

Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 1 *Cattleman's Day (1993-2014)*

Article 780

1992

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Recommended Citation

Mintert, J.; Jones, R.; Brazle, F.; and Schroeder, Ted C. (1992) "Short-run impact of captive supplies on fed cattle prices," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 1. <https://doi.org/10.4148/2378-5977.2183>

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Short-run impact of captive supplies on fed cattle prices

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SHORT-RUN IMPACT OF CAPTIVE SUPPLIES ON FED CATTLE PRICES¹

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Summary

Factors affecting western Kansas fed cattle prices during May through November 1990 were investigated. In particular, the impact of changes in captive cattle supplies on cash prices was examined. The term captive cattle supplies refers to cattle procured by a packer well in advance of slaughter. Captive supplies take one of three forms: 1) packer-owned cattle, 2) cattle procured on forward contracts, and 3) cattle procured under formula price (or marketing) agreements. Captive supplies were defined as cattle procured under forward contracts or formula price agreements, because data on packer-owned cattle were unavailable. Over the May through November 1990 period as a whole, the presence of captive cattle supplies was associated with an average reduction in western Kansas cash market transaction prices of about \$0.15/cwt.

(Key Words: Cattle Marketing, Cattle Prices, Captive Supplies.)

Introduction

A cash fed cattle price model was developed to explain the variation in prices of individual pens of fed cattle as a function of each pen's quality characteristics, market conditions, and the level of captive supplies.

Important quality factors included animal weight, finish uniformity, percentage of cattle expected to grade Choice and Select, estimated dressing percentage, percentage of cattle expected yield grade 4, number of brands, sex, breed type, and the number of cattle purchased by the packer from the feedyard on the same day. In addition, distance from the packer to the feedyard and the identity of the packer purchasing the cattle were included.

Market conditions refer to supply and demand in the local fed cattle market. To account for the impact of Choice and Select grade boxed beef prices on the demand for live cattle, an estimated carcass value of each pen was computed and included in the model. Inclusion of live cattle futures prices captured the impact of changing national cattle prices on local cash prices. Other short-run demand factors included in the model were local marketings of fed cattle, day of the week the cattle were sold, number of bids received on a pen of cattle during the week the cattle were sold, and number of days between sale date and the packer delivery date. Captive supplies, measured as the USDA estimate of formula and contract shipments from Kansas feedyards during the delivery week of each pen divided by total weekly Kansas slaughter, were also included in the model.

¹This research was supported by funds from the Research Institute on Livestock Pricing and the Kansas State Agricultural Experiment Station.

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Experimental Procedures

Data were collected on individual sale transactions from 1407 pens of cattle representing 166,338 head from May 21 through November 24, 1990 from 13 feedyards in western Kansas. For each pen of cattle sold, a record was made of price bids, feedyard and animal quality characteristics, market conditions, and the level of captive supplies. The number of captive supply cattle shipped for slaughter each week from Kansas feedyards was collected from the USDA's Agricultural Marketing Service in Dodge City, Kansas. The percentage of Kansas cattle slaughter represented by formula and contract cattle during May through November of 1990 ranged from 2% to 15% of weekly slaughter volume.

Results and Discussion

The estimated price impacts of selected factors are presented in Table 1. The premiums and discounts represent average incremental price effects across all pens of cattle estimated using regression analysis. Each reported premium or discount is the isolated price impact of changing that pen characteristic while holding all other factors constant.

The level of captive supplies had a significant negative influence on price. During the May through November period, each 1% increase in contract and formula cattle shipments from Kansas feedyards as a percentage of total Kansas slaughter was associated with an average transaction price decline of \$0.026/cwt. During the 6-month study, captive supplies averaged about 6% of Kansas steer and heifer slaughter. This level of captive supplies was associated with an average cash fed cattle price decline of approximately \$0.15/cwt in western Kansas.

Because of variability in contracting activity during the study period, the fed cattle price model was reestimated for three shorter

intervals to provide insight into the price impact of the level of captive supplies over different time periods. The periods examined were May to July, August to September, and October to November. During May through July, each 1% increase in captive supplies was associated with an average transaction price decline of \$0.036/cwt. Captive supplies averaged greater than 9% of Kansas steer and heifer slaughter during late May through July, and were associated with an average price decline of approximately \$0.34/cwt. Estimated price impacts of aggregate captive supplies during August-September and October-November were not statistically significant (Figure 1).

Limitations of Study

Several caveats about the results of this study should be mentioned. First, the results may be sensitive to the market conditions during the data collection period and to the western Kansas marketing region. The market structure, local supply and demand, and other factors unique to this time frame and area make it difficult to generalize from these results. Second, although detailed data were collected on cash market transactions, we have no knowledge of the cattle characteristics or of the prices received for captive supply cattle. Therefore, the net price effect of captive supplies across all cattle slaughtered is unknown. Finally, captive supplies during the study period varied from 2 to 15% of Kansas steer and heifer slaughter. The estimated price changes associated with shifts in captive cattle supplies should not be construed to apply to levels of captive supplies outside the range observed during the May through November period. For example, it would be inappropriate to use these results to estimate the price impact arising from 50% of Kansas steer and heifer slaughter coming from captive supplies, because captive supplies were never that large during the data collection period.

Table 1. Premiums and Discounts Associated with Various Pen Traits, Western Kansas, May to November, 1990

Pen Trait	Estimated Price Impact \$/cwt
Day of the week cattle were sold:	
Monday	Base
Tuesday	-0.04
Wednesday	-0.31
Thursday	-0.37
Friday	-0.49
Additional bid	0.07
Additional day between sale and delivery	0.01

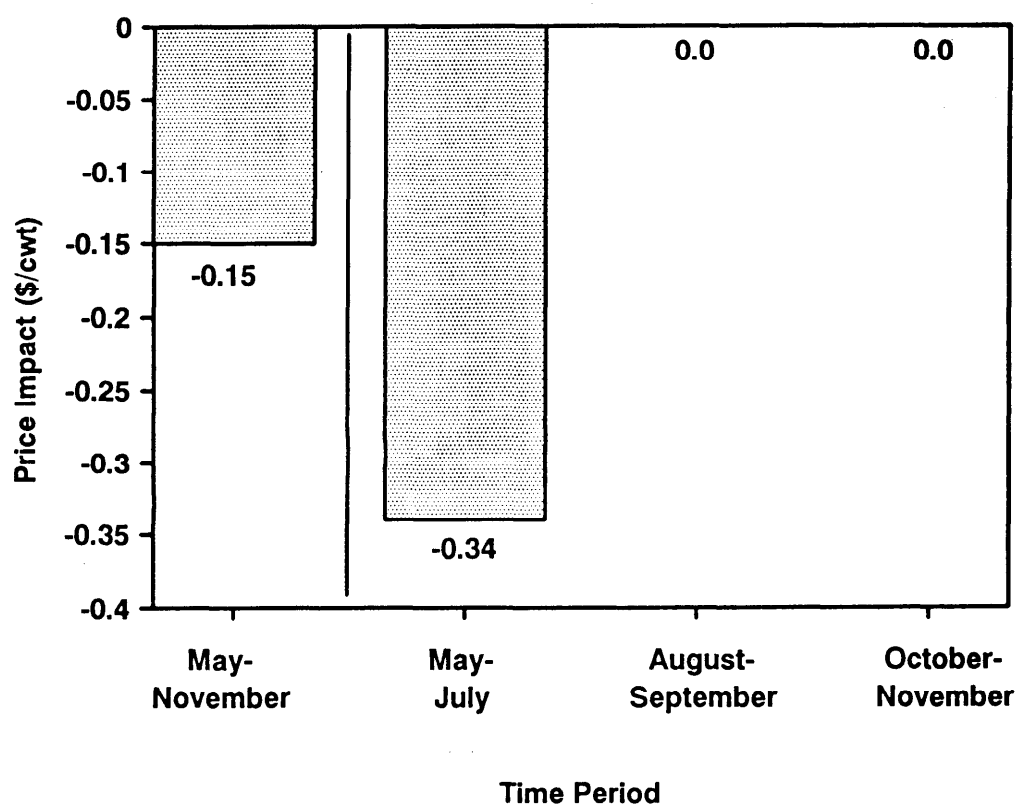


Figure 1. Estimated Average Impact of Captive Cattle Supplies on Western Kansas Fed Cattle Transaction Prices, May through November 1990.