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# The effect of physical characteristics on the price of stocker and feeder cattle

## **Abstract**

A survey of feeder cattle sales was conducted at seven Kansas cattle auctions during 1986 and 1987. A wide variety of physical characteristics was found to influence feeder cattle prices. The price impact resulting from changes in fill and condition varied seasonally. Although calves showing any signs of health problems received severe price discounts, the presence of other undesirable characteristics also resulted in discounts, but to lesser degrees.

## **Keywords**

Kansas Agricultural Experiment Station contribution; no. 88-363-S; Cattlemen's Day, 1988; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 539; Beef; Stockercattle; Feeder cattle

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**K****The Effect of Physical Characteristics<sup>1</sup>  
on the Price of Stocker and Feeder Cattle****S**Frank Brazle<sup>2</sup>, James Mintert<sup>3</sup>,**U**Ted Schroeder<sup>3</sup>, and Orlen Grunewald<sup>3</sup>

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**Summary**

A survey of feeder cattle sales was conducted at seven Kansas cattle auctions during 1986 and 1987. A wide variety of physical characteristics was found to influence feeder cattle prices. The price impact resulting from changes in fill and condition varied seasonally. Although calves showing any signs of health problems received severe price discounts, the presence of other undesirable characteristics also resulted in discounts, but to lesser degrees.

**Introduction**

Feeder cattle price involves the interaction of many factors. Price differentials among lots of feeder cattle should reflect differences in supply and demand of the cattle in various weight and grade categories. As a result, the relative price premiums and discounts among lots of feeder cattle at a given location should reflect the demand for specific traits of a lot, such as sex, weight, number of head, breed, health, grade, and condition. This study's objective was to examine the effect of a wide variety of physical characteristics on Kansas feeder cattle prices.

**Experimental Procedures**

Data on prices and physical traits of stocker and feeder cattle were collected by a trained staff from seven weekly Kansas cattle auction markets. The date, location, time of sale, price, average weight per head, health, muscling, condition, fill, frame size, sex, breed, presence of horns, and lot uniformity were recorded for each lot sold. Fall data were collected from October 31, 1986 through December 13, 1986; spring data were collected from March 19, 1987 through April 15, 1987. Only data from steers, heifers, and bulls weighing between 300 and 900 lbs. were used. This included 18,534 lots of cattle consisting of 141,677 head. Fifty-eight percent were sold in the fall; 42% were sold in the spring. Fifty-six percent were steers, 3% were bulls, and 41% were heifers. The multiple regression technique used to analyze the data made it possible to independently evaluate each trait's price impact and accounted for the effect on price of interactions between traits.

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## Results and Discussion

The price relationship between weight and sex is shown in Table 21.1. Weight had a nonlinear impact on feeder cattle price, with price declining as weight increased. The lighter the weight, the smaller the price spread between steers and bulls. The price spread for steers vs. heifers as well as for steers vs. bulls narrowed in the spring. These changes from fall to spring may have reflected the classes and weights of cattle desired for spring and summer grazing.

Lot size had a significant impact on price -- buyers preferred large lots. Figure 21.1 shows the effects of lot size on steer prices. The largest premiums were for lots of 55 to 65 head, with a premium in excess of \$5/cwt. relative to single-head lots. Similar results were found for heifers. Sellers can capture a large portion of this premium by marketing cattle in groups of at least 30 head.

The visual indication of health had a profound influence on price. Cattle with mud on their hair received \$1.25 to \$1.80/cwt. discounts (Table 21.2). "Stale" cattle, characterized by watery eyes and runny noses, received price discounts of \$4.65 to \$5.35/cwt. Obviously sick cattle were discounted approximately 25% of the average price of healthy cattle.

The effects of condition (flesh) on price are reported in Table 21.3. During the spring, very thin cattle did not receive significant price discounts. However, during the fall, very thin steers were discounted approximately \$5/cwt, and very thin heifers, over \$6/cwt., relative to cattle in average condition. During the fall, fleshy cattle were not discounted, but they were discounted by approximately \$1.00 to \$1.25/cwt. in the spring. There are clear-cut financial incentives for producers to market feeder cattle in the fall in average to slightly fleshy condition, but in only average condition in the spring.

The effects of fill on price are reported in Table 21.4. Gaunt steers sold for a premium of \$1.25/cwt. over average cattle in the spring, but did not earn a premium in the fall. Full cattle were discounted much more in the spring than during the fall. The seasonal effect of condition and fill may be related to the fact that more health problems normally occur in the fall than during the spring. The data suggest that buyers perceive fleshier cattle with average fill as being better able to withstand winter health problems and are willing to pay a premium for those cattle.

The effects of frame size and breed are reported in Tables 21.5 and 21.6, respectively. Table 21.5 reports the effects of frame size on the price of Hereford cattle only. Hereford steers and heifers falling into the small and the lower half of the medium frame category (Table 21.5) received significant discounts, with small frame heifers discounted \$10/cwt. compared to heifers in the upper half of the medium frame category.

Breed type influenced the prices buyers were willing to offer for feeder cattle, as indicated in Table 21.6. Premiums and discounts are calculated relative to a Hereford of the same sex and frame size. Consequently, price variation attributable to differences in frame size, rather than breed type, have been accounted for and removed.

There was little difference in price for uniform vs. nonuniform cattle. Less than 6% of the cattle sold were identified as nonuniform, indicating that most of the sale barns were sorting the cattle into good, uniform groups. Steers with horns were discounted \$.50/cwt., and mixed horned and nonhorned cattle were discounted \$.25/cwt. This price premium for dehorned cattle may not pay for the setback in performance, if dehorning is delayed until the cattle weigh 500 to 600 lbs. Light-weight calves may be less adversely affected by dehorning and, consequently, there may be some economic advantages to removing horns from light-weight calves.

The degree of muscling also influenced price. As one might expect, lighter muscled cattle were discounted in relation to heavier muscled cattle.

Table 21.7 identifies the price impact attributable to the time during the auction when cattle were sold. The lowest prices were received during the first part of the sale. If cattle were not sold in the first quarter of the sale, time of sale did not appear to have a significant impact on price.

### Conclusion

Kansas cattle producers are encouraged to review the information in this report to become more familiar with the premiums and discounts associated with various feeder cattle characteristics. Although the price changes attributable to the various characteristics will vary somewhat from sale to sale, these survey results should provide a good guideline for both buyers and sellers of feeder cattle.

Table 21.1. Effects of Sex and Weight on Price Discounts of Cattle at Auctions

| Season<br>and<br>Category | Percent<br>of<br>Cattle | Weight Range (lbs) <sup>a</sup> |         |         |         |         |         |
|---------------------------|-------------------------|---------------------------------|---------|---------|---------|---------|---------|
|                           |                         | 300-399                         | 400-499 | 500-599 | 600-699 | 700-799 | 800-899 |
| <b>Spring</b>             |                         |                                 |         |         |         |         |         |
| Steers                    | 58.6                    | Base                            | Base    | Base    | Base    | Base    | Base    |
| Bulls                     | 1.8                     | -1.62*                          | -1.41*  | -1.70*  | -2.48*  | -3.77*  | -5.55*  |
| Heifers                   | 39.6                    | -9.78*                          | -7.85*  | -6.40*  | -5.44*  | -4.97*  | -4.97*  |
| <b>Fall</b>               |                         |                                 |         |         |         |         |         |
| Steers                    | 54.7                    | Base                            | Base    | Base    | Base    | Base    | Base    |
| Bulls                     | 3.2                     | -2.65*                          | -3.60*  | -4.37*  | -4.95*  | -5.37*  | -5.60*  |
| Heifers                   | 42.1                    | -10.24*                         | -8.23*  | -6.71*  | -5.65*  | -5.08*  | -4.98*  |

<sup>a</sup>Discounts are based on the midpoint of each weight category, e.g., 300-399. is calculated for cattle weighing 350 pounds.

\*Indicates significantly different from zero at the .05 level.

Table 21.2. Effects of Health on Price Discounts of Cattle at Auctions

| Health Status    | Percent of Cattle (%) | Steers (\$/cwt.) | Heifers (\$/cwt.) |
|------------------|-----------------------|------------------|-------------------|
| Healthy          | 76.3                  | Base             | Base              |
| Dead Hair or Mud | 22.0                  | -1.22*           | -1.40*            |
| Stale            | 1.1                   | -4.65*           | -5.34*            |
| Sick             | 0.1                   | -19.32*          | -20.53*           |
| Bad Eye          | 0.3                   | -8.35*           | -7.58*            |
| Lame or Lump     | 0.2                   | -14.65*          | -14.28*           |

\*Indicates significantly different from zero at the .05 level.

Table 21.3. Effects of Condition on Price Discounts of Cattle at Auctions

| Condition | Percent of Cattle (%) | Steers           |                | Heifers          |                |
|-----------|-----------------------|------------------|----------------|------------------|----------------|
|           |                       | Spring (\$/cwt.) | Fall (\$/cwt.) | Spring (\$/cwt.) | Fall (\$/cwt.) |
| Very Thin | 0.4                   | +0.61            | -4.97*         | -1.56            | -6.20*         |
| Thin      | 9.1                   | -0.21            | -1.55*         | -0.59*           | -0.88*         |
| Average   | 75.2                  | Base             | Base           | Base             | Base           |
| Fleshy    | 15.2                  | -1.17*           | +0.36*         | -1.09*           | -0.67          |
| Fat       | 0.1                   | -1.28            | +0.02          | 0.74             | -2.11*         |

\*Indicates significantly different from zero at the .05 level.

Table 21.4. Effects of Fill on Price Discounts of Cattle at Auctions

| Fill    | Percent of Cattle (%) | Steers           |                | Heifers          |                |
|---------|-----------------------|------------------|----------------|------------------|----------------|
|         |                       | Spring (\$/cwt.) | Fall (\$/cwt.) | Spring (\$/cwt.) | Fall (\$/cwt.) |
| Gaunt   | 1.0                   | +1.24*           | +0.15          | +1.31*           | -0.69*         |
| Shrunk  | 12.3                  | +0.56*           | +0.02          | +1.13*           | -0.01          |
| Average | 76.8                  | Base             | Base           | Base             | Base           |
| Full    | 9.8                   | -2.60*           | -0.77*         | -3.20*           | -1.21*         |
| Tanked  | 0.1                   | -7.54*           | -7.78*         | -10.59*          | -7.84*         |

\*Indicates significantly different from zero at the .05 level.

Table 21.5. Effects of Frame Size on Price Discounts of Hereford Feeder Cattle at Auctions

| Frame Size         | Percent of Cattle (%) | Steers (\$/cwt.) | Heifers (\$/cwt.) |
|--------------------|-----------------------|------------------|-------------------|
| Large              | 11.0                  | -1.11            | 1.35              |
| Medium - Upper 1/2 | 72.3                  | Base             | Base              |
| Medium - Lower 1/2 | 15.9                  | -2.13*           | -1.22*            |
| Small              | 0.9                   | -7.69*           | -10.04*           |

\*Indicates significantly different from zero at the .05 level.

Table 21.6. Effects of Breed Type and Frame Size on Price Discounts of Cattle at Auctions

| Breed                     | Percent of Cattle (%) | STEERS<br>Frame Size |                  |                  |        | HEIFERS<br>Frame Size |                  |                  |        |
|---------------------------|-----------------------|----------------------|------------------|------------------|--------|-----------------------|------------------|------------------|--------|
|                           |                       | Large                | Medium Upper 1/2 | Medium Lower 1/2 | Small  | Large                 | Medium Upper 1/2 | Medium Lower 1/2 | Small  |
| Hereford                  | 8.1                   | Base                 | Base             | Base             | Base   | Base                  | Base             | Base             | Base   |
| Angus                     | 7.4                   | -0.54                | -0.73*           | -1.86*           | -4.62* | -2.80*                | -1.10*           | -2.08*           | -0.48  |
| White Face (black or red) | 19.0                  | -0.63                | +0.53*           | +0.93*           | -3.80* | -2.23                 | +0.61*           | +0.10            | -1.47  |
| Other English Crosses     | 0.8                   | -6.24*               | -1.77*           | -1.70*           | -3.56* | -1.13                 | -0.34            | -1.84*           | +0.92  |
| Exotic Crosses            | 21.5                  | +1.29                | +0.66*           | -0.54            | +3.27  | -0.05                 | +0.99*           | -0.74            | +7.77* |
| Brahman less than 1/4     | 5.1                   | -0.70                | -1.65*           | -2.47*           | -3.21  | -1.83*                | -0.81*           | +1.77            | NA     |
| Brahman greater than 1/4  | 0.8                   | -4.15*               | -6.00*           | -8.28*           | NA     | -6.88*                | -4.48*           | -3.83            | NA     |
| Dairy                     | 1.8                   | -6.96*               | -9.04*           | -12.80*          | NA     | -10.45*               | -8.72*           | -4.68*           | NA     |
| Longhorn                  | 0.7                   | -5.18*               | -6.93*           | -2.20            | NA     | -7.93*                | -6.11*           | -4.05*           | NA     |

\*Indicates significantly different from zero at the .05 level.

NA Indicates insufficient observations available for calculation.

Table 21.7. Effects of Quarter of Sale on Price Discounts of Cattle at Auction

| Quarter of Sale | Percent of Cattle (%) | Steers (\$/cwt.) | Heifers (\$/cwt.) |
|-----------------|-----------------------|------------------|-------------------|
| 1st             | 8.2                   | Base             | Base              |
| 2nd             | 66.1                  | +1.99*           | 1.59*             |
| 3rd             | 24.0                  | +1.17*           | 1.17*             |
| 4th             | 1.7                   | +1.24*           | 0.91*             |

\*Indicates significantly different from zero at the .05 level.

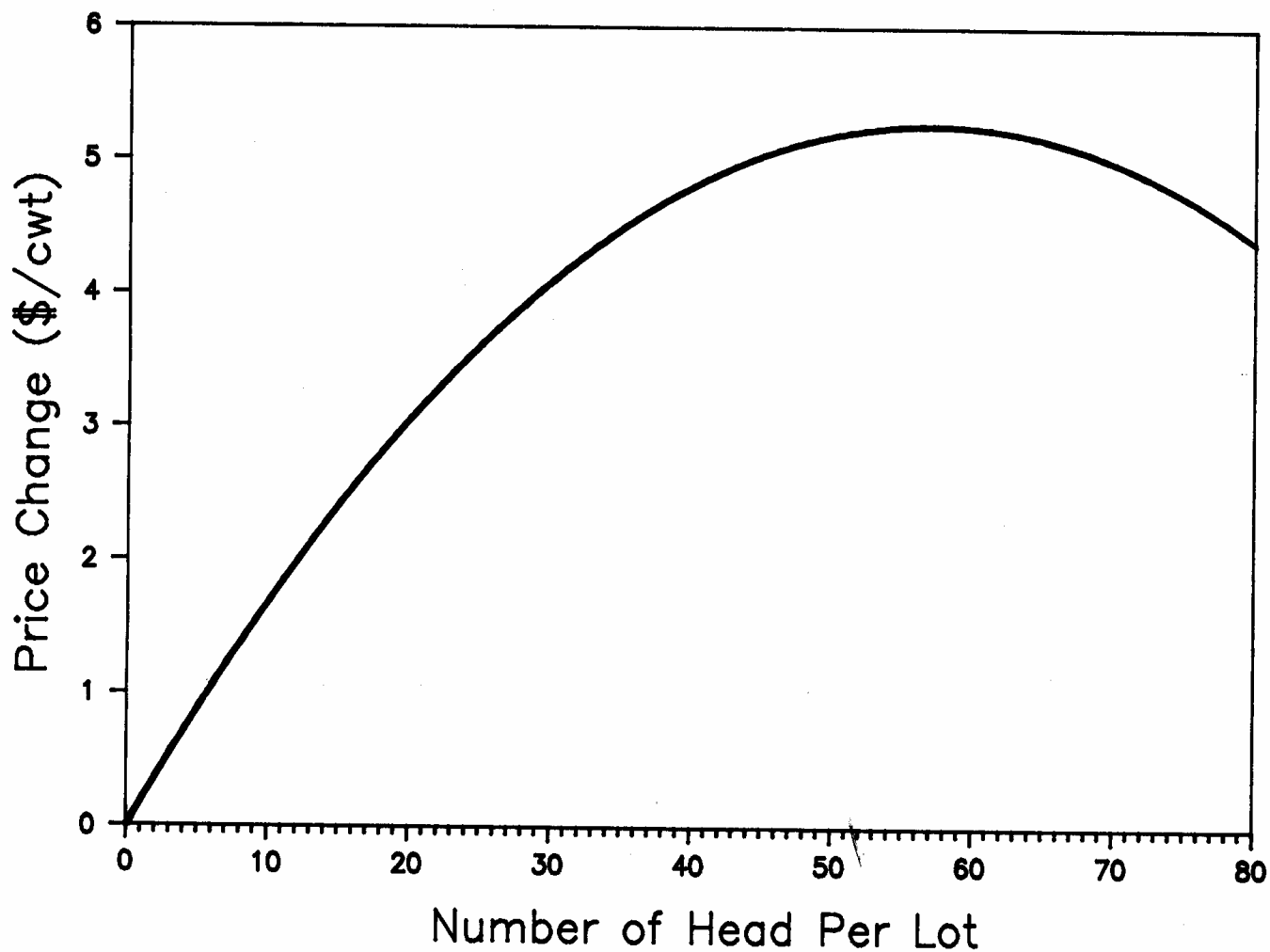


Figure 21.1. Effect of Lot Size on Steer Price