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# Factors affecting cattle finishing profitability

## Abstract

The relative contributions of fluctuating cattle performance; interest rates; and feeder cattle, fed cattle, and feed grain prices to profit variability of cattle feeding were examined in this study. Closeout data from 6696 pens of steers placed on feed between January 1980 and May 1991 at two western Kansas custom feedyards were used to estimate the relative impacts of prices and animal performance on cattle feeding profits. Combined, fed and feeder cattle prices explained 70 to 80% of profit variability, depending on placement weight. Overall, cattle prices and feeding costs explained at least 85% of the variation in profitability. Animal performance explained 5 to 10% of profit variability.

## Keywords

Cattlemen's Day, 1993; Kansas Agricultural Experiment Station contribution; no. 93-318-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 678; Beef; Cattle finishing profitability; Sale prices; Feeder cattle prices; Placement weight; Animal performance

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## FACTORS AFFECTING CATTLE FINISHING PROFITABILITY

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and M. L. Albright<sup>1</sup>*

### Summary

The relative contributions of fluctuating cattle performance; interest rates; and feeder cattle, fed cattle, and feed grain prices to profit variability of cattle feeding were examined in this study. Closeout data from 6696 pens of steers placed on feed between January 1980 and May 1991 at two western Kansas custom feedyards were used to estimate the relative impacts of prices and animal performance on cattle feeding profits. Combined, fed and feeder cattle prices explained 70 to 80% of profit variability, depending on placement weight. Overall, cattle prices and feeding costs explained at least 85% of the variation in profitability. Animal performance explained 5 to 10% of profit variability.

(Key Words: Cattle Finishing Profitability, Sale Prices, Feeder Cattle Prices, Placement Weight, Animal Performance.)

### Introduction

This study examined the relative contributions of cattle performance; interest rates; and fed, feeder cattle and corn prices to profit variability of cattle feeding. The potential impact of changing prices and cattle performance on profitability should be considered as cattle producers develop budget projections and contemplate placing cattle on feed. Improvements provided by this analysis relative to previous research include the use of pen-level data instead of monthly

averages, separate profitability analysis for each of three different placement weight categories, and a closeout data set more than twice the size of that used previously.

### Experimental Procedures

Analysis was conducted using closeout data on 6696 pens of steers placed on feed in two western Kansas custom feedyards between January 1980 and May 1991. Information collected from the closeouts included placement date, feeder cattle purchase price, placement weight, days on feed, total gain, daily gain, sale weight, feed conversion (as-fed), yardage charges, feed cost, feed consumption (as-fed), feeding cost per pound of gain, fed cattle sale price, and slaughter date. Average monthly southwestern Kansas corn prices were obtained from Kansas Agricultural Statistics. Interest rates on feeder cattle loans were obtained from the Kansas City Federal Reserve Bank. Only pens of steers placed on feed weighing between 600 and 899 lb were used in this analysis. All prices, returns, and costs were adjusted for inflation by expressing them in January 1991 constant dollars.

Net returns were estimated as a function of fed cattle price, feeder cattle purchase price, corn price, feed conversion, daily gain and feeder cattle interest rate in a regression equation. Estimates from the regression equation were used to calculate coefficients of separate determination that allocate the total variability explained by these factors

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as a group into their individual explanatory contributions to net return risk. The model used did not include seasonal factors.

### **Results and Discussion**

Figure 1 illustrates the estimated, monthly, average, real, net returns to finishing 700 to 799 lb feeder steers over the 1980 through May 1991 placement period. Real (adjusted to 1991 dollars) profits averaged \$43.30 to \$49.36/head, and nominal profits (unadjusted for inflation) averaged \$25.38 to \$27.28/head, depending on placement weight. Feed conversion (as-fed) increased from 8.24 for lighter weight placements to 8.57 for heavier placements, reflecting reduced feed efficiency of heavier cattle. Average daily gain was also greater for heavier compared to lighter weight placements (3.25 vs 3.06 lb). Nominal cost of gain averaged from \$48 to \$50/cwt, depending on placement weight.

Table 1 presents the relative contributions of fed, feeder, and corn prices; interest rates; feed conversion; and daily gain to the variability in steer profits. Fed cattle price was the most important explanatory factor for lighter weight placed steers, explaining more than 50% of the profit variance and was the second most important factor for the 800 to 899 lb placement category, explaining 38% of profit variation. Feeder cattle purchase price was the most important variable for heavy weight placements, explaining 42% of total profit variability, but represented the second most important variable for the two lighter weight categories. Together, fed and feeder cattle prices explained from 70% to 80% of total profit variance.

Corn price was the third most important contributor to profit variance across all feeder weight categories. However, the impact of corn price was considerably greater for 600 to 699 lb placements, explaining 16% of this category's profit variance compared to 6% for 800 to 899 lb placements. Lighter weight placements consume considerably more total feed over the finishing period relative to heavier cattle. As a result, the profitability of light weight placements was more dependent upon fluctuating corn prices.

Feed conversion was the next most important explanatory variable, explaining 3% to 5% of profit variance. Finally, interest rates and daily gain combined explained approximately 2% to 4% of profit variance. Average daily gain was more important for cattle placed at heavier weights than for lighter weight cattle, reflecting the need to finish the expensive, heavy cattle quickly. Overall, animal performance explained 5% to 10% of profit risk.

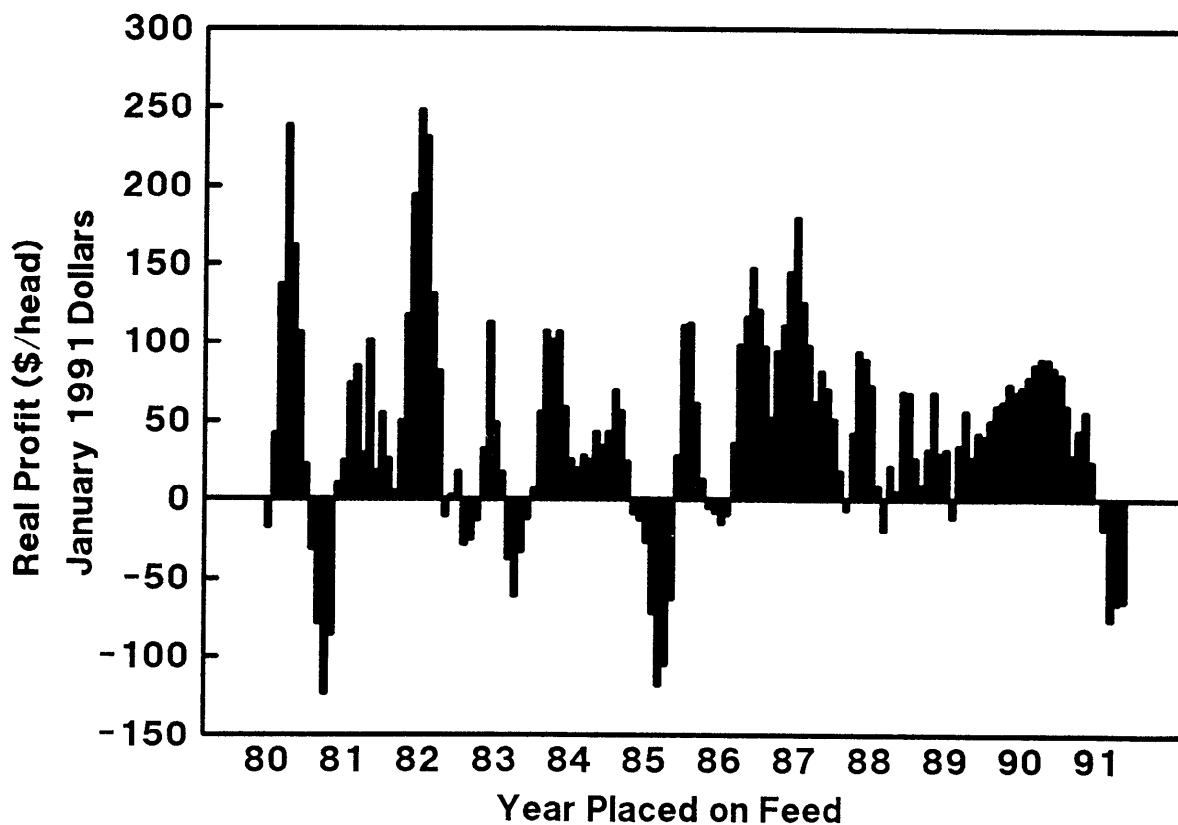
Procurement or marketing strategies that help manage cattle price risk significantly influence profit risk. Producers placing light weight cattle need to be more concerned with fed cattle sale prices than those placing heavier cattle, because lighter cattle are on feed longer, allowing more time for significant fed cattle price changes between placement and slaughter. Producers placing light weight cattle should also be more concerned with feed grain price changes. Purchase price is the most important variable affecting profit for feeding heavy weight cattle. Feeding costs tend to be less critical with heavier placement weights than with lighter weights.

**Table 1. Percentage of Total Explained Variability in Net Return of Steer Feeding over Time Attributable to Selected Factors, by Placement Weight, January 1980 to May 1991**

Explanatory variable	Feeder placement weight		
	600 to 699 lb	700 to 799 lb	800 to 899 lb
- - - - - % variability in net return explained - - - - -			
Fed price	54.3	54.2	38.0
Feeder price	16.9	24.8	41.6
Corn price	15.9	8.9	6.3
Interest rate	2.2	1.0	-0.2
Feed conversion	3.1	3.5	4.8
Daily gain	0.4	1.4	3.7
Total explained <sup>a</sup>	92.8	93.8	94.3
Unexplained variability <sup>b</sup>	7.2	6.2	5.7

<sup>a</sup>Total percentage of variability in net return explained by variability in the explanatory variables.

<sup>b</sup>Unexplained variability is 100 minus total explained.



**Figure 1. Monthly Average Profit from Feeding 700 to 799 lb Steers, Placed on Feed January 1980 through May 1991**