Factors Affecting Feeder Cattle Prices in Internet Sales

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**Background and Motivation for Work**

**Stakeholder Needs**
- Management at Bluegrass Stockyards, LLC approached the author with questions about premiums for Age and Source Verification and Certified Natural.

**Traditional Feeder Cattle Pricing Factors**
- It has been readily accepted that corn and feeder cattle prices move opposite each other. However, anecdotal evidence suggests this may not always be the case (see chart below).
- Analysis of this relationship with recent data was requested.

**Uniqueness of Internet Sales Data**
- The uncertainty with respect to weight and other factors in internet sales provided an opportunity to estimate how price slides, shrink, and other factors impact feeder cattle prices.

**Sources of Data**

**Bluegrass Stockyards – data file and sale catalogs**
- Electronic data files were made available by Bluegrass Stockyards, LLC – lot size, pay weight, final price
- Sale catalogs – electronic files were supplemented by manual data entry from paper sale catalogs – base weight, cattle type, price slide, shrink, location, etc.

**Livestock Marketing Information Center**
- Feeder cattle, live cattle and corn futures – data drawn from CME Group
- Estimated slaughter weight and average daily gain – database from KSU Focus on Feedlots Survey

**Energy Information Administration**
- Weekly historical diesel fuel prices

**Methodology**
- A hedonic model was employed to evaluate the relationship between pricing factors and actual feeder cattle prices.
- Hedonic models are often used in the literature to estimate price impacts of feeder cattle traits and fundamental factors (Lawrence and Yeboah, 2002, Bulat and Lawrence, 2007, Shultz et al., 2010)
- Due to the presence of heteroskedasticity and autocorrelation, the following model was estimated using a robust estimator in SAS:

\[
\text{Bid price} = B_0 + B_1 \text{lot size} + B_2 \text{lot size}^2 + B_3 \text{base weight} + B_4 \text{live futures} + B_5 \text{corn futures} + B_6 \text{live price} + B_7 \text{heifer} + V_8 \text{month} + V_9 \text{location} + B_{10} \text{mileweigh} + B_{11} \text{implant} + B_{12} \text{PVP} + B_{13} \text{Nat} + B_{14} \text{PVxTime}.
\]

Where lot size refers to the number of head offered in the sale lot, base weight refers to the advertised weight in the sale catalog, live futures refers to the relevant live cattle futures price, corn futures refers to the nearby corn futures price, diesel price is the price of diesel fuel for that week, heifer is a binomial variable for heifers, month is a series of binomial variables for each month excluding January, location is a series of binomial variables for each state in which cattle originated except Tennessee, mileweigh is the price slide on the first 50 lbs above the base weight, implant is a binomial variable for cattle that have been implanted, PVxTime is an interaction term between PVP and time, and time is a continuous variable accounting for days from the first internet sale in the dataset.

**Previous Work / Literature Review**

**Premiums for Age and Source Verification**
- Surprisingly little work has been published on price benefits of age and source verification
- A 2007 Montana Study found a price benefit of less than $13 per head for age and source verification
- A 2007 Kansas Study found a price benefit of more than $13 per head for age and source verification

**Key Findings and Implications**
- Moderate premiums found for age and source verification and natural - $11 per head for age and source, $17 per head for natural, $32 per head for both
- Negative relationship between corn price and feeder cattle price found during a volatile period
- Some evidence to suggest a smaller magnitude than past work – heavier average weight of feeder cattle (800 lbs) and much higher average corn price ($4.56)
- Incentive to underestimate weight (Brorsen et al., 2001) did not exist
- Incentive to overstate weight (Brorsen et al., 2001) did exist
- Actual price slide of $9.025 per cwt compared to typical offered slide of $4 per cwt suggests cattle bring more when base weight = actual weight

**Selected Resources**