 6, which was used as the base because it includes the active cattle market in Nebraska.

When viewing the map in Figure 1, it is apparent that the regional results for both calves and yearlings are generally consistent with the economic theory that says average price discounts will be larger the farther away the seller is from the Midwest. The regional discounts were smaller for yearlings than for calves, but the same geographic pattern exists.

As noted earlier, there is reason to think the location discounts will increase over time due to increasing transportation costs. Therefore, we evaluated the location price discounts by year to see if they changed over time. The results for calf prices are in Table 2 and yearling results are in Table 3. In both tables, the columns are arranged from left to right in the approximate order of the regions' locations from West to East so as to make it easier to see whether the discounts followed the expected pattern of increasing from East to West. As shown in tables 2 and 3, there were indeed differences in the average discount amounts from one year to the next over the eleven years. Those differences between years imply transportation costs are not the only source of the price discounts observed between the Midwest and other regions. The price differences across years also reflect differences in relative supply and demand in each

location across years. However, the fact that the discount amounts are usually higher for regions farther from the Midwest is support for the conclusion that transportation costs are a major source of the price differences observed. Also, the fact that the discounts increase over time in all regions led us to calculate the trend in that change. We found that transportation cost increases added approximately 30-40 cents per hundredweight per year to the average discount on prices received by Western cattle producers, compared to the prices received by their Midwestern competitors over the eleven-year period.

Finally, the results in tables 2 and 3 show that the coastal “fog” region, 5, did have larger average price discounts than neighboring California regions (10 and 15) quite often. For calves (Table 2), the discount in Region 5 was larger than the discounts in both regions 10 and 15 during nine of the eleven years. For yearlings (Table 3), the foggy coastal region had larger price discounts than northern California (Region 10) during eight of the eleven years. However, compared to southern California (Region 15) the coast had larger average discounts in only five of the eleven years.

Implications of the Results

In the future, the existence of location discounts and their amount will continue to depend upon the cattle market structure. As long as most feedlots and meat processing facilities are located in the Midwest, most calves and yearlings raised in California will be sold at a price discount and shipped out of the state.

This leaves ranchers in California and other western states with few ways to raise their average price received other than those coming from value-adding innovations, such as weaning calves before they are sold, or by using “natural” production methods for calves and yearlings. These factors can result in higher average market prices. However, whether the costs associated

with those factors are lower than the price benefits is a question each rancher will have to determine individually. Thus, the western cattle industry's future may involve discovering new market trends and quickly changing cattle management practices to produce a profitable niche product.

Figure 1. Market Regions

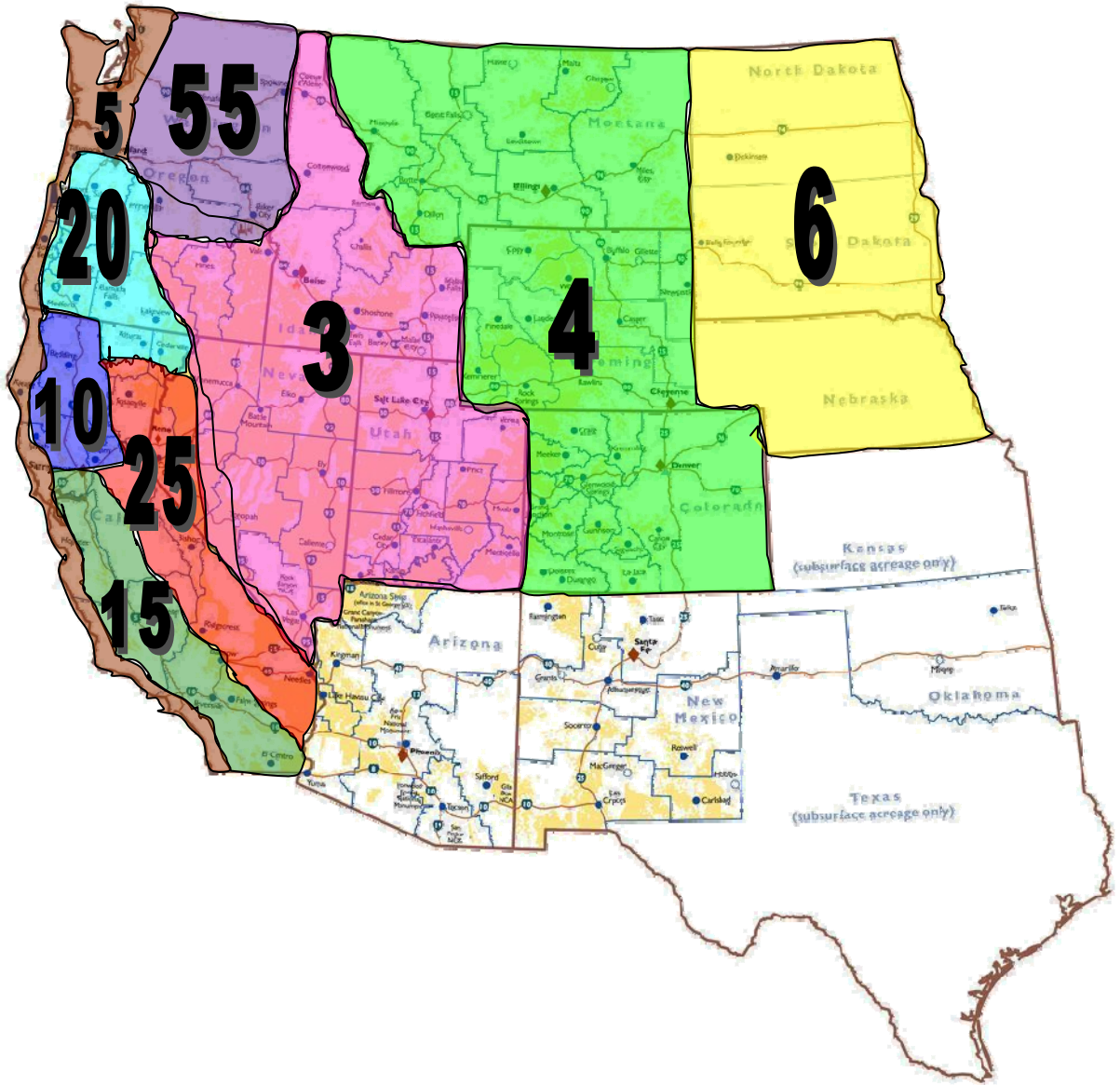


Table 1. Average Effects of Factors on Cattle Prices, 1997-2007

<i>Factor</i>	<i>Calf Prices</i>		<i>Yearling Prices</i>	
	<i>Price Effect</i>	<i>Significance</i>	<i>Price Effect</i>	<i>Significance</i>
	<i>\$/cwt</i>		<i>\$/cwt</i>	
Preconditioned	1.37	*	1.03	*
Age Source Verified	5.31	*	1.96	*
Bunk broke	-1.83	*	-0.90	*
Certified Angus Beef	1.38	*	0.67	*
Domestic Born	3.23	*	3.16	
Western Ranchers' Beef	0.46		2.92	*
Implants	-0.50		-0.22	
Natural beef	2.25	*	3.78	*
Calf weaning 0 / Yearling feed 1	-3.59	*	-0.72	*
Calf weaning 1 / Yearling feed 2	1.29	*	-0.78	
Location 5 (coasts of Calif., Ore. and Wash.)	-10.54	*	-6.61	*
Location 55 (Wash., NE Ore.)	-11.63	*	-6.72	*
Location10 (NW Calif.)	-8.77	*	-7.28	*
Location 15 (S Calif.)	-10.71	*	-8.29	*
Location 20 (W Ore., NW Nev., NE Calif.)	-10.12	*	-7.45	*
Location 25 (E Calif., W Nev.)	-10.86	*	-7.65	*
Location 3 (SE Ore., Idaho, Utah, E Nev.)	-9.89	*	-7.12	*
Location 4 (Mont., Wyo., Colo.)	-3.61	*	-1.89	*
Trend over time (year)	3.93	*	3.80	*

The factor is statistically significant (different than zero) when indicated by *. A value with no asterisk is essentially zero, meaning there is no price premium or discount.

Definitions: "Bunk broke" means the cattle are accustomed to eating out of a feed bunk. "Western Ranchers Beef" is a rancher marketing cooperative that has set a standard for product sold by members. "Natural" beef is certified in an affidavit from the seller.

The "weaning" variables are used only in the calf model and the "feed" variables are used only in the yearling model. For weaning, the base of comparison is calves weaned 30 days or more, "weaning 0" indicates calves not weaned, and "weaning 1" indicates calves weaned less than 30 days. For feeding, the base of comparison is cattle fed from pasture only, "feed 1" indicates yearlings fed from hay lots only, and "feed 2" indicates yearlings fed on both pasture and hay lots.

Table 2. Regional Price Discounts by Year, Weaned Calves (\$/cwt)

	<i>Region 5</i>	<i>Region 55</i>	<i>Region 10</i>	<i>Region 15</i>	<i>Region 20</i>	<i>Region 25</i>	<i>Region 3</i>	<i>Region 4</i>
1997 n = 171	-5.49 *	-3.55 *	-4.86 *	-5.06 *	-4.55 *	-4.19 *	-3.43 *	0.14
1998 n = 154	-6.93 *	-1.35	-3.88 *	2.10	-2.44 *	4.01 *	-3.16 *	-0.49
1999 n = 234	-5.94 *	-2.35 *	-6.79 *	-6.94 *	-4.68 *	-4.56 *	-3.34 *	-1.69 *
2000 n = 347	-9.56 *	-5.48 *	-5.45 *	-4.92 *	-6.43 *	-7.79 *	-6.04 *	-0.53
2001 n = 367	-8.30 *	-7.76 *	-3.84 *	-7.73 *	-6.99 *	-8.99 *	-6.03 *	-0.84
2002 n = 331	-7.18 *	-3.67 *	-2.31 *	-5.62 *	-2.07 *	-4.06 *	-2.80 *	-1.44 *
2003 n = 450	-10.65 *	-8.50 *	-7.38 *	-7.45 *	-8.38 *	-10.13 *	-7.80 *	-2.88 *
2004 n = 529	-13.08 *	-6.72 *	-8.32 *	-11.09 *	-8.50 *	-13.05 *	-8.49 *	-2.60 *
2005 n = 542	-15.13 *	-10.37 *	-6.08 *	-1.71	-9.39 *	-12.51 *	-9.29 *	-2.61 *
2006 n = 451	-19.03 *	-13.65 *	-12.97 *	-16.76 *	-13.84 *	-14.60 *	-13.73 *	-4.99 *
2007 n = 540	-13.22 *	-16.70 *	-15.07 *	-12.19 *	-15.72 *	-17.57 *	-14.51 *	-4.26 *

Note: results show the average differences between the region indicated and Region 6, which was used as the base. Negative numbers are discounts, positive numbers are premiums. Thus, Region 6 had the highest average prices. “n” is the number of lots sold during the year. The values shown are statistically significant (different than zero) only when indicated by *.

Table 3. Regional Price Discounts by Year, Yearlings (\$/cwt)

	<i>Region 5</i>	<i>Region 55</i>	<i>Region 10</i>	<i>Region 15</i>	<i>Region 20</i>	<i>Region 25</i>	<i>Region 3</i>	<i>Region 4</i>
1997 n = 234	-5.53 *	-2.41 *	-5.28 *	-5.05 *	-3.84 *	-5.24 *	-3.56 *	-1.01 *
1998 n = 345	-6.53 *	-4.62 *	-4.32 *	-3.26 *	-5.03 *	-5.62 *	-4.66 *	-0.55
1999 n = 373	-4.58 *	-2.27 *	-5.15 *	-6.11 *	-3.27 *	-4.57 *	-3.06 *	-1.12 *
2000 n = 424	-3.95 *	-2.31 *	-4.16 *	-4.85 *	-3.40 *	-3.61 *	-2.75 *	-1.48 *
2001 n = 455	-9.38 *	-5.79 *	-7.97 *	-9.31 *	-7.37 *	-7.26 *	-6.24 *	-2.02 *
2002 n = 457	-5.73 *	-3.11 *	-4.03 *	-6.41 *	-4.63 *	-4.72 *	-3.89 *	-0.51
2003 n = 506	-7.43 *	-5.39 *	-6.84 *	-8.29 *	-6.85 *	-7.69 *	-5.83 *	-1.11 *
2004 n = 554	-9.57 *	-9.78 *	-10.20 *	-13.51 *	-10.24 *	-9.96 *	-10.31 *	-3.14 *
2005 n = 641	-8.65 *	-7.45 *	-7.18 *	-6.86 *	-8.75 *	-8.43 *	-7.51 *	-3.44 *
2006 n = 568	-14.09 *	-11.43 *	-12.06 *	-15.84 *	-11.10 *	-11.71 *	-12.03 *	-1.47
2007 n = 590	-14.18 *	-11.81 *	-11.86 *	-11.46 *	-12.27 *	-11.52 *	-9.90 *	-2.71 *

Note: results show the average differences between the region indicated and Region 6, which was used as the base. Negative numbers are discounts, positive numbers are premiums. Thus, Region 6 had the highest average prices. “n” is the number of lots sold during the year. The values shown are statistically significant (different than zero) only when indicated by *.