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Abstract

This study examined the impacts of animal health and death loss on the economic performance of feedlot cattle. Using data from two feedlots in western Kansas, the impact of animal health on economic performance was quantified. Death loss and the percentage of animals treated significantly impacted feed conversion, average daily gain, and cost of gain. Feed conversion for a pen of cattle was found to increase by 0.27 lb feed/lb gain and daily gain decreased by 0.08 lb/day for each percentage point increase in death loss. An increase in death loss from 1% to 2% increased cost of gain by $2.29/100 lb gain.

Keywords

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ESTIMATING THE IMPACT OF ANIMAL HEALTH AND DEATH LOSS ON ECONOMIC PERFORMANCE OF FEEDLOT CATTLE

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Summary

This study examined the impacts of animal health and death loss on the economic performance of feedlot cattle. Using data from two feedlots in western Kansas, the impact of animal health on economic performance was quantified. Death loss and the percentage of animals treated significantly impacted feed conversion, average daily gain, and cost of gain. Feed conversion for a pen of cattle was found to increase by 0.27 lb feed/lb gain and daily gain decreased by 0.08 lb/day for each percentage point increase in death loss. An increase in death loss from 1% to 2% increased cost of gain by $2.29/100 lb gain.

Introduction

The cattle feeding industry is a capital intensive, high-risk business that relies heavily on economies of scale to minimize costs and maximize returns. Profit margins for fed cattle are often small and variable while losses can be large. One of the tools cattle feeders can utilize in managing economic risk is to continually evaluate or estimate the performance of cattle currently on feed as well as those being purchased.

There are numerous variables that impact the performance of feedlot cattle. Some variables are more easily managed than others. Examples of variables that are easier to manage are purchase weight, origin of cattle, type of cattle, genetic makeup, and background. Other variables, such as animal health, are more difficult to control. This study focused on the impact of animal health and death loss on economic performance of feedlot cattle.

Experimental Procedures

Feedlot data pertaining to head count, gender, death loss, number of cattle treated, date in, date out, days of feed, weight in, weight out, gain per head, feed conversion (dry matter basis), average daily gain, cost of gain, feed consumption per head (dry matter basis), ration cost, non-feed cost, origin, and background were collected from customer closeouts for two western Kansas commercial feedlots. Data were collected for steers, heifers, and mixed pens of cattle placed on feed from August 2000 through January 2001. The total number of pens was 673 (53,890 cattle).

Regression analysis was used to examine the impact of death loss on feed conversion, average daily gain, and non-feed cost. Non-feed cost included the cost of medicine to treat cattle, processing, metaphylaxis, yardage, association dues, and insurance. The non-feed cost model was used to investigate the portion of cost of gain not accounted for by feed. Independent variables included in the feed conversion, average daily gain, and non-feed cost regressions included death loss, average in

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weight, average out weight, and dummy variables for gender of cattle in the pen, quarter of the year in which cattle were closed out, origin of the cattle, background of the cattle, and feedlot. Death loss was expected to be positively related to feed conversion (feed/gain) and non-feed cost, and negatively related to average daily gain.

A spreadsheet was utilized to examine the impact of animal health on cost of gain. This spreadsheet incorporated information from the feed conversion, average daily gain, and non-feed cost regressions. Ration cost was held at the average level for the study period to estimate cost of gain.

The percentage of animals treated was regressed on death loss to examine the impact of animals treated on death loss. A positive relationship between these two variables was expected.

Results and Discussion

Table 1 provides summary statistics for the data collected. Average death loss and percentage of animals treated were 2.30% and 13.62%, respectively. The percentage of animals treated was expressed as a percentage of cattle received and included cattle retreated. Average feed conversion, daily gain, and cost of gain were 6.67 lb feed/lb gain, 3.24 lb/day, and $53.20/100 lb gain, respectively.

The estimated regression coefficient for death loss in the feed conversion regression model was 0.27 ($P<0.01$). Thus, for every percentage point increase in death loss, holding all other independent variables constant, feed conversion for a pen of cattle increased by 0.27 lb feed/lb gain. Table 2 illustrates estimated feed conversion levels for death loss ranging from 1% to 10%.

The estimated regression coefficient for death loss in the average daily gain regression model was 0.08 ($P<0.01$). Thus, average daily gain for a pen of cattle decreased by 0.08 lb/day for each percentage point increase in death loss, when holding the other independent variables constant. Table 2 contains average daily gain estimates for death loss ranging from 1% to 10%.

Each percentage point increase in death loss resulted in a $1.00 per head increase in non-feed cost. Table 2 illustrates costs of gain for death loss ranging from 1% to 10%. These results reveal the sensitivity of fed cattle economic performance to changes in death loss. For a 2% death loss, feed conversion was 6.79 lb feed/lb gain, average daily gain was 3.17 lb/day, and cost of gain was $54.05/100 lb gain. For a 4% death loss, feed conversion was 7.32 lb feed/lb gain, average daily gain was 3.02 lb/day, and cost of gain was $58.51/100 lb gain. The higher cost of gain was due to a higher feed conversion level (which led to higher feed cost), a lower average daily gain, and higher non-feed cost.

Results of the regression examining the relationship between death loss and percentage of animals treated revealed a significant relationship ($P<0.01$). The estimated regression coefficient for percentage of animals treated was 0.14. Thus, for every percentage point increase in the percentage of animals treated, death loss increased by 0.14 percentage points, which results in an increase in feed conversion and cost of gain, and a decline in average daily gain.

Table 1. Summary Statistics for Fed Cattle Closeouts, August 2000 to January 2001

Variable	Unit	Average	Standard Deviation
Cattle per pen	No.	80	41
Death loss	%	2.30	3.83
Animals treated	%	13.62	17.76
Days of feed	No.	148.43	29.17
In weight	lb	756.33	113.63
Out weight	lb	1256.95	107.32
Gain per head	lb	500.62	77.40
Feed conversion	lb feed/lb gain	6.67	1.60
Feed consumption	lb/day	21.05	2.87
Average daily gain	lb/day	3.24	0.61
Cost of gain	$/cwt	53.20	15.66
Ration cost	$/ton	143.83	3.73
Added cost	$/head	22.57	8.81
Steers	%	49.33	50.03
Heifers	%	32.69	46.94
Mixed	%	17.98	38.43
First quarter	%	23.63	42.51
Second quarter	%	19.02	39.27
Third quarter	%	25.56	43.65
Fourth quarter	%	31.80	46.60
Kansas origin	%	36.26	48.11
Oklahoma origin	%	8.77	28.30
Texas origin	%	4.31	20.32
Southeast origin	%	45.02	49.79
Northeast origin	%	5.65	23.10
Sale barn	%	51.56	50.01
Preconditioned	%	18.87	39.16
Grass Background	%	25.41	43.57
Wheat Background	%	4.16	19.98
Feedlot 1	%	69.84	45.93
Feedlot 2	%	30.16	45.93

Table 2. Impact of Death Loss on Fed Cattle Performance

Death Loss	Feed Conversion (lb feed/lb gain)	Average Daily Gain (lb/day)	Cost of Gain ($/100 lb)
1%	6.52	3.25	51.76
2%	6.79	3.17	54.05
3%	7.05	3.09	56.18
4%	7.32	3.02	58.51
5%	7.59	2.94	60.87
6%	7.86	2.86	63.26
7%	8.12	2.78	65.68
8%	8.39	2.71	67.85
9%	8.66	2.63	70.32
10%	8.93	2.55	72.85