Kansas Agricultural Experiment Station Research Reports

Volume 7
Issue 1 *Cattlemen's Day*

Article 5

2021

Effect of Trucking Distance on Sale Price of Beef Calf and Feeder Cattle Lots Sold Through Video Auctions from 2010 Through 2018

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Abstract

Objective: The objective was to determine effect of trucking distance on sale price of beef calf and feeder cattle lots sold through Superior Livestock Video Auctions from 2010 through 2018.

Study Description: Data analyzed were collected from 211 livestock video auctions that included 42,043 beef calf and 19,680 feeder cattle lots delivered to 6 states (Colorado, Iowa, Kansas, Nebraska, Oklahoma, and Texas). Multiple regression models were used to evaluate the effect of factors, with trucking distance of main interest, on sale price of lots. Based on reported states of origin and delivery, lots were categorized into one of the following trucking distance categories: 1) within-state, 2) short-haul, 3) medium-haul, and 4) long-haul.

Results: Beef calf lots hauled within-state sold for more ($169.24/cwt; $P < 0.0001$) than other trucking distance categories. Long-haul calf lots sold for the lowest ($P < 0.0001$) price ($166.70/cwt). Within-state and short-haul feeder cattle lots sold for the greatest ($P < 0.0001$) price ($149.96 and $149.81/cwt, respectively). Long-haul feeder cattle lots sold for the lowest ($P < 0.0001$) price, $148.43/cwt.

The Bottom Line: These results indicate there is a price advantage for lots expected to be hauled shorter distances, likely because of cost and risk associated with transportation

Keywords

beef calf lots, feeder cattle lots, trucking distance

Authors

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K-STATE Research and Extension

CATTLEMEN'S DAY 2021

KANSAS STATE UNIVERSITY CATTLEMEN'S DAY

Effect of Trucking Distance on Sale Price of Beef Calf and Feeder Cattle Lots Sold Through Video Auctions from 2010 Through 2018

E.D. McCabe, M.E. King, K.E. Fike, M.J. Smith, G.M. Rogers,[1] *and K.G. Odde*

Abstract

The objective was to determine the effect of trucking distance on the sale price of beef calf and feeder cattle lots sold through Superior Livestock Video Auctions from 2010 through 2018. Data analyzed were collected from 211 livestock video auctions. There were 42,043 beef calf lots and 19,680 feeder cattle lots used in these analyses. Six states (Colorado, Iowa, Kansas, Nebraska, Oklahoma, and Texas) of delivery comprised 70% of calf lots and 83% of feeder cattle lots and were used in these analyses. All lot characteristics that could be accurately quantified or categorized were used to develop multiple regression models that evaluated effects of independent factors using backwards selection. A value of $P < 0.05$ was used to maintain a factor in the final models. Based upon reported state of origin and state of delivery, lots were categorized into one of the following trucking distance categories: 1) within-state, 2) short-haul, 3) medium-haul, and 4) long-haul. Average weight and number of calves in lots analyzed was 571.4 ± 84.7 lb and 100.6 ± 74.3 head, respectively. Average weight and number of feeder cattle in lots analyzed was 790.1 ± 75.6 lb and 110.6 ± 104.1 head, respectively. Beef calf lots hauled within-state sold for more ($169.24/cwt; $P < 0.0001$) than other trucking distance categories. The long-haul calf lots sold for the lowest ($P < 0.0001$) price ($166.70/cwt). Within-state and short-haul feeder cattle lots sold for the greatest ($P < 0.0001$) prices ($149.96 and $149.81/cwt, respectively). Long-haul feeder cattle lots sold for the lowest ($P < 0.0001$) price ($148.43/cwt).

Introduction

Beef cattle production occurs throughout the United States. The vast majority of cattle feeding, however, is concentrated in the plains closer to feed resources. This means beef calves must eventually travel from throughout the United States towards the plains for finishing. There are costs and risks associated with the transportation of beef calves and feeder cattle. Some of the risks associated with transportation impact overall health, including injury and stress. Previously, we evaluated the effect of state origin on sale

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price for lots of beef calves. These results indicated lots originating from states that were closer to where cattle are finished sold for higher sale prices. Thus, the objective was to determine the effect of trucking distance on sale price of beef calf and feeder cattle lots sold through Superior Livestock Video Auctions from 2010 through 2018.

Experimental Procedures

Information describing factors about lots of beef calves and feeder cattle sold through a livestock video auction service (Superior Livestock Auction, Fort Worth, TX) was obtained from the auction service in an electronic format. These data were collected for lots of beef calves and feeder cattle sold from 2010 through 2018. The unit of study was a lot of beef calves or a lot of feeder cattle.

Data available for each lot included:

- Auction year
- Gender of the lot
- Lot size (linear and quadratic)
- Base weight (linear and quadratic)
- Mixed gender lot
- Breed description
- Health protocol administration
- Region of United States lot originated from
- Number of days between auction and forecasted delivery dates
- Weight variation
- Presence of horns
- Implant status
- Frame score
- Flesh score
- Whether the lot qualified for one or more of these programs: Bovine Viral Diarrhea Persistently Infected free, Source and Age verified, Beef Quality Assurance, Superior Progressive Genetics, Non-Hormone Treated Cattle program, or Certified Natural program
- Sale price of lot ($/cwt)

The top six states in number of lots delivered to the state were included in these analyses. The top six delivery states were Colorado, Iowa, Kansas, Nebraska, Oklahoma, and Texas. Lots were categorized into one of four trucking distance categories: 1) within-state, 2) short-haul, 3) medium-haul, and 4) long-haul. Lots categorized as within-state originated and were delivered within the same state. Lots categorized as short-haul were approximately one state away from the delivery state. Lots were determined as short-haul based on their originating state and delivered to one of the top six delivery states: Colorado (origins were: Kansas, Nebraska, Oklahoma, New Mexico, Utah, and Wyoming); Iowa (origins were: Illinois, Kansas, Minnesota, Missouri, Nebraska, South Dakota, and Wisconsin); Kansas (origins were: Colorado, Missouri, Nebraska, and Oklahoma); Nebraska (origins were: Colorado, Iowa, Kansas, Missouri, South Dakota, and Wyoming); Oklahoma (origins were: Arkansas, Colorado, Kansas, Louisiana, Missouri, New Mexico, and Texas); Texas (origins were: Arkansas, Louisiana, New Mexico, and Oklahoma). Lots categorized as medium-haul were approximately two states away from the delivery state. Lots were determined

as medium-haul based on their originating state and delivered to one of the top six delivery states: Colorado (origins were: Iowa, Missouri, South Dakota, and Texas); Iowa (origins were: Indiana, Missouri, North Dakota, and Oklahoma); Kansas (origins were: Arkansas, Iowa, New Mexico, and South Dakota); Nebraska (origins were: Arkansas, Illinois, Minnesota, Montana, North Dakota, Oklahoma, and Wisconsin); Oklahoma (origins were: Arizona, Illinois, Iowa, Kentucky, Mississippi, Nebraska, and Tennessee); Texas (origins were: Colorado, Kansas, Mississippi, and Missouri). Lots were determined as long-haul based on their originating state and delivered to one of the top six delivery states. This category included all other states not previously listed as originating states for each of the top six delivery states.

Separate multiple-regression models, one for beef calf lots and one for feeder cattle lots, were developed using a backwards selection procedure to quantify effects of independent factors on the sale price of beef calves. Each model was adjusted for the random effect of auction date nested within auction year. The multiple regression models included the 22 variables provided by the video auction service in addition to the trucking distance category. The variable of interest in this study was trucking distance.

Results and Discussion

Data analyzed were collected from 211 livestock video auctions from 2010 through 2018. Six states (Colorado, Iowa, Kansas, Nebraska, Oklahoma, and Texas) of delivery comprised 70% of calf lots and 83% of feeder cattle lots and were used in these analyses. There were 42,043 beef calf lots and 19,680 feeder cattle lots used in these analyses. Average weight and number of calves in lots analyzed was 571.4 ± 84.7 lb and 100.6 ± 74.3 head, respectively. Average weight and number of feeder cattle in lots analyzed was 790.1 ± 75.6 lb and 110.6 ± 104.1 head, respectively.

For beef calf lots the presence of horns, implant status, and bovine viral diarrhea persistently infected tested did not affect sale price while the other 20 variables did affect sale price and remained in the model. Regarding trucking distance, beef calf lots hauled within-state sold for more ($169.24/cwt; $P < 0.05$) than other trucking distance categories (Figure 1). The short-haul calf lots sold for the second greatest ($P < 0.05$) sale price ($168.77/cwt). The medium-haul calf lots sold for the third greatest ($P < 0.05$) sale price ($167.58/cwt). The long-haul calf lots sold for the lowest ($P < 0.05$) price ($166.70/cwt). Transportation of calves in general causes live weight loss. In addition, the commingling of calves, potential for fluctuations in weather conditions, and additional animal handling add stressors associated with increased risk for developing health issues. It appears hauling distance may be related to perceived risk for the buyer in that they are willing to pay more for calves hauled shorter distances perhaps due to less detrimental effects on performance and less cost associated with transport.

For feeder cattle lots, presence of horns did not affect sale price while the other 22 variables did affect sale price and remained in the model. Regarding trucking distance, within-state and short-haul feeder cattle lots sold for the greatest ($P < 0.05$) prices ($149.96 and $149.81/cwt, respectively; Figure 2). The medium-haul feeder cattle lots sold for the second greatest ($P < 0.05$) sale price ($149.25/cwt). The long-haul feeder cattle lots sold for the lowest ($P < 0.05$) price, $148.43/cwt. Similar to beef calf lots,

buyers were generally willing to pay more/cwt for feeder cattle hauled shorter distances. Interestingly, the price difference between each trucking distance category within feeder cattle lots was less than for beef calf lots, likely because feeder cattle are typically lower-risk animals incurring less potentially detrimental effects in performance and cost associated with trucking distance.

Implications

These results indicate there is a price advantage for lots expected to be hauled shorter distances, likely because of cost and risk associated with transportation.

Figure 1. The effect of trucking distance on sale price of beef calf lots sold through 211 Superior Livestock Auction video sales from 2010 through 2018.
[a,b,c,d] $P < 0.05$.

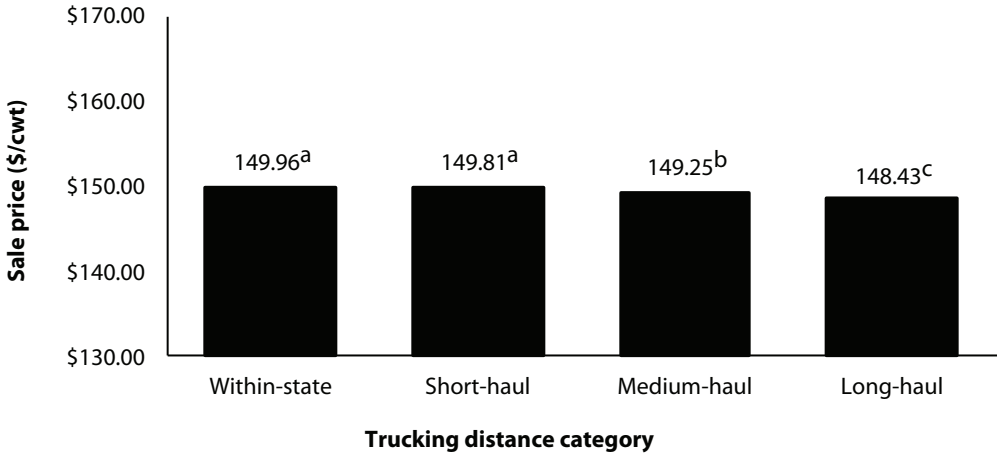

Figure 2. The effect of trucking distance on sale price of feeder cattle lots sold through 211 Superior Livestock Auction video sales from 2010 through 2018.
[a,b,c] $P < 0.05$.