Estimating the Value of Source Verification in Iowa Feeder Cattle Markets[1]

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Summary

Source verification and pooling of feeder cattle into larger lots resulted in higher selling prices compared to more typical sales at a southern Iowa auction market. After higher prices due to larger lot sizes were accounted for, cattle that received a specified management program and were source verified as to origin received additional price premiums. The data do not distinguish between the value of the specific management program and the value of the source verification process. However, cow–calf producers participating in the program took home more money.

Introduction

Source verification (SV) has various definitions. For this discussion, it is defined as the process of identifying the origin and ownership of cattle and the management practices they have received. With SV, it is possible to assemble like kinds of cattle from many small operators into uniform groups to form larger lot sizes and give the buyer confidence in the type of cattle being purchased. Depending on the program, sellers who participate in SV may have to agree to a number of conditions concerning management and handling of their cattle prior to sale. Clearly defined protocol and identification of origin are expected to increase the price that prospective buyers are willing to offer.

Pooling is the process of sorting cattle of similar weight, sex, frame size, muscling, etc., into larger lot sizes. The animals are tagged, allowing each animal to be identified and verified back to the source. Auction market operators or government graders inspect the animals and assign grades. Thus cattle, although grouped into larger lot sizes, still maintain individual identity and can be traced to the producer who sold them. The cattle also may have similar health management programs. Common presale management practices increase the similarities of the cattle. Pooling allows buyers to buy larger, uniform lots of cattle.

Factors Influencing Feeder Cattle Prices

Research that identifies the factors that influence feeder cattle prices has focused exclusively on market characteristics and on cattle and lot characteristics. The seller can and does influence cattle and lot characteristics to some extent, but has little or no influence on market conditions.

Cattle and lot characteristics include health, frame, breed, weight, color, sex, age, fill of feeder cattle, presence or absence of horns, lot size, and uniformity within the lot. Market characteristics include time of sale, time of year, fed and feeder cattle futures prices, corn futures price, number of buyers at auction, and number of lots offered for sale on a given day. (Another study looked at the impact of the reputation of the seller in addition to the market, lot, and cattle characteristics on feeder cattle prices. The reputation of the seller was found to be significant only in markets that transfer less information to buyers.)

Current Trends in Feeder Cattle Marketing

Studies have shown that some sales programs mirroring SV do produce price premiums. Graded sales aim to assemble like kinds of cattle from small– to mid–size cow–calf operations into uniform groups in order to raise the price prospective buyers are willing to offer. One study reported that premiums for graded calves sold in larger pens ranged from $4.00–$8.00/cwt. Another study reported that graded sales averaged 2– 8¢/lb over weekly sales (traditional auctions).

The main objective of the study was to use statistical analysis to determine if SV and/or pooling of feeder cattle result in higher prices compared with the traditional live auction sale prices of feeder cattle in Iowa.

Methods and Materials

Feeder cattle auction prices and characteristics were obtained from the Bloomfield Auction Market, Bloomfield, Iowa, each fall from 1997 to 2000. The SV sales are part of the Iowa Missouri Beef Improvement Organization (IMBIO), organized by the Bloomfield Auction Market. IMBIO determines the requirements for cattle in special sales, including the health program administered by an approved veterinarian. Each calf must have an IMBIO ear tag with a unique number that can be traced to the individual farm.

Buyers and sellers were informed in advance of the specific dates on which IMBIO source-verified sales would occur. On the day of the sale, sellers delivered feeder cattle to the auction market, where they were sorted into larger lot sizes by sex, weight, frame, breed, and color. The selling weight was taken during the sorting process, before cattle

[1] This report continues a study published in the 2000 Beef Research Report by the same title. The previous study examined data collected in the years 1997–1998; this study examines data collected in the first study plus data collected in 1999–2000.

were pooled. Individual lots may have contained cattle from several sellers. The pooled lot size was targeted to equal half or whole truckloads, by weight, of similar type cattle. The pooled lots were auctioned in the evening.

Data

Feeder cattle price data were obtained from USDA Agricultural Market Service (AMS), collected for all Bloomfield Auction Market sales. There were 12 traditional auctions in 1997, 13 in 1998, 11 in 1999, and 8 in 2000. Source verified sales occurred once in October, November, and December of each year. There were a total of 3,917 observations (lots of cattle) comprising 358 IMBIO SV observations and 3,559 traditional observations. Weekly average north-central Iowa cash corn prices and day-of-sale closing feeder cattle futures prices were collected for each auction.

Pricing Model

The model used in this study is the characteristic (hedonic) feeder cattle pricing model. Feeder cattle price is determined by a combination of cattle and lot characteristics, and market forces (see Table 1 for a description of variables used in the study).

$$P = f\{Hd, Wt, Future, Sex, SV, Corn, Year\}, (1)$$

Table 1. Variables and their definitions used in the empirical model.

Variable	Definition	Measurement
P	Price of feeder cattle	($/cwt.)
Hd	Number of cattle in lot	Actual number
Wt	Weight of cattle in pounds	Actual weight 300–974 lbs.
Future	Closing feeder cattle futures price on day of sale	$/hundredweight
Sex	Sex of feeder cattle	1 for Steers; 0 for Heifers
SV	Source Verified	1 if SV; 0 if non SV
Corn	Spot price of corn	$/bushel
D1	Dummy variable for 1998	1 for 1998; 0 otherwise
D2	Dummy variable for 1999	1 for 1999; 0 otherwise
D3	Dummy variable for 2000	1 for 2000; 0 otherwise

The variable Hd is expected to capture the effect of pooling. Larger groups are expected to receive a higher price. Weight of feeder cattle is known to have an inverse relationship to price. Feeder cattle futures prices capture overall market conditions. Corn prices are inversely related to feeder cattle prices as they directly impact the profit potential, and therefore, demand by the buyer. The final variable is to measure the effect of the special IMBIO source-verified sale. After accounting for all the other variables listed, is there a premium for feeder cattle sold through the IMBIO sale?

Separate regressions were run for the complete data, SV and non-SV data, and for the different months in which the sales occurred (October, November, and December) in each of the four years 1997–2000. Additionally, feeder cattle were separated into two weight classes, and different regressions were run for them as well. Steers were separated into groups of less than or equal to 650 lbs. and those over 650 lbs. For heifers, the dividing weight was 600 lbs. Results are shown in Table 2.

Results and Discussion

The proposed models performed reasonably well. The R-square values suggest that the models explained most of the variation in prices. With few exceptions, the variables had the expected sign and were significant.

Table 2 lists the coefficient and t-value estimates for the variables specified in Table 1 using eight regression models. Source verification and pooling generated price premiums in all models examined in the study. The premium value was sensitive to month of the sale, ranging from $1.02 in October to $2.38 in December. Furthermore, the SV premium appeared to be larger for lighter-weight cattle. The estimated premium for steers and heifers weighing less than 600 lbs. and 650 lbs., respectively, was $1.84. The SV premium for the heavier group of cattle was $0.44, a statistically insignificant value. The SV premium estimated in the combined model was $1.25/cwt. The SV premiums estimated in this study were less than those suggested in other studies when accounting for other variables that influence price.

SV sales typically featured larger lots, and the pooling effect also generated price premiums. Pooling feeder cattle into large-sized lots generally increased prices $0.03–$0.06/cwt. for each head added.

Source verification of cattle offered with all background information and documentation helps the potential buyer to determine the value of the calves. Buyers are offering premiums for the quality they expect, for background information, and for confidence in the reliability of the information presented about the feeder animals. Because the quality cannot be determined solely by inspection, the issue of reputation of the market and the sellers does influence the buyers. However, in this study, SV was a newly introduced, innovative approach to feeder cattle management and marketing. The reputation of the sellers cannot be established because cattle from several sellers are pooled into a single lot. The emphasis of reputation is shifted to the auction market operator who is responsible for sorting the cattle and enforcing SV standards. However, when combining lot size and SV, premiums are comparable to these earlier studies. For example, steer calves in a pooled lot of 90 head at the IMBIO SV sale received $6.30/cwt. more than those in a 10 head lot in a regular sale in 1997.

Implications

The IMBIO feeder cattle program of pooling source-verified calves into large uniform lots resulted in higher selling prices compared with regular feeder cattle auction market prices. After accounting for market conditions, sex, and average weight, source verification and large lot size produced by the IMBIO program resulted in statistically higher selling prices. The value of an additional animal in a lot increased at a decreasing rate, and source verification added $0.44 to $2.38/cwt., depending on the weight class and month in which the sale occurred. For example, a pooled group of 90 head of 550 lb. steers received $6.30/cwt. ($34.65/head) more in the 1997 IMBIO sale than 10 head of similar steers in a non-IMBIO sale during the same year in the same auction market, all else being equal.

Table 2. Estimated premiums and discounts ($/cwt) associated with feeder cattle and market characteristics for fall 1997, 1998, 1999, and 2000 in Bloomfield Auction Market—parameter estimates (t-values).

Independent variables	Combined	Traditional	IMBIO SV	≤ 600/650 heifer/steer	>600/650 heifer/steer	October	November	December
Model	**M1**	**M2**	**M3**	**M4**	**M5**	**M6**	**M7**	**M8**
Intercept	110.90	110.89	111.11	112.20	87.53	245.47	72.86	86.22
	(17.28)	(16.90)	(8.34)	(20.56)	(10.31)	(6.62)	(5.30)	(6.17)
Head	0.029	0.036	0.017	0.028	0.034	0.037	0.019	0.057
	(10.36)	(10.26)	(2.95)	(6.84)	(9.45)	(8.28)	(5.09)	(5.42)
Weight	-0.036	-0.035	-0.054	-0.053	-0.022	-0.037	-0.037	-0.043
	(-64.57)	(-60.31)	(-29.98)	(-57.36)	(-19.83)	(-37.64)	(-45.31)	(-37.25)
Futures	0.432	0.427	0.315	0.475	0.306	-1.252	0.690	0.921
	(4.86)	(4.76)	(1.35)	(6.25)	(2.77)	(-2.61)	(5.33)	(4.58)
Sex	5.46	5.37	7.98	7.84	3.60	6.65	4.93	7.38
	(46.64)	(44.18)	(19.07)	(51.92)	(19.34)	(29.02)	(32.53)	(27.56)
SV	1.25			1.84	0.44	1.02	2.02	2.38
	(3.42)			(5.36)	(1.00)	(1.59)	(3.55)	(4.23)
Corn	-19.14	-19.23	-11.39	-18.27	-9.29	-19.68	-12.05	-24.30
	(-11.51)	(-11.82)	(-1.90)	(-14.01)	(-3.21)	(-8.46)	(-2.93)	(-3.50)
D1	-14.91	-14.95	-12.15	-14.00	-10.93	-31.46	-7.23	-12.00
	(-14.98)	(-14.97)	(-4.41)	(-17.54)	(-6.67)	(-8.20)	(-2.85)	(-4.00)
D2	-8.12	-8.39	-0.43	-7.63	-1.80	-8.24	-1.64	-13.69
	(-4.94)	(-5.20)	(-0.07)	(-5.85)	(-0.65)	(-3.04)	(-0.47)	(-2.19)
D3	-1.45	-1.48	5.43	-0.18	3.38	10.06	2.04	-11.39
	(-0.81)	(-0.84)	(0.86)	(-0.12)	(1.21)	(2.02)	(0.63)	(-1.81)
R-square	0.95	0.95	0.94	0.94	0.94	0.95	0.95	0.92