

# FACTORS AFFECTING VARIABILITY IN FEEDLOT STEER PROFITS

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## Summary

This study examined the relative importance of price and animal performance factors on cattle finishing profitability. Using data from a single feedlot, sale prices, feeder prices, and corn prices explained 90 to 95% of the variability in steer profits. About 50% of the variability was explained by fed cattle prices alone. Because sale, feeder, and corn prices have a large impact on profits per head, cattle feeders should attempt to manage the risks associated with these three factors.

(Key Words: Cattle Finishing Profitability, Sale Prices, Feeder Cattle Prices.)

## Introduction

Net returns to cattle feeders vary tremendously over time. Estimated quarterly average returns for finishing yearling steers in Kansas are shown in Figure 1. Estimated returns per head ranged from a loss of \$115 to a profit of \$120 between 1981 and 1991. Profits often varied by \$50 to \$100 per head from one quarter to the next.

What factors contribute to the wide fluctuations in profits over time? Several factors are important in explaining that variability. Feeder and fed cattle prices; the cost of grain, hay and supplement; interest rates; daily gain; feed conversion; and death loss all impact cattle finishing profitability. However, some of these factors are of relatively greater importance. This study used fed cattle closeouts from a western Kansas feedlot to estimate the

relative importance of price and cattle performance factors on finishing profitability.

## Experimental Procedures

Feedlot performance, feed costs, and sale prices were obtained from a western Kansas feedlot's monthly closeouts covering over 2600 pens of steers (540,000 head) placed on feed during the 10-year period from 1980 to 1989. Other data used in the analysis included estimates of corn prices, hay prices, interest rates, feeder prices, and yardage fees. This information was used to calculate monthly average cattle performance, costs, prices, and profits. Table 1 summarizes the monthly performance, cost, and profit information for four categories of steer placement weight. All costs and returns in Table 1 were adjusted for inflation during the period and are expressed in 1989 dollars. Because of seasonality and trends in feeder weights, placement data were not available for all the weight categories during some of the months. Data were available for 106 of the 120 months during the study period.

Profits per head are a function of input prices, performance factors, and sale prices. Specific variables included corn prices, hay prices, interest rates, and feeder cattle prices in the input price category and daily gain, feed conversion, and death loss in the performance category. Regression analysis was used to determine the relative contribution of each variable to the factor in steer profits over time.

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## Results and Discussion

About 98% of the variability in profits per head over time was explained by sale prices, feeder prices, corn prices, interest rates, feed conversion, and daily gain. Feeder prices, corn prices, interest rates, and feed conversion were negatively related to profits, whereas sale prices and daily gain were positively related to profits. Hay prices and death losses did not have a significant influence on profits. Hay prices were probably insignificant because hay represents a minor portion of the feed cost in high concentrate rations. Death loss was probably insignificant because, on a monthly basis, it was relatively stable over the study period. Of course, death loss would be a more important factor in individual pen comparisons.

The relative contribution of sale prices, feeder prices, corn prices, interest rates, feed conversion, and daily gain to the variability in steer profits over time is presented in Table 2. Sale prices had the largest effect

on profits over time. Overall, changes in fed cattle prices explained about 49 to 53% of the variation in cattle feeding profits. Feeder cattle prices explained another 23 to 27% of the profit risk. Corn prices tended to have less influence on profits per head as placement weight increased. For 600-to 700-pound steers, corn prices explained about 22% of the variation in profits, whereas they accounted for only about 15% of the variation for 800- to 900-pound steers. Interest rates, feed conversion, and daily gain explained about 2 to 8% of the variation in steer profits over time.

Based on the results in Table 2, it is evident that placement weight of cattle has a pronounced effect on the relative importance of performance and cost factors to profits. For lighter weight cattle, profit variability was heavily influenced by feed price. Profits for cattle placed on feed at heavier weights were more heavily impacted by feeder costs and daily gains.

**Table 1. Average Costs, Returns, and Performance by Placement Weight for Steers in Western Kansas, 1980-1989<sup>a</sup>**

| Item                             | Steer placement weight |             |             |             |
|----------------------------------|------------------------|-------------|-------------|-------------|
|                                  | 600 to 700#            | 700 to 800# | 800 to 900# | All Weights |
| Days on feed                     | 151                    | 124         | 122         | 137         |
| Average daily gain, lb           | 3.02                   | 3.09        | 3.14        | 3.08        |
| Feed/gain <sup>b</sup>           | 8.55                   | 8.81        | 9.09        | 8.81        |
| Death loss, %                    | 0.78                   | 0.51        | 0.43        | 0.57        |
| Feeder cost, \$/hd               | 557.37                 | 617.43      | 680.10      | 612.35      |
| Feed cost, \$/hd                 | 265.20                 | 247.94      | 233.42      | 251.70      |
| Interest, \$/hd                  | 24.55                  | 23.44       | 22.79       | 23.95       |
| Other costs <sup>c</sup> , \$/hd | 17.54                  | 16.70       | 16.09       | 16.86       |
| Total costs, \$/hd               | 864.66                 | 905.54      | 952.40      | 904.86      |
| Gross returns, \$/hd             | 900.26                 | 933.25      | 972.58      | 932.03      |
| Profit, \$/hd                    | 35.60                  | 27.71       | 20.18       | 27.17       |

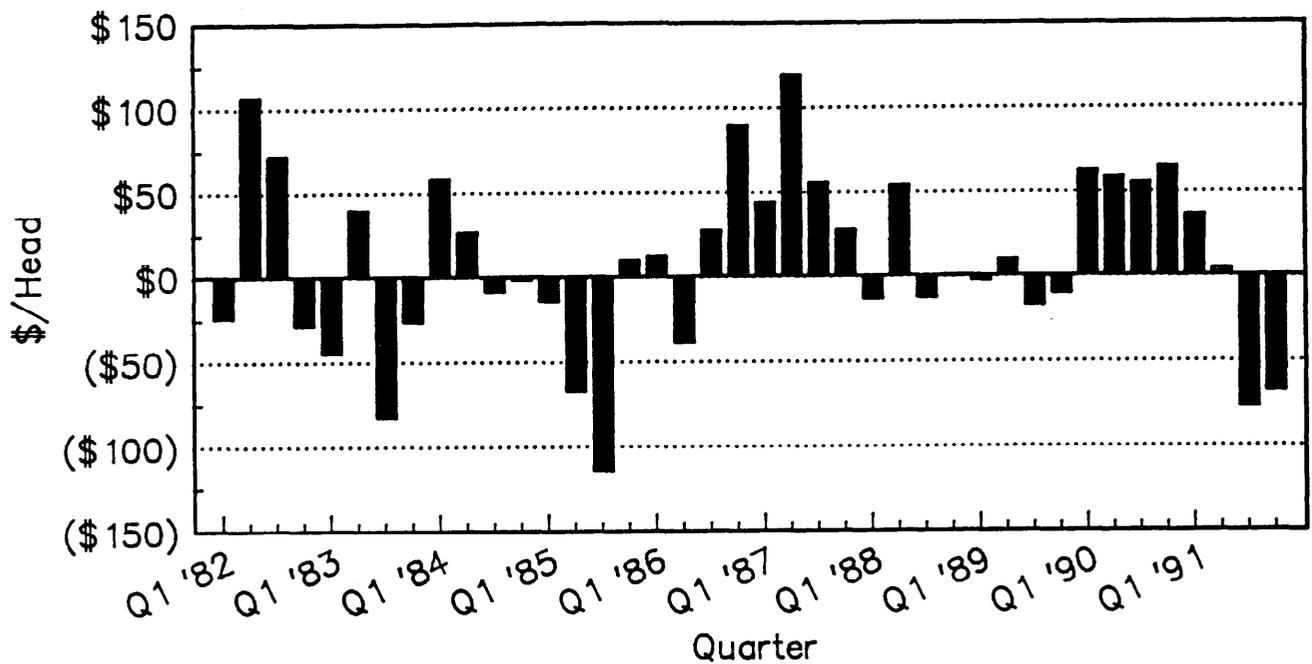
<sup>a</sup>All costs and returns are expressed in 1989 dollars. Data for steers placed in the following months were not available: 2/81, 8/81, 3/82, 9/82, 1/83, 2/83, 3/83, 4/83, 2/85, 3/85, 6/86, 12/88, 1/89, and 2/89. All data provided by a western Kansas commercial feedyard.

<sup>b</sup>Feed conversion is expressed on an as-fed basis.

<sup>c</sup>Other costs include processing and yardage.

**Table 2. Percent of Variation in Steer Finishing Profits Explained by Various Factors**

| Factor                    | Placement Weight |             |             |             |
|---------------------------|------------------|-------------|-------------|-------------|
|                           | 600 to 700#      | 700 to 800# | 800 to 900# | All Weights |
| Sale price                | 48.9             | 52.8        | 49.2        | 50.7        |
| Feeder price              | 22.5             | 26.8        | 25.6        | 27.2        |
| Corn price                | 21.9             | 16.1        | 14.8        | 16.7        |
| Interest rate             | 1.5              | 0.6         | 0.9         | 1.2         |
| Feed conversion           | 3.2              | 1.8         | 3.5         | 2.0         |
| Daily gain                | -0.1             | 0.2         | 4.2         | 0.3         |
| Total explained variation | 97.9             | 98.3        | 98.2        | 98.1        |
| Unexplained variation     | 2.1              | 1.7         | 1.8         | 1.9         |



**Figure 1. Quarterly Returns for Finishing 750-Pound Steers in Kansas.**