Valuing Double Vaccination in Feeder Cattle

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Introduction

Pre-conditioning is a calf management program that grew out of a concept that originated in Iowa in 1965. The program is designed to reduce risk, health problems and improve profitability for both cow-calf producers and cattle feeders. Dr. John Herrick, Extension Veterinarian at the ISU College of Veterinary Medicine, and Dr. Harold Amstutz of the American Association of Bovine Practitioners were instrumental in developing the pre-conditioning program and coordinating the delivery of the program with Cliff Iverson, Area Extension Livestock Specialist, and co-workers in southeast Iowa. Today, Iowa leads the nation in the size and scope of this program.

For the past six years, the Northwest Iowa Pre-Conditioned Sale Committee, Iowa Cattlemen's Association and Iowa Veterinary Medical Association (IVMA) have co-sponsored a series of pre-conditioned feeder cattle sales at Sheldon Livestock Sales, Inc. The program has been successful in adding value to feeder cattle compared with calves that are not pre-conditioned.

In the fall of 2003, the Northwest Iowa Pre-Conditioned Sale Committee, Iowa Veterinary Medical Association and Iowa Cattlemen's Association addressed the need for an alternative health protocol, in addition to the original green tag program. Local feedlot buyers were asking for changes in the health program, and a double-tagged program was designed to address this need. The Iowa Beef Center analyzed the sale data to determine value differences between traditional green-tag and double-tagged feeder calves.

Materials and Methods

Three pre-conditioned sales (December 20, 2003; January 10, 2004; and February 7, 2004) offered cow-calf producers the opportunity to sell traditional green-tag calves or double-tagged calves. A total of 109 cow-calf producers consigned 3617 head of cattle. Thirty-one consignors offered 1071 head of double-tagged calves.

The requirements of the traditional green-tag program are determined by a joint effort of the IVMA and the Iowa Cattlemen's Association. A traditional green-tag calf enters the feedlot after having been weaned for 30 days, bunk adjusted and vaccinated at least once for the major infectious diseases (IBR, PI-3, BVD, BRSV, 7-way Clostridial and Haemophilus Somnus), treated for external parasites, and castrated and de-horned if necessary. Once these procedures are completed by a veterinarian, a green

tag is clamped in the upper portion of the calf's left ear. Green tags are issued to veterinarians by the Iowa Veterinary Medical Association (IVMA), and each tag carries an identification number. The second step in the traditional green-tag program is the IVMA Pre-Conditioning Certificate. This certificate, official only if signed by the attending veterinarian, is not issued until all calves listed in the certificate by the green tag number have been weaned at least 30 days. Another requirement is that the calves must be owned at least 60 days by the person whose signature appears on the certificate.

The double-tagged protocol requires the mandatory green-tag procedures of vaccinations, castration, de-horning, 30-day weaning and 60-day ownership. However, additional procedures are required. Two modified-live vaccinations must be administered for the 4-way viral, 7-way Clostridial, and Haemophilus Somnus. The second vaccination is required a minimum of one week prior to sale. One vaccination for Pastuerella (killed or MLV) is required. Internal parasite treatment is also required. When all of the requirements for the double-tagged protocol are met, the attending veterinarian will clamp a green tag and a silver regulatory tag in the calf's ear. The number sequence of the silver regulatory tags is listed on the original pre-conditioning certificate and "Double-Tagged Program" is to be written on the top of the certificate.

Data and Model

The data include 433 lots of feeder-cattle (3532 head) sold on three days in the Sheldon, Iowa auction market. The data were collected by a USDA certified market reporter and Beth Doran, ISU Extension Beef Field Specialist. The analysis predicts how sex, color, frame score, lot size, cleanliness (dirt and manure tags) of the animals and day of sale affect the price ($/cwt) of feeder-cattle in the auctions. It also evaluates if buyers are willing to pay more for cattle that are double-tagged, implanted, or treated for parasites. There are added expenses for the sellers that may or may not be valued by the buyer. The following variables were identified:

TwoTags - takes the value 1 if the calves were double-tagged and 0 otherwise.
Sold 1st Day - means that the lot was sold on December 20, 2003.
Sold 2nd Day - means that the lot was sold on January 10, 2004.
Sold 3rd Day - means that the lot was sold on February 7, 2004.
Manure Tag - makes reference to animals that have manure deposition in the hair and indicates lack of cleanliness in the pen.

Frame Score - is a measurement of the size of the animal where 1 means small, 2 means medium and 3 means large scale.
Parasite Treated - takes the value 1 if the lot received any kind of parasite treatment before going to the auction and 0 otherwise.
Lot Size - is the number of cattle in the sale lot.
Implant - takes the value 1 if the lot received any kind of growth promoting implant before going to the auction and takes the value 0 otherwise.
Male - takes the value 1 if the lot is comprised of steers and 0 if it is comprised of heifers.
Black - takes the value 1 if the lot is comprised of mainly black animals and 0 otherwise.
Dirty - takes the value 1 if the animals in the lot are dirty and 0 otherwise.
Average Weight - is the average weight of the animals of the lot in lbs/head.

A generalized linear regression was run to determine the effects of these characteristics in the lot price. The final equation for the regression is:

Lot price ($/cwt) = β_1 Intercept + β_2 TwoTags + β_3 Sold1stDay + β_4 Sold2ndDay + β_5 LotSize + β_6 Male + β_7 AverageWeight + β_8 FrameScore + β_9 Black + β_{10} Implanted + β_{11} ParasiteTreated + β_{12} Dirty + β_{13} ManureTags

Results

The results of the regression are shown in Table 1, the R^2-statistic for the regression is 0.87 which is quite good indicating that the variables predict much of the variation in the average price.

The most important variable determining the price of the animal was its lot average weight. Heavier animals received lower prices. An incremental increase of 100 pounds in the average lot weight causes an $8/cwt decrease in sale price.

The second most important factor affecting sale price was the sale day. Animals sold in the third sale received $14.22/cwt less than animals sold in the first sale and $9.93/cwt less than animals sold in the second sale. The day of sale reflects market conditions, such as fed cattle and corn prices.

The third most important variable was sex. Steers received $7/cwt more than heifers. This is because steers tend to have greater average daily gains and improved feed efficiencies compared with heifers.

Manure tags were the fourth most important variable. Animals with manure tags sold for $6.52/cwt less than animals without manure tags.

Frame score and hide color were much less important in determining the price of the animal. Black animals received $1.91/cwt more than non-black animals. Medium-frame animals sold for $1.30/cwt more than smaller animals, but less than large-frame ones.

Variables that result in price premiums (with 90% confidence) include: steers, frame score, black hide and day of sale. Prices are discounted on heavier weight and manure tags. Two tags did receive a premium of $2.25/cwt and was significant at the 90% level.

Lot size and the presence of dirty animals in the lot did not impact prices. Use of a growth promoting implant or parasite treatment did not impact prices.

Table 1: Linear regression results with feeder-cattle auction price as dependent variable

	Beta* Coefficients	Standard Error	t-statistic	P-value
Intercept	131.66	2.05	64.32	0.00
Two Tags	2.25	1.34	1.68	0.09
Sold 1st Day	14.22	0.67	21.10	0.00
Sold 2nd Day	9.93	0.60	16.56	0.00
# Head	0.05	0.04	1.44	0.15
Male	7.00	0.46	15.23	0.00
Average Weight	-0.08	0.00	-42.86	0.00
Frame Score	1.27	0.60	2.12	0.03
Black Hide	1.91	0.54	3.51	0.00
Implant	-0.37	0.46	-0.80	0.43
Parasite Treated	2.13	1.31	1.63	0.10
Dirty	-0.88	0.90	-0.97	0.33
Manure tags	-6.52	1.84	-3.54	0.00

* The beta coefficients are in $/cwt.

Conclusions

Although the heifers are more likely to receive *Certified Angus Beef*[®] (CAB[®]) premiums at processing plants (Busby et. al., 2004), steers sold for $7/cwt more at the feeder cattle auction. This difference in value may be attributed to increased rates of gain and improved feed efficiencies that would reduce feedlot costs for feeding steers.

Lots of animals with manure tags were paid less. Buyers appreciate cleanliness because it is considered as an indication of how well does the feeder-cattle producer cares his animals and therefore of the likelihood that the animals received proper care and health treatment.

Black animals received a small premium. This is because currently there are more grid marketing systems available for black-hided animals.

The day of auction had a large impact on price. It captures market conditions, such as corn and cattle prices. Market volatility due to BSE may have exaggerated this factor.

Although the premium was not as great in magnitude, double-tagged calves did sell for $2.25/cwt ($13.50/head on a 600 pound calf) more than calves that had been traditionally green-tagged. This variable was significant at the 90% confidence level.

References

Busby, W. D., Strohbehn, D. R., Beedle, P.,and L.R. Corah 2004. "Effect of Postweaning Health on Feedlot Performance and Quality Grade" Iowa State University Animal Industry Report 2004 Beef A.S. Leaflet R1885. http://www.iowabeefcenter.org/pdfs/BRR/R1885.pdf
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