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Abstract

Mandatory livestock price reporting has changed how prices are reported and used by analysts and market participants. Reporting has affected the availability of many reports and has added new reports and information. The new information often needs to be put into a meaningful form for direct use by analysts and participants. 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. Special attention is given to new reports that give insights into the the short- and medium-run cattle supply situation. As South Dakota had State-level reporting in place prior to the Federal law, there is additional data and insights that put national observations into perspective. While the focus is on cattle reports, swine reports are also briefly discussed.

Key words: captive supply, cattle prices, hog prices, transparancy

Gleaning Information From Mandatory Livestock Price Reporting

Price transparency refers to the level of openness of observed or available transactions. As fundamental business practices have changed in the beef industry in recent years, price transparency has come into question. Among the fundamental changes 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. 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 procuring 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 (USDA-AMS) is responsible for assembling and disseminating the reports.

The national law has resulted in the loss of some state-level market information and presented problems because of inaccurate and incomplete data. National reporting eliminated many state-specific reports released by USDA-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. Upon implementation, producers had to look to other sources for bid and ask information, which led to some concerns about the unbiased nature of the sources.

The relevancy of other information provided under national mandatory price reporting has not been assessed at this time. Methods of disseminating the abundance of new information in an understandable manner also need to be examined. With any new information system there is also a concern over the internal consistency of the whole system. Quite simply, will the numbers add up in a meaningful way and be reliable enough to improve decision-making?

The purpose of this paper is to discern the information available under national mandatory livestock price reporting. The focus will be primarily on cattle prices, with some comparisons to swine reporting. Lamb and meat prices will not be covered. The first aspect is the extent to which information may be lost because of discontinued reports. This is relevant for most states not covered by the 5-Area reports. The early reporting error will be covered next as its resolution affects many of the more meaningful reports. 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 implications from South Dakota's reporting data are discussed when they relate to or further explain what may be happening under national reporting. The swine reports are then briefly discussed followed by implications for market analysts, market participants, and policymakers.

Review of Literature

Haley (2001) provides a brief overview of the legislation and early implementation problems of mandatory price reporting. Because mandatory reporting is new and was quickly implemented, there has been limited research to draw upon except for studies that postulated what might happen under mandatory reporting. Koontz (1999) compared closeout prices to voluntarily reported prices. He found that feedlots and packers report prices to their advantage, suggesting that observed prices might not reflect changes occurring in the market. He also suggests that because the closeout prices are asymmetrically distributed, a median price would be more informative than a mean price.

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. Experimental economics offers evidence that the level of price information provided influences market efficiency (Anderson et al., 1998), and that more forward pricing is likely under mandatory reporting (Bastian, Koontz, and Menkhaus, 2001).

USDA-AMS has several new beef reports that replaced their voluntary national boxed beef cuts report. Shortly after implementation, a reporting error occurred when several reports incorrectly aggregated prices of meat cuts into composite and cutout values. Boxed beef prices were then understated and likely affected transaction prices for live cattle and any derivations such as futures prices. After the announcement of the error, the live and feeder cattle futures trade responded with sharp increases in prices.

The USDA oversaw an extensive review of the reporting error to determine the cause and any potential market impacts (LMPR Review Team, 2001). The relationship between the meat prices and live cattle prices was analyzed, but does not perhaps capture the true nature of the relationship. The mistake affected packer margins but who gained or lost is not readily evident. Following Owen, Sporleder, and Bessler (1991), meat and cattle prices are related, but it remains unclear how the relationship would be affected by the "drop" value and interactions of demand at the wholesale level. For a breakdown of the relationship between boxed beef and live cattle prices see Ward, Schroeder, and Feuz (2001). A possible contributing factor identified was the "3/60" guideline, implemented to ensure that confidentiality was maintained, that limited a broad scope of prices from being reported (LMPR Review Team, 2001). Analysts may have been able to catch the reporting error sooner with such prices. USDA-AMS now uses a "3/70/20" guideline, for details see Haley (2001), and there is now much broader reporting.

Discontinued Reports

The switch from voluntary to mandatory reporting has had direct and indirect consequences on price information. The scope of the problem is easily seen in that the

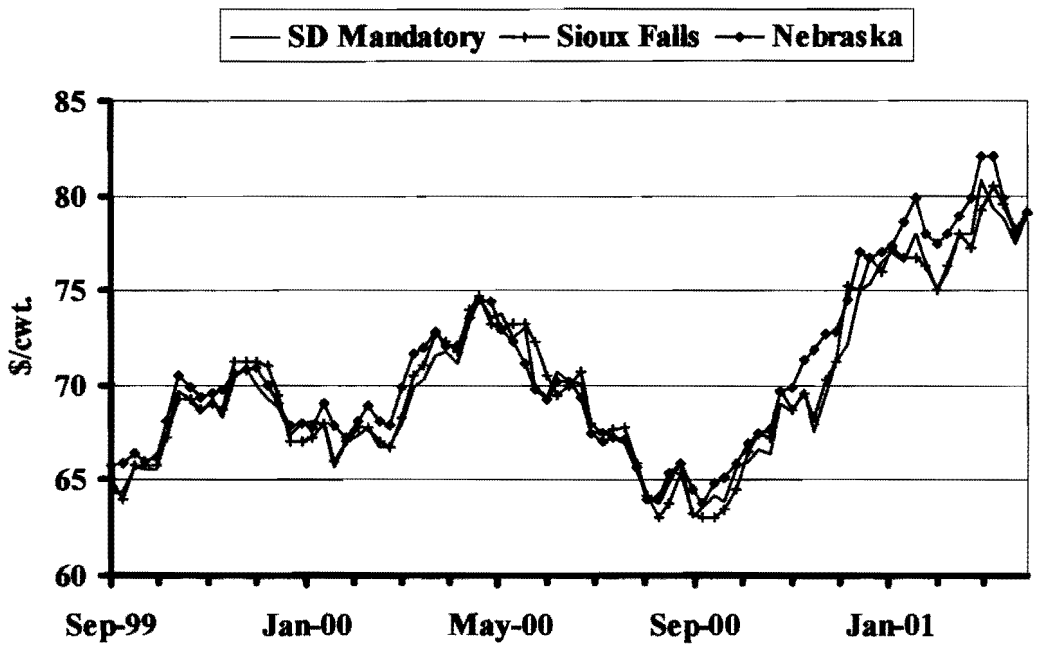
following reports are no longer available: Montana Direct, South Dakota Direct, California/Arizona/Nevada Direct, Indiana/Michigan/Ohio Direct, Illinois Direct, Wyoming/South Dakota/Nebraska Direct, and Washington/Oregon/Idaho Direct. Auction summaries and direct feeder cattle reports were unaffected by the switch to mandatory reporting. The auction summaries may now contain the best, if not only, reported prices of slaughter-weight cattle that can be specifically tied to many locations.

The discontinued South Dakota reports were related to slaughter-weight cattle. The "South Dakota Direct Slaughter Cattle" report was a daily summary of eastern South Dakota feedlot sales to packers. The "Wyoming, Western Nebraska, and Southwest South Dakota Feedlot Sales" report was similar to the first report, but covered a smaller region of South Dakota. Neither report resulted in both live and dressed quotes for all days, as trade was often sporadic for a given type. Regardless, cattle feeders, packers, and the rest of the industry used these reports for decision-making.

Given the loss of the price reporting specific to South Dakota, a concern exists about which currently available price best reflects the price received in South Dakota for slaughter animals. 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 stopped collecting mandatory data after the national law was implemented. A price series developed from the South Dakota data can be compared to other prices in an effort to determine which price, if any, can accurately reflect information in the discontinued reports. The knowledge obtained from the

analysis should give insights into similar problems facing other states that no longer have direct reports.

Two candidate prices for South Dakota are the Sioux Falls auction cash price and the new Nebraska cash price. South Dakota mandatory live cattle prices were obtained from September of 1999 through March of 2001. After sorting out slaughter steers and heifers purchased for delivery within 7 days, a weekly weighted average price series was developed. The S.D. mandatory price was then compared to the Sioux Falls price for Choice #2-4, 1100-1300# slaughter steers and the Nebraska Direct accumulated average live steer price (figure 1).



Sources: USDA-AMS, SD Dept. of Ag., & SDSU

Figure 1. Weekly Reported South Dakota Slaughter Cattle Prices

The prices track one another quite closely, although there was a stronger correlation between the S.D. mandatory price and the Sioux Falls price (.986) than for the

S.D. mandatory price and the Nebraska price (.979) on a weekly basis. While further analysis of this data is necessary to account for potential spurious correlation, the preliminary observation is that the Sioux Falls price more accurately reflects market conditions in South Dakota.

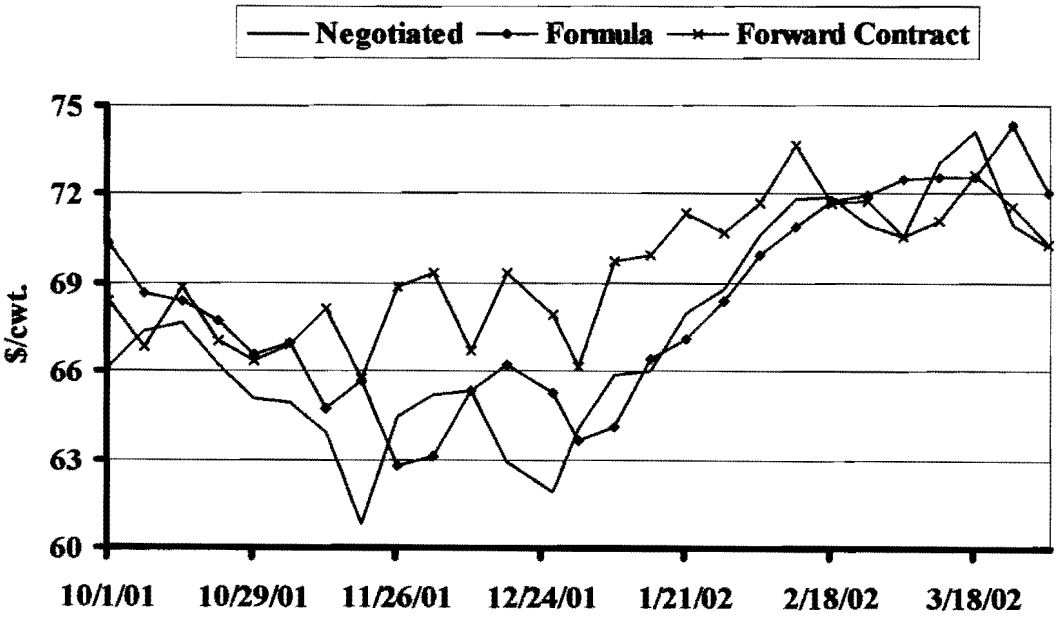
New Cattle Price Reports

While only a portion of the reports are highlighted here, a list of all reports under mandatory price reporting can be accessed at the USDA-AMS website, www.ams.usda.gov. For slaughter cattle prices at the national level, USDA-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 main difference in these new reports is the additional breakdown of the non-negotiated purchases. 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. For example, the "National Weekly Direct Slaughter Cattle – Negotiated Purchases" report gives information on 35-65% Choice steers purchased on a live basis. Included is the number of head, dressing percentage, weight range, weighted average weight, price range and weighted average price. The weighted average price can be compared to similar classes of slaughter animals purchased on a formulated or forward

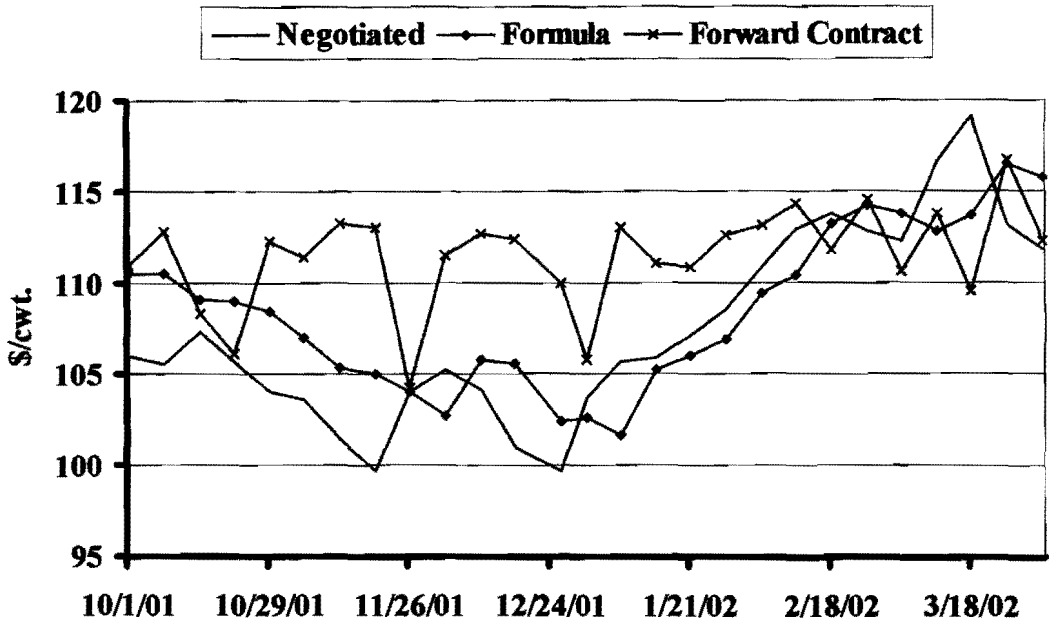
contract basis. For a discussion of common transactions involving formula prices see Ward, Feuz, and Schroeder (1998).

Comparisons of weekly purchased cattle are shown in figures 2 and 3 for the fourth quarter of 2001 and the first quarter of 2002. The weighted average price for domestic low-choice steers is shown in each figure and a similar pattern emerges for both live and dressed purchases. Unanticipated low prices in December of 2001 are reflected in negotiated prices observed below forward contract prices for the time period. The formula prices seem to 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.



Source: USDA-AMS

Figure 2. Weekly Live Slaughter Cattle Prices



Source: USDA-AMS

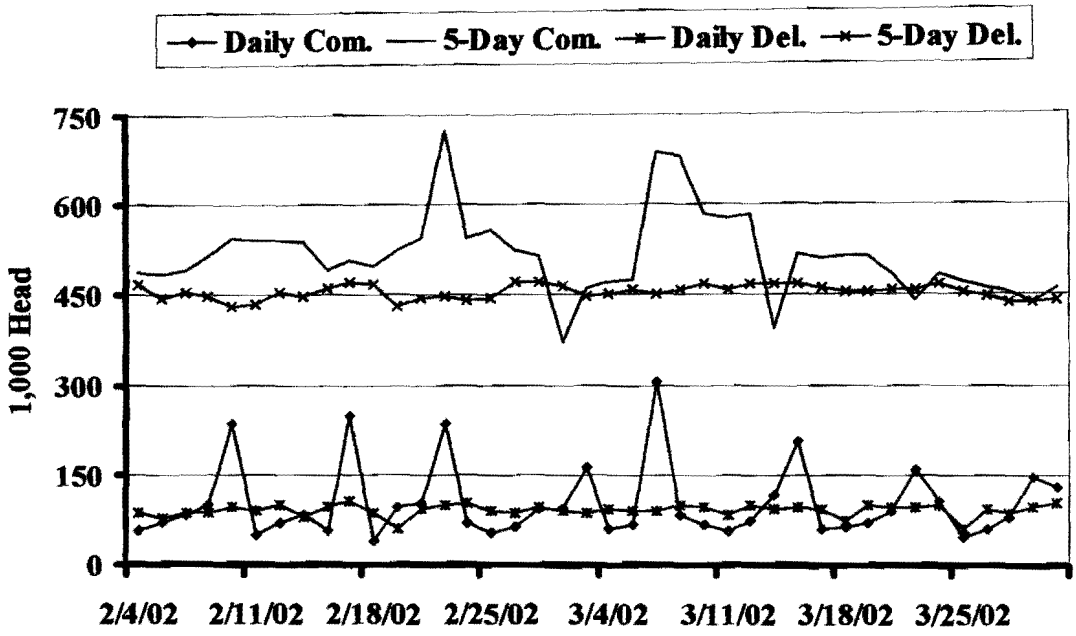
Figure 3. Weekly Dressed Slaughter Cattle Prices

Committed and Delivered Cattle Reports

USDA-AMS also reports additional 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 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. As shown in figure 4, there are typically spikes in the daily committed level and little variability in the daily delivered level. 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.



Sources: USDA-AMS & SDSU

Figure 4. Committed and Delivered Volume Comparison

Because USDA-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 4). The 5-day committed total would give a strong indication of whether or not packers are "short bought", meaning that a small 5-day committed total

would say that 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 in figure 4. While not shown, a longer running total of committed runs close to running total of delivered cattle, suggesting consistency of the data.

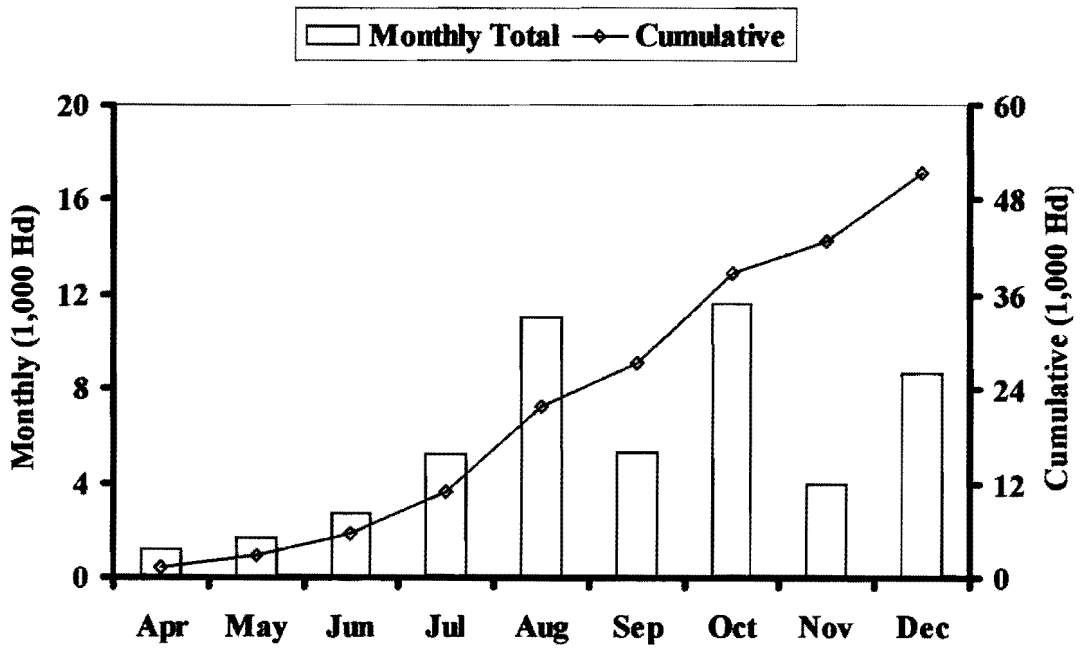
Another piece of data that may be useful is the breakdown of the committed and delivered cattle from each state. A data set of committed and delivered cattle from South Dakota could be examined to show the supply coming from this state. Such a breakdown might prove insightful for modeling temporal and spatial movements of cattle.

Packer Owned Cattle Reports

The weekly packer owned report 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. The forward contract volume data is not new. USDA-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, with corresponding basis levels, it would be possible to gauge long-run supply conditions.

Although the forward contract data are reported weekly, a monthly tally is probably more appropriate for assessing contracting behavior. Monthly totals and a cumulative total of forward contracted cattle for delivery in December of 2001 are shown

in figure 5. During August and October a relatively large number of cattle were forward contracted for December delivery, while the cumulative total increased at a steady pace. 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. However, given the low volume of head forward contracted the usefulness of such information may be limited.



Source: USDA-AMS & SDSU

Figure 5. Forward Contract Volume for December Delivery

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 as does the data from South Dakota. 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 UDSA-NASS. Those cattle not counted in the packer owned report were classified as negotiated. As shown in figure 6, negotiated sales accounted for 60 percent of the number of head slaughtered. The next largest category was for formula purchased cattle at 34 percent. Packer owned slaughter was 4 percent and forward contract slaughter was 2 percent.

The packer owned percentage is consistant 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.

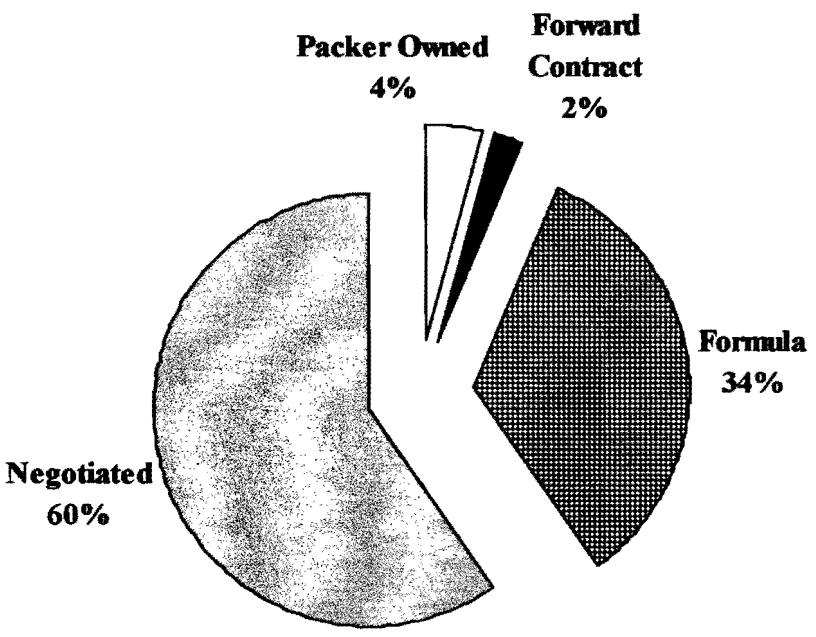


Figure 6. 1st Quarter 2002 Cattle Slaughter Breakdown

South Dakota livestock industry people have expressed concern about the common practice of 20-day contacts 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 practice of 20-day windows may also explain the forward contract volume seen during December in figure 5.

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 contact 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.

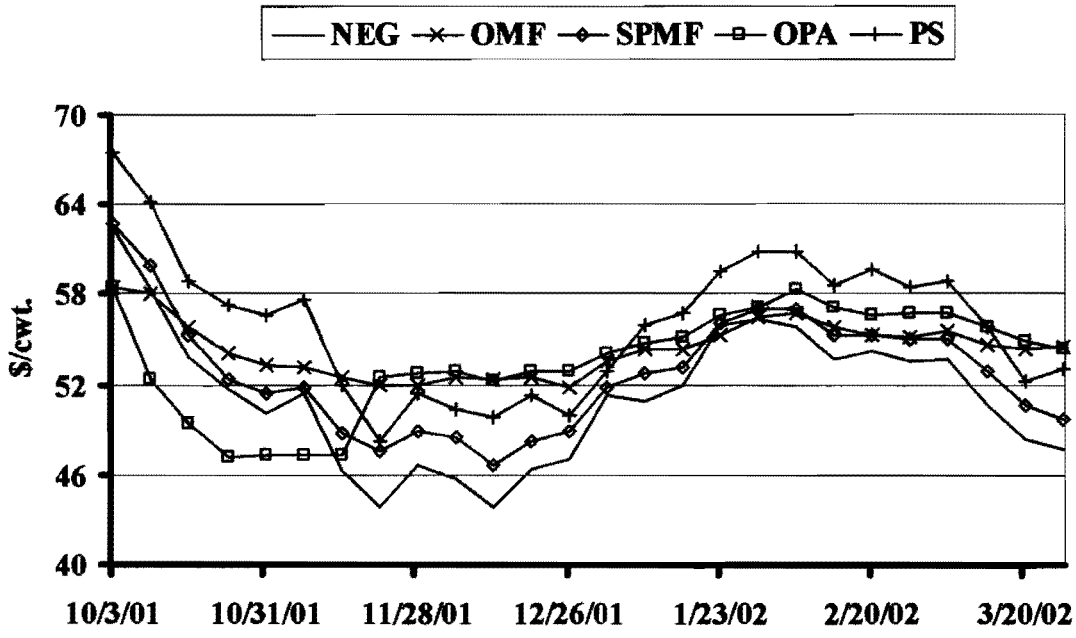
Similar reasoning applies to producers. By entering into the short-term contract a producer protects against any drop in price over the next 20 days, and a put option would be valued at a similar amount. Empirically, it is too early to clearly decipher what might be happening. A preliminary comparison shows the average difference between the 20-day contract prices and cash prices is less than $0.70.

Swine Reports

There was a smaller number of swine reports introduced relative to the cattle reports. Direct hog prices are reported twice a day at the national, eastern cornbelt, western cornbelt, and Iowa/Minnesota levels. The reports give head counts of purchases, base prices, and state-specific breakdowns for the origins of the purchases. The base price information is summarized in the prior day purchased reports with the same geographic breakdowns. While the base price would give indications of the general trends in the market, they are of limited usefulness when trying to discern location-specific demand. The sole weekly report covers non-carcass premiums. While informative, nothing is specific enough for localized decision making.

The most useful and informative 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 instead of just base prices. The prices subsequently feed into a daily lean hog carcass slaughter cost report. The prior day slaughtered report gives the daily head count and average net price for the following purchasing categories: negotiated (NEG), other market formula (OMF), swine or pork market formula (SPMF), other purchase arrangement (OPA), and packer sold (PS). A head count and slaughter characteristics are given for packer owned (PO) 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. That price should be comparable to the lean hog index in terms of establishing price trends.

The average net prices for the different purchasing categories from Wednesdays during the fourth quarter of 2001 and the first quarter of 2002 are shown in figure 7. As expected, the negotiated price shows the lowest lows and would presumably show the highest highs. GAO (1999) suggests the spot market reflects swine of lower quality and more weight variability. The formula prices tend to be higher than the negotiated prices, and follow the latter's trend quite closely. The other purchase arrangement price tends to behave differently, and appears to have been a smoothed out price during this time period. The packer sold price tends to be the highest price, but the Wednesday chart masks some daily variability. Perhaps such swine are sold in areas with a strong location basis.



Source: USDA-AMS

Figure 7. Wednesday Direct Hog Prices

To further understand the relevance of the prices, the number of head under each classification was tallied for the first quarter of 2001. The daily totals were added and compared to the federally inspected barrow and gilt slaughter for the first quarter. The shares in each category are shown in figure 8. The total in the slaughtered swine report was less than the federally inspected level, most likely because the former only covers direct sales. Assuming that non-direct sales would be spot purchases from auctions, the negotiated total reflects the residual after subtracting the classified category totals from the federally inspected total.

Formula purchases accounted for a majority slaughter volume. Negotiated purchases, at 22 percent of slaughter, are a much smaller percentage of total slaughter compared to cattle purchases. Packer owned purchases, at 15 percent, make up a

significantly larger percentage compared to cattle. The packer sold category, which tended to have above average prices, only accounts for 2 percent of slaughter.

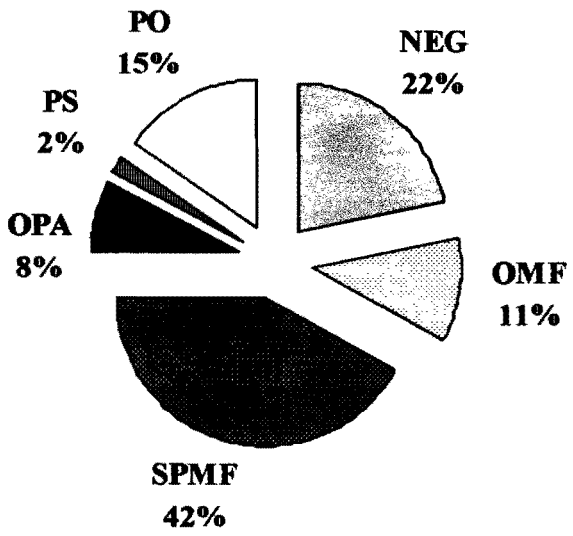
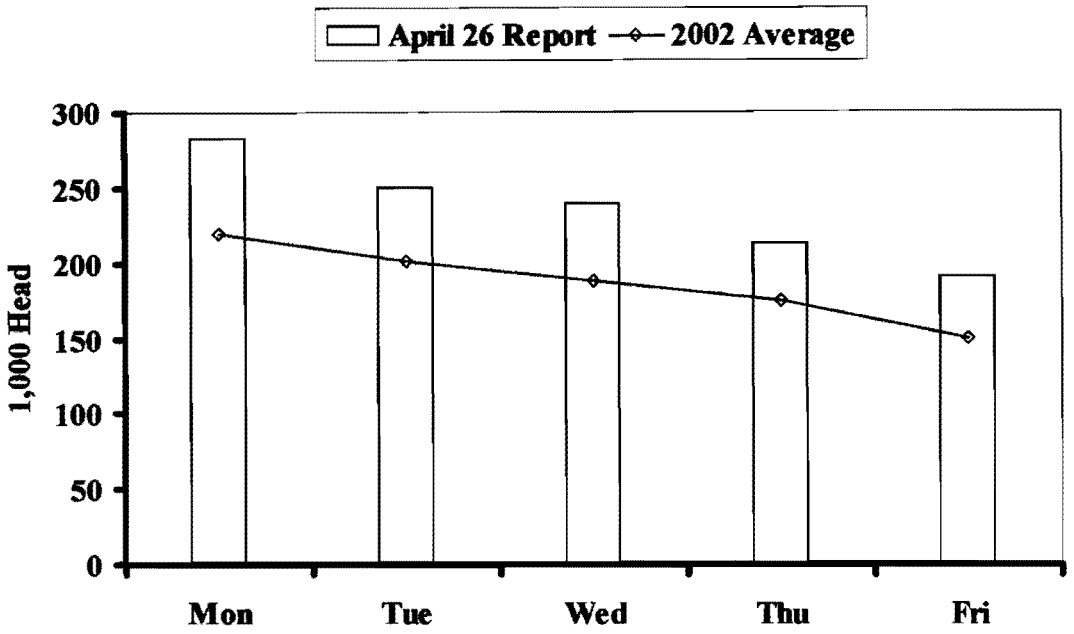


Figure 8. 1st Quarter 2002 Swine Slaughter Breakdown

Another informative aspect of the swine slaughtered report is the number of swine scheduled for delivery to packing plants. Each day the number scheduled for the following two weeks is reported. 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 average number of head scheduled for delivery was calculated on Fridays during the first quarter of 2002. The number scheduled for the following week, Monday through Friday, was used to compute the 2002 average shown in figure 9.



Sources: USDA-AMS & SDSU

Figure 9. Assessing Swine Scheduled for Delivery

The average number of head scheduled declines as one looks ahead through the week. The report from April 26 was used to compare the situation on that day to the average level scheduled. On April 26 packers had 20-30 percent more swine scheduled than normal, i.e., they had plenty of hogs lined up for slaughter. One would not have expected sharp increases in cash prices the following week. Had the levels been below the average amounts, producer could have used the information and waited for improved bids.

Implications

The livestock industry in South Dakota has seen mixed results from national mandatory price reporting. The immediate cost of reporting has been the loss of some

cattle price reports. However, the Sioux Falls price seems to reflect local activity well. 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.

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. GAO (2002) has recently noted that existing modeling efforts by USDA fail to account for such factors. 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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