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## **Observations from Mandatory Livestock Price Reporting for Analysts and Researchers**

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## **Observations from Mandatory Livestock Price Reporting for Analysts and Researchers**

*Mandatory livestock price reporting has changed how prices are reported and used. Reporting has affected the availability of many reports and has added new reports and information. A variety of research issues are facilitated by the scope of new information available. However, the new information often needs to be put into a meaningful form for direct use. A brief overview of the evolution and implementation of mandatory price reporting is given. The new price reports are then discussed and compared to voluntary reports. There is enough new information that analysts may be able to make different insights into price formation. Special attention is given to new reports that give insights into the short-run cattle supply situation. While the focus is on cattle reports, swine reports are also briefly discussed.*

As fundamental business practices have changed in the beef industry in recent years, price transparency has come into question. Changing business practices imply different price information may also be necessary for market participants to make informed business decisions. Before mandatory reporting, producers argued they were not able to quickly and easily obtain information to determine the best possible price for their product. State legislatures responded by passing mandatory reporting laws, requiring packers sourcing livestock in the respective states to make more market information accessible.

Passage of the Livestock Mandatory Reporting Act of 1999 usurped various regulations requiring packers to report transactions to state authorities. Under the national law, large packers of cattle, swine, and sheep must report data from purchases and processing with respect to price, volume, and grade. The U.S. Department of Agriculture's Agricultural Marketing Service (AMS) is responsible for assembling and disseminating the reports.

The relevancy of information provided under national mandatory price reporting has not been assessed at this time. There has been adoption of different prices, for example by the Chicago Mercantile Exchange. However, methods of disseminating the abundance of new information in an understandable manner need to be examined. With any new information

system there is also a concern over its internal consistency. Quite simply, will the numbers add up in a meaningful way and be reliable enough to improve decision-making? Following the initial implementation, there have been changes in what and how information is delivered. There is now a brief data history available, making comparisons to year ago levels possible.

The purpose of this paper is to distill the information available under national mandatory livestock price reporting. The focus will be primarily on cattle prices, with some comparisons to swine reporting. An overview of the current breadth of reports follows with particular attention given to formula and forward contract prices. The committed and delivered and packer owned reports are then covered in detail as they provide a significant amount of new, non-price information that should be useful for gauging short- and medium-term supply situations. The paper concludes with implications for analysts and researchers working in this area.

## **Background**

Fundamental changes in the beef industry are: a concentration of buyers and sellers of finished livestock, an increased number of alliances, a lessened reliance on cash markets (specifically auction markets), a shortened trading window for slaughter transactions, and an increased use of value-based pricing (GIPSA, 2001). The result of these changes has been a reduced number of transactions covered by traditional voluntary price reporting. While reduced transparency does not have to imply reduced pricing efficiency, it does call into question the timeliness and applicability of reported prices.

Haley (2001) provides a brief overview of the legislation and early implementation problems of mandatory price reporting. One such problem was a meat price reporting error that potentially distorted cattle prices (LMPR Review Team, 2001). A possible contributing factor

identified as a cause of the problem was the “3/60” guideline, implemented to ensure that confidentiality was maintained, that limited a broad scope of prices from being reported. Analysts may have been able to catch the reporting error sooner with a full array of prices. AMS now uses a “3/70/20” guideline, for details see Haley (2001), and there is now much broader reporting.

The national law has resulted in the loss of some state-level market information. National reporting eliminated many state-specific reports released by AMS. For many states not included in the current regional or state-specific reports, uncertainty now exists as to the relevant price for decision-making, even when they have auction markets. Auction summaries and direct feeder cattle reports were unaffected by the switch to mandatory reporting. Cattle feeders, packers, and the rest of the industry used these reports for decision-making and had to look to other sources for bid and ask information, which led to some concerns about the unbiased nature of the sources. AMS recently resumed voluntary reporting of prices on a limited basis, but not for any of the areas that lost direct reports.

Schroeder et al. (2002) find similar sentiments about the performance of mandatory reporting in a survey of cattle feeders. The perception was neutral to negative regarding the net benefits of having mandatory reporting. Of particular note are the results that reporting is now considered less timely and that no additional price information is available. Further, feeders sensed no increase in their ability to negotiate with packers. While this should not be viewed as a condemning feature of the legislation, it captures the frustration in negotiating prices in the current environment.

Wachenheim and DeVuyst (2001) assess the potential for collusive packer behavior under national mandatory price reporting. They present multiple arguments both for and against

the likelihood of collusion, with the level of aggregation in the reported data as the most significant factor. Similarly, Azzam (2003) develops a model that combines price information across packers and finds that mandatory reporting may reduce the cost of price uncertainty. The potential result is a reduced cost for packers and potentially an increase in demand for cattle.

## **Price Information**

The switch from voluntary to mandatory reporting has had direct and indirect consequences on price information. While only a portion of the reports are highlighted here, a list of all reports under mandatory price reporting can be accessed at the AMS website, [www.ams.usda.gov](http://www.ams.usda.gov). AMS and the industry use inconsistent naming conventions for various reports. Thus when clarity is necessary the number of specific reports, such as LM\_CT154, will be given.

For slaughter cattle prices at the national level, AMS reports information monthly, weekly, and multiple times daily. Direct slaughter cattle purchases by packers are broken down into negotiated, formulated, and forward contract reports. Regional prices are available for Texas-Oklahoma, Kansas, Nebraska, Colorado, and Iowa-Minnesota to varying degrees. These states comprise the 5-Area reports. Cow and bull price reports are available at the national level. A weekly report of premiums and discounts rounds out the price reports.

The negotiated purchases report, LM\_CT154, covers slaughtered animals that were purchased using a negotiated price. Included is the number of head, dressing percentage, weight range, weighted average weight, price range and a weighted average price. A new feature is the additional breakdown of non-negotiated purchases, such as in LM\_CT151. Thus, prices in these

reports may allow for a reasonable comparison of the prices paid for negotiated versus formulated cattle of similar quality sold at similar times.

The negotiated weighted average price can be compared to similar classes of slaughter animals purchased on a formulated or forward contract basis. Comparisons of weekly purchased cattle are shown for the second half of 2002, using weighted average prices for domestic 35-65% Choice steers bought on a live-weight basis (figure 1). Included are a negotiated price from LM\_CT154 and formulated and forward contract prices from LM\_CT151. The prices are those paid for cattle slaughtered during the week reported. As such, there is a timing issue when comparing the prices, particularly for forward contract purchases. Packers paid a relatively high price for forward contract cattle as futures tended to trade high relative to expiration during much of the time period. The formula prices lag the negotiated prices, which is understandable if the formulas tie to observed cash prices. There seem to be relatively large swings in the forward contract prices, perhaps because of thinness in this market segment.

Two issues are apparent given the price information available. First, it may be possible to extend the work of Ward, Koontz, and Schroeder (1998). With a long and growing time-series of negotiated and formula prices, it would be possible to at least account for seasonal patterns and large market shifts. The second issue is that of packer margins. It is not clear what final price, across all purchases, packers are paying over time. As long as cost is obscured, feeders will not know the margin on which to negotiate. The cost is probably more of an issue for swine, but more transparent also.

A useful and informative swine report was not released consistently until after the “3/60” guideline change. The prior day slaughtered swine report gives final prices paid for swine under the different purchase arrangements. Reported are the daily head count and average net price for

the following purchasing categories: negotiated, other market formula, swine or pork market formula, other purchase arrangement, and packer sold. A head count and slaughter characteristics are given for packer owned hogs, but a price is not applicable for the category. A total weighted average price is also given for the categories where producers sell to packers. This price is probably the most transparent indicator of packer costs.

### **Supply Situation**

AMS reports supply information that was not available before mandatory reporting. The committed and delivered cattle reports give summaries of cattle classified by purchase type and by cattle type (steer, heifer, etc.). Specifically, cattle to be delivered within the next seven days are considered committed. If a large amount of cattle were reported as committed for a particular day, then one would know that these cattle would be delivered sometime in the next week. This gives an indication of the short-run supply conditions relevant for price discovery and efficient planning or timing of feedlot sales.

Looking at the total number committed and delivered clarifies daily patterns of purchasing behavior in the industry. Packers purchase a large number of cattle on a given day of the week, then take delivery of a smoothed out number of head on a daily basis. There are typically spikes in the daily committed level and little variability in the daily delivered level (figure 2). Because of the difficulty of pinpointing specific cattle committed to the exact day they are delivered, running totals are necessary to see how committed and delivered levels correspond to each other.

Because AMS reports say committed cattle are “generally for slaughter in 7 days”, a five-calendar-day tally is used to give a running total of committed and delivered cattle. The 5-day



delivered total would roughly equal a moving total of weekly slaughter (figure 2). The 5-day committed total indicates whether or not packers are “short bought”, meaning that a small 5-day committed total implies packers need cattle to maintain slaughter plant efficiency and may be willing to pay higher prices to achieve such efficiency. Such times would show as valleys where the 5-day committed total is below the 5-day delivered total (figure 2). AMS currently reports week-to-date totals in a morning review report, LM\_CT130.

For comparison purposes, consider another aspect of the swine slaughtered report - the number of swine scheduled for delivery to packing plants. Each day the number scheduled for the following two weeks is reported. The average number of head scheduled declines as one looks ahead through the week. The information should allow producers to gauge the short-run supply situation of packers. If packers are “short-bought” they may be more likely to bid up cash purchases. If packers have a relatively large number of hogs already arranged for slaughter, they may offer lower bids.

To demonstrate how to use the information, the number of head scheduled for delivery during the next two weeks was computed on Fridays during the first quarter of 2003 (figure 3). The number scheduled each week is compared to the number scheduled from a year earlier. During the first six weeks of 2003 packers had more swine scheduled than during 2002, i.e., they had ample supplies ready for slaughter. One would not have expected sharp increases in cash prices following those weeks. Had the levels been below the 2002 amounts, producers could have used the information and waited for improved bids.

Returning to the cattle reports, another piece of data that may be useful is the breakdown of the committed and delivered cattle from each state. Such a breakdown might prove insightful

for modeling temporal and spatial movements of cattle. Knowing the source of marketings may improve projections of cattle-on-feed statistics, similar to Norwood and Schroeder (2000).

The weekly packer owned cattle report, LM\_CT153, has slaughter volume and characteristics for cattle owned by packers, but no prices. It also gives slaughter volume for cattle slaughtered that were purchased the previous week under formulas and forward contracts. In addition, it gives forward contract data by month that includes a head count and the observed range of basis levels. AMS has refined this report by adding the year of the contract month and a cumulative total contracted for each month. The forward contract volume data itself is not new. AMS used to report a running total of contracted volume in the “Forward Contract Slaughter Cattle” report. By gathering the amount and month of cattle forward contracted it would be possible to gauge medium-run supply conditions.

Using the weekly average closing of the CME futures price with the reported basis levels, it may be possible to infer the forward contract price at the time the contracts were entered. Such prices could be matched against the eventual forward contract prices paid. Admittedly, the low volume of head forward contracted may limit the usefulness of such information. However, producers have conveyed that they have felt pressured to forward contract at different times of the year to capture good price levels that erode as soon as packers get enough cattle purchased. Commenting on the recent introduction of serial contracts, Diersen (2003) notes the new contracts should reduce basis risk associated with hedging, but will have an uncertain impact on forward contracting activity. The basis bids and contracting volume observed in LM\_CT153 should allow insights into these issues and extend efforts such as those of Elam (1992) and Parcell, Schroeder, and Dhuyvetter (2000).

## **Captive Supply Considerations**

A political controversy indirectly related to mandatory price reporting is the effort to ban packer ownership of livestock, tied most recently to the 2002 farm bill. A key issue is whether packers should be allowed to own livestock for more than 14 days before processing. A controversy surrounding the bill was the issue of “control” (Fuez et al., 2002), where various contracting arrangements could have been termed “ownership”. National reporting provides some information concerning the scope of packer ownership. A closely related issue is captive supplies of cattle. The U.S. Department of Agriculture’s Grain Inspection, Packers, and Stockyards Administration (USDA-GIPSA) defines captive supply as cattle owned, fed, or procured more than 14 days prior to slaughter (GIPSA, 2002).

The packer owned cattle report provides a weekly breakdown of the number of head slaughtered that were owned outright by packers and priced through forward contracts or formulas. The weekly numbers were tallied for the first quarter of 2002 and compared with the total number of head of cattle slaughtered under federal inspection during the quarter from USDA-NASS (figure 4). Those cattle not counted in the packer owned report were classified as negotiated. Negotiated sales accounted for 61 percent of the number of head slaughtered. The next largest category was for formula purchased cattle at 32 percent. Packer owned slaughter was 4 percent and forward contract slaughter was 3 percent.

The packer owned percentage is consistent with the percentage of packer fed purchases GIPSA (2002) reports for recent years. In addition, national cattle captive supply has amounted to about 20 percent of slaughter in recent years (GIPSA, 2002). Neither category seems to be growing, but the latter are perhaps more relevant to watch from a market-efficiency standpoint.

South Dakota's mandatory price reporting law, which passed in 1999, applied to cattle, swine, and sheep purchased in the state (SDCL, 2000). South Dakota's Department of Agriculture collected prices during the enforcement period and made them available to the public. South Dakota mandatory live cattle prices were obtained from September of 1999 through March of 2001.

South Dakota livestock industry people have expressed concern about the common practice of 20-day contracts in South Dakota and the 14-day breakouts in national mandatory price reporting. The South Dakota mandatory reporting data shows two distinct windows in the delivery dates of the cattle. There were about 900,000 head of cattle in the South Dakota data set. Of those, about 400,000 head were cows, bulls, or missing a delivery date. Of the 500,000 head of slaughter steers and heifers, about 400,000 had a delivery date within 7 days of the purchase and about 100,000 head specified delivery within 20 days of purchase. The number of head under the 20-day window would be classified as captive supply, suggesting a situation in South Dakota similar to the national picture.

The 20-day forward contract delivery time seems like it may be of value to both the packer and the producer. The packer may desire the long window to assure an orderly supply for slaughter. As such, packers may be willing to pay a premium for such cattle. An at-the-money call option on a live cattle futures contract with 20 days until expiration and an implied volatility level of 10 percent would be valued at about \$0.70/cwt. That is, upside price protection would cost packers \$0.70/cwt. in the options market and they might be willing to pay up to that amount for 20-day forward contracts.

Similar reasoning applies to producers. By entering into the short-term contract a producer protects against any drop in price over the next 20 days, and a put option would be

valued at a similar amount. Empirically, it is too early to clearly decipher what might be happening. A preliminary comparison shows the average difference between the 20-day contract prices and cash prices is less than \$0.70.

## **Implications and Conclusions**

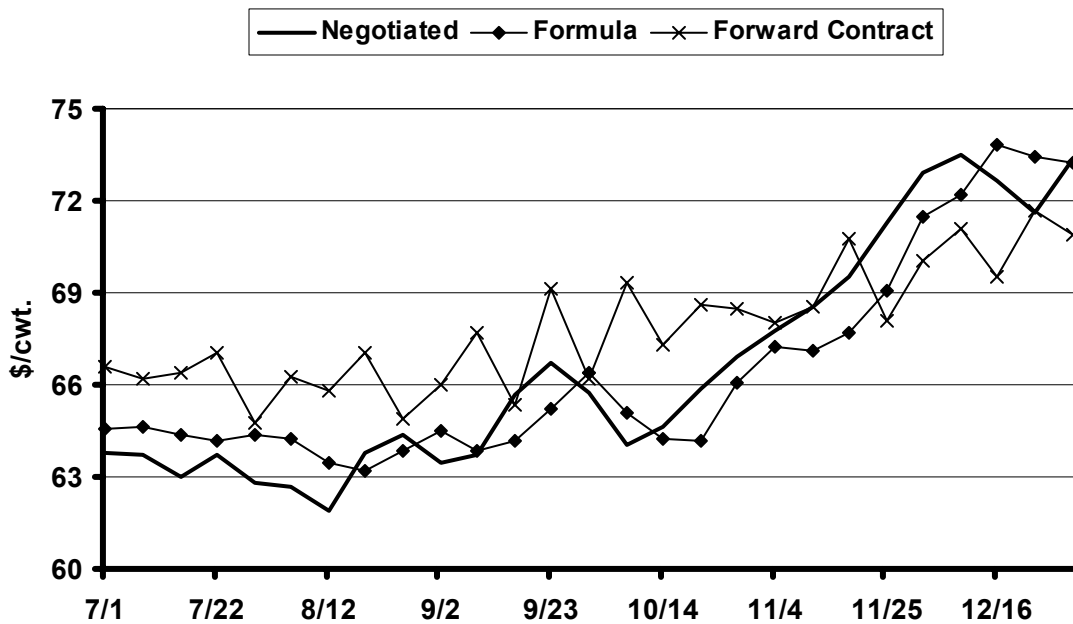
The livestock industry has seen mixed results from national mandatory price reporting. The information available surpasses the scope that was accessible to producers before national reporting. At least at the national level, a comparison of prices is possible across possible purchasing methods. The short-run supply situation is also more transparent.

A variety of issues related to mandatory reporting remain unresolved. Henderson (2003) has elucidated the concern of producers about accepting formula prices where the base price may be determined by potentially inferior cattle. National legislation introduced in recent months has again addressed packer ownership bans, a requirement of a negotiated base price in formula and forward contracted purchases, and that a minimum percent of the weekly slaughter volume be purchased on the spot market.

Packer ownership and captive supply can at least be observed and some of their real or perceived price impacts can be examined with the available data. The analysis lays the groundwork for similar insights for other states and suggests possible trends that may evolve at the national level once participants learn how reporting works. Finally, further analysis may suggest improvements that could be made to the price reporting laws at the national level. Given the limited life span of the national law, an assessment of its performance is relevant to pursue.

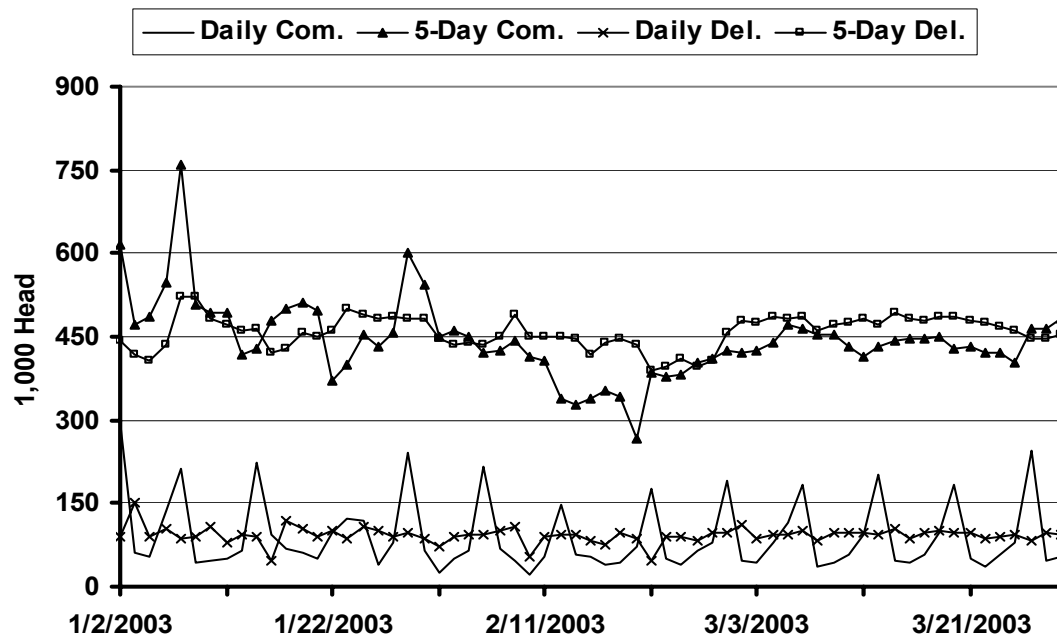
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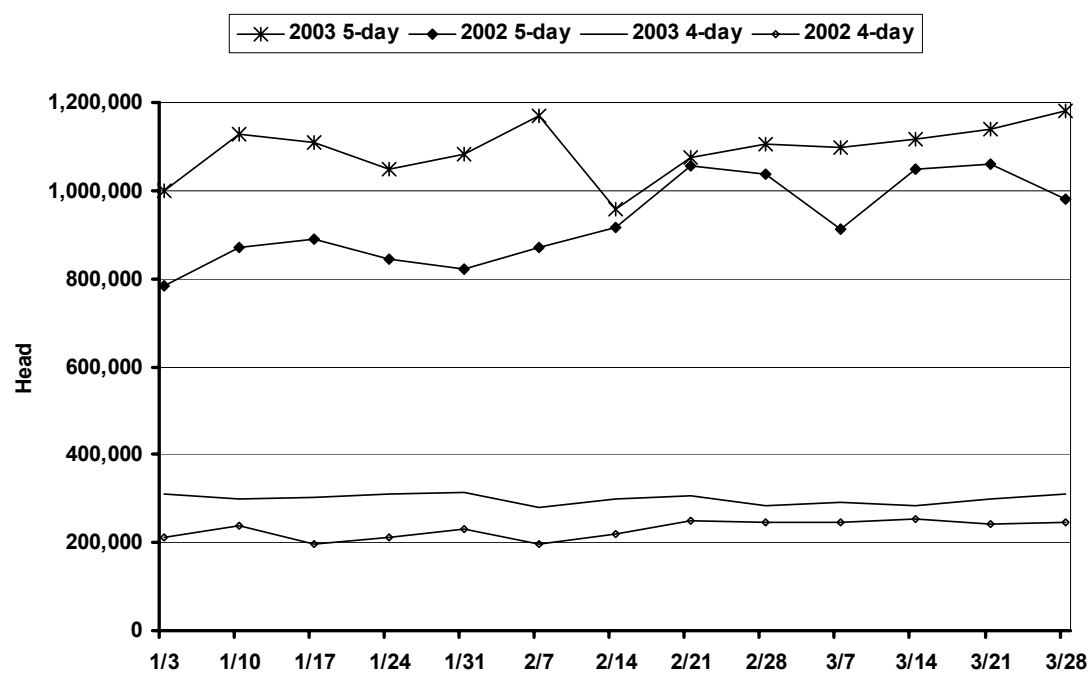
Source: AMS

**Figure 1. Weekly Live Slaughter Cattle Prices, July-December, 2002**



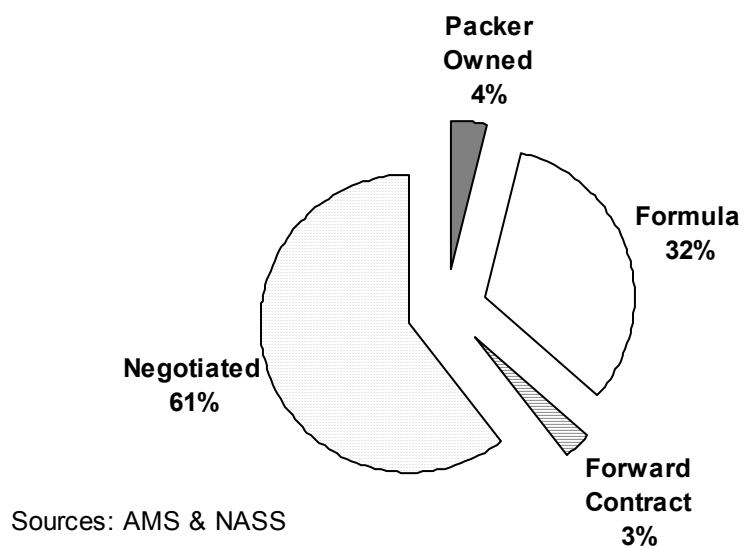
Source: AMS

**Figure 2. Committed and Delivered Volume Comparison, January-March, 2003**



Source: AMS

**Figure 3. Assessing Swine Scheduled for Delivery, January-March, 2003**



Sources: AMS & NASS

**Figure 4. Cattle Slaughter Breakdown, October-December, 2002**