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Grid Pricing Versus Average Pricing for Fed Cattle; Milk Production Increasing Faster Than Previously Thought

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GRID PRICING VERSUS AVERAGE PRICING FOR FED CATTLE

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The issue of improving beef's competitive position against other domestic meat products and foreign imports has been discussed widely by groups associated with the beef industry. In an effort to improve beef's competitive position, the Value Based Marketing Task Force (1990) was created. The Task Force recommended that a value based pricing system for fed cattle containing premiums and discounts beyond dressed weight and grade be adopted. The goal of the Task Force's proposal was to encourage producers to raise leaner cattle that still will grade at least USDA low choice. The industry responded to this proposal by developing individual carcass pricing systems commonly referred to as Grid Pricing Systems. These systems have been widely discussed in the beef marketing literature.

The economic literature on price discovery suggests that the implementation of a new premium and discount pricing system as an alternative to average pricing (live weight or dressed weight sales) will increase per-head revenue variability. The price discovery literature on buyer and seller behavior in the market for slaughter cattle makes a strong case that varying degrees of incomplete information generate uncertainty over quality and quantity of cattle marketed via the live and dressed weight alternatives. This uncertainty, combined with risk averse behavior, creates price differentials between alternatives and sustains the demand by cattle producers for multiple pricing alternatives. Accordingly, the grid pricing will not receive broad producer support unless the new system raises the average price per cwt. (relative to other pricing alternatives) enough to compensate

(Continued on p. 2)

MILK PRODUCTION INCREASING FASTER THAN PREVIOUSLY THOUGHT

by

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In its April report the USDA World Agricultural Outlook Board (WAOB) increased its projection of milk production by a whopping 0.75% compared to its March projection. The WAOB Supply and Demand Estimates, released on April 10, puts the US milk production at 167.1 billion pounds for the 1999-2000 marketing year. This is a 3.7% and 6.8% production increase over the 1998-99 and 1997-98 marketing years, respectively. (The marketing year runs from October 1 through September 30.)

Despite declining milk prices, milk production continues to out pace year ago levels due to more cows being milked and more milk per cow (see Figure 1). While cow numbers declined for many years until late 1998, numbers began to increase in earnest in 1999 and continue to increase in 2000 (see Figure 2). At the same time, milk production per cow has been increasing since 1998. Production per cow was greater in every month of 1999 compared to 1998 (see Figure 3). The same applies to 2000 compared to 1999. To remove the differences in monthly production due to months not being of the same length, production values were converted to 30 day months.

The Force Driving Expansion

Low grain prices are seen as the current driving force for the continued expansion in milk production, causing milk prices to fall from record highs last year to 20 year lows in April 2000. The milk-feed price ratio, which indicates the pounds of

(Continued on p.4)

(*Grid Pricing... cont'd from p.1*)
producers for the increased price variability.

Keeping other factors constant, the above-average cattle are expected to command a higher price under the grid pricing as compared to the hot carcass weight pricing -- a positive price differential. In other words, the cattle in the above-average pen, if sold under the hot carcass weight pricing method, are, in effect, subjected to an implicit discount. Similarly, keeping other factors constant, the below-average cattle are expected to receive a lower price under grid pricing as compared to the hot carcass weight price -- a negative price differential. In other words, the cattle in the below-average pen, when sold under the hot carcass weight pricing, receive an implicit premium compared to grid pricing.

In a recent study titled "Grid Pricing Versus Average Pricing for Fed Cattle: Where is the Incentive," (Economics Staff Paper #2000-5, which can be obtained by contacting Ms. Janet Wilson, Economics Department, Scobey Hall, SDSU, Brookings, SD 57006, Phone 688-4141), we conducted a weekly comparative study of selling fed cattle on a grid pricing system relative to selling dressed weight over a three year period. This article draws heavily on that study.

Data Description and Methods

The analysis is based on the carcass data combined with weekly grid pricing market data collected over a 154 week period from January 1997 to December 1999. The carcass data is from 2590 calves entered by 250 South Dakota beef producers during the first half of the 1990s into the Retained Ownership Demonstration Program run by the Animal and Range Science Department at South Dakota State University. Under the program, animal science researchers raised the calves to slaughter weight, sold the calves to packers, and collected the carcass data. From these 2590 carcasses, two data sets, each consisting of 1500 randomly selected carcasses, were constructed. One set was designed to be 67% choice and 33% select (above-average pen). The other was 33% choice and 67% select (below-average pen).

The dressed weight carcass revenues were determined by applying the weekly USDA reported hot carcass weight price for dressed weight sales of slaughter steers grading 35% to 65% choice in 5 areas (Texas/Oklahoma, Kansas, Nebraska, Colorado, Iowa/So Minn.). The grid pricing system utilized in this study is a three-dimensional system (yield grade, quality grade, and dressed carcass weight), developed by the Agricultural Marketing Service (AMS 1997) division of the USDA for the purpose of price reporting. For each individual steer, a grid carcass price was deter-mined weekly by applying the reported premiums and discounts according to the carcass charac-teristics regarding yield grade, quality grade, and weight classification.

Lastly, the weekly price differential (grid price per cwt. minus hot carcass weight price per cwt.) for the above-average and below-average data sets were derived. An important feature of this approach is that *cattle quality characteristics are held constant over time*. Therefore, changes in the price differential are due solely to changes in market premiums and discounts.

Results

Premiums and discounts under the grid pricing system are, in part, influenced by the relative availability of high quality animals which, in turn, are seasonal in nature as shown by the plot of the grade percentage and choice select spread for the study period (Figure 1). A regression analysis of the above-average pen data revealed the following results:

- Holding seasonal variation constant, the cattle in above-average pen (when sold under dressed weight method) took an implicit discount of $1.35 per cwt. on average.
- The implicit discounts for above-average cattle were significantly less (as much as 28 to 67 cents per cwt.) during January through May, and significantly more severe (as much as 44 cents per cwt.) during the fall season.
- During the154 week period, the average implicit discount levied on the above-average cattle marketed at an average price remained unchanged, i.e. there was no significant trend in the size of the average discount over this period.

The decline in the grid price relative to dressed weight price during the spring is most likely driven by the seasonal variation in the choice/select spread. The lack of a significant time trend for the above-average pen is interesting. The value based marketing literature suggests the risk to reward structure of a value based pricing system, like grid pricing, should reward producers for producing

Fig 1. Grade Percentage and Choice Select Spread

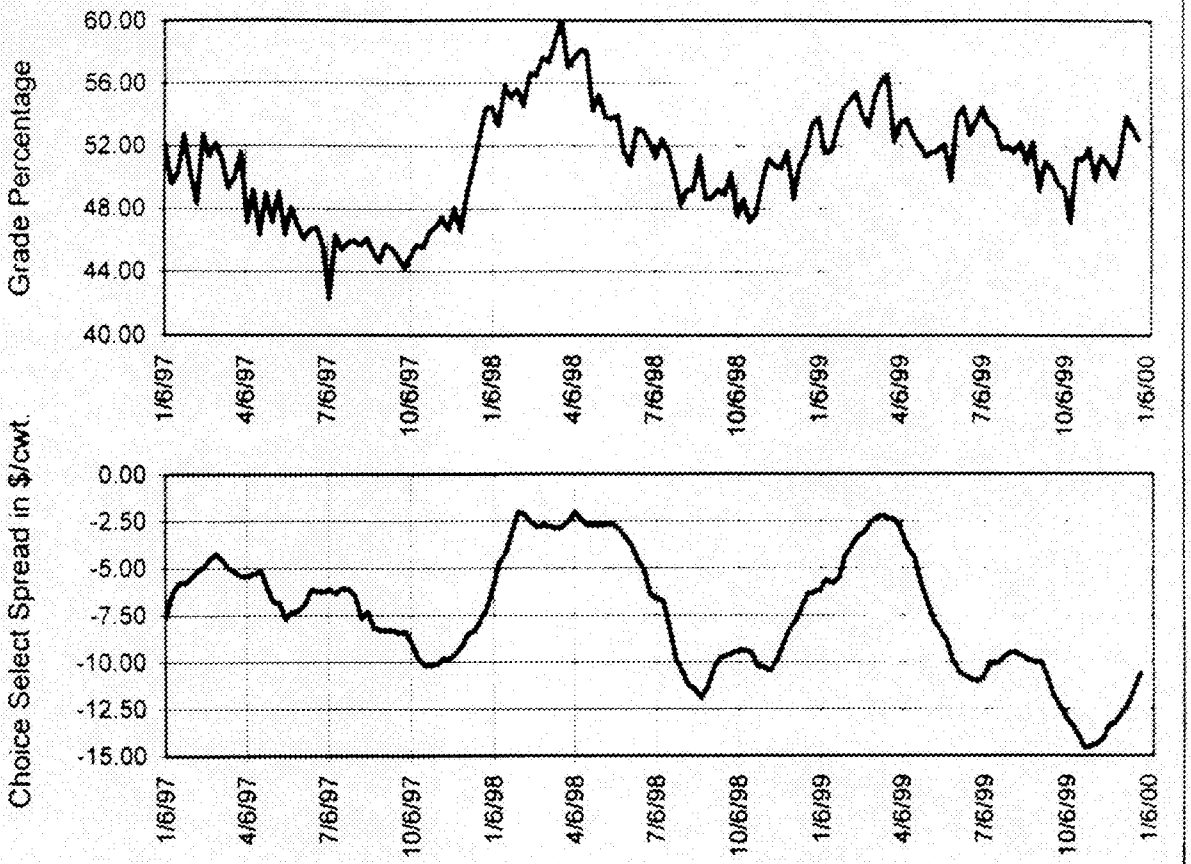
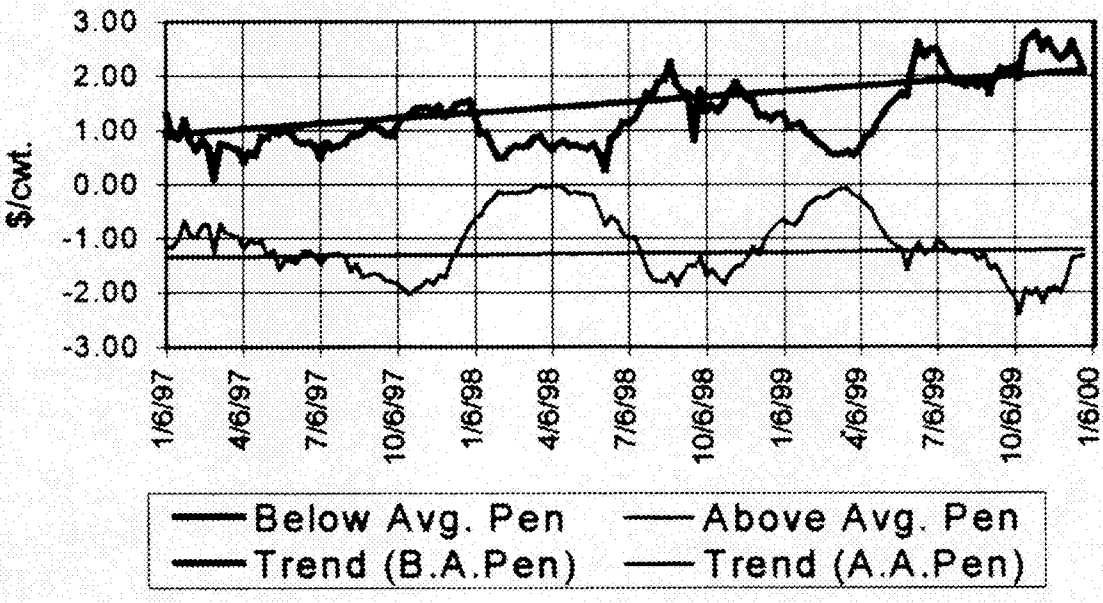


Fig 2. Trends in Implicit Premiums (Discounts)



superior quality cattle. The insignificant time-trend suggests that the premium structure of the grid system did not change over the study period.

(See Figure 1)

A regression analysis of the below-average pen data revealed the following results:

- Holding seasonal variations constant, the cattle in the below-average pen (when sold under the dressed weight system) received an implicit premium of $0.92 per cwt. on average.
- The implicit premiums for the below-average cattle were significantly smaller (as much as 39 to 60 cents per cwt.) during February through May. The main reason for this was that during these months the dressed weight price improved relative to the grid price.
- During the154 week period, the average implicit premium increased at the rate of 0.75 cents a week (or $1.16 per cwt. over the 154 week period).

Implications For Fed Cattle Producers

A time trend analysis in this study provides additional insight into the process of adjustment in the grid premiums and discounts. Over time, the seasonally adjusted implicit discount for cattle in the above-average pen has been stationary, and the seasonally adjusted implicit premium for cattle in the below-average pen has been increasing. In other words, the implicit premium that producers receive when they sell below-average cattle at a dressed weight price has increased over time. On the other hand, the seasonally adjusted implicit discount producers receive when selling above-average cattle at a dressed weight price has not shown any trend over time. The ramification is that the incentive for producers to market their above-average cattle on an individual pricing system, as opposed to selling at an average price, has eroded during the time period examined. Specifically, the incentive to sell at an average price has strengthened relative to selling on a grid for those producers who are uncertain about the quality of their fed cattle.

The implicit premium and discount associated with selling at an average price has a strong seasonal pattern (Figure 2). The spread between the implicit discount and premium is narrow during the months of February through May. This implies a lower incentive to market on a grid as the risk to reward ratio narrows. In the fall months, the implicit discount on above-average cattle increases, resulting in a wider spread between the implicit discount and the implicit premium. This implies a somewhat greater incentive to market above-average cattle on a grid. These results are consistent with the seasonal pattern in the choice-select spread.

(See Figure 2)

Summary

The results of the study support the conclusions arrived at in the earlier literature on the existence of implicit premiums and discounts when fed cattle are sold at an average price. Time series analysis covering a period of 154 weeks (from January 1997 to December 1999) reveals a seasonal component to the fluctuations in the implicit premiums and discounts associated with selling fed cattle at an average price. Also, statistical results indicate that the seasonally adjusted implicit discounts for selling above-average quality cattle has not shown any trend during the study period, while the seasonally adjusted implicit premiums for selling below-average quality cattle has been increasing during the study period.

Within the framework of the value based pricing concept for fed cattle, it is expected that the grid premium and discount structure would trend toward levying greater penalties on below-average cattle and providing greater premiums for above-average cattle. Our results provide the evidence that the grid system has been levying greater penalties over time on below-average cattle. However, we did not find any evidence that the grid system has been providing higher premiums over time for the above-average cattle. A combined impact of over time increasing penalties on below-average cattle and stationary premiums on above-average cattle is, in effect, reduced incentives for producers to switch from average to individual pricing. Unless the structure of the grid premiums and discounts provide additional incentives to producers, the adoption of value based marketing will continue to be limited.

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(Milk Production... cont'd from p.1)
16% protein dairy feed that can be purchased by the sale of 100 pounds of milk, dropped from a high of 4.17 last September to 2.88 in March 2000

(see Figure 4). While this is a significant blow to profitability, and should slow expansion, it is still above historical values. Moreover, compounding the problem is the fact that many large, full time dairies have already contracted, or otherwise locked in, grain prices for the next year. This will delay any slowdown in their production until they need to buy grain at higher prices. This puts smaller dairies, that grow most of their own feed, at a disadvantage because their grain and forage production costs do not decline. In some cases, their production costs for feed may actually be above market prices.

Figure 1

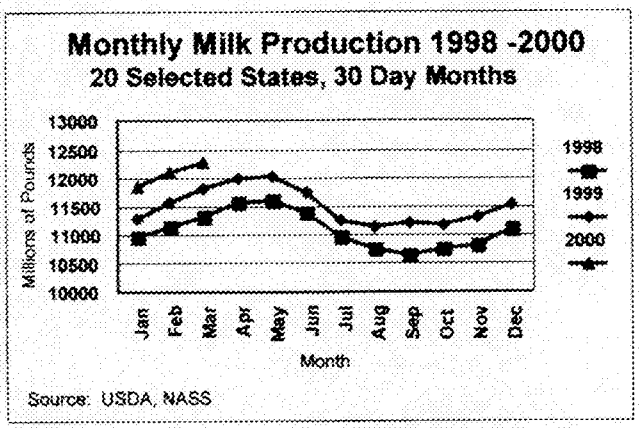
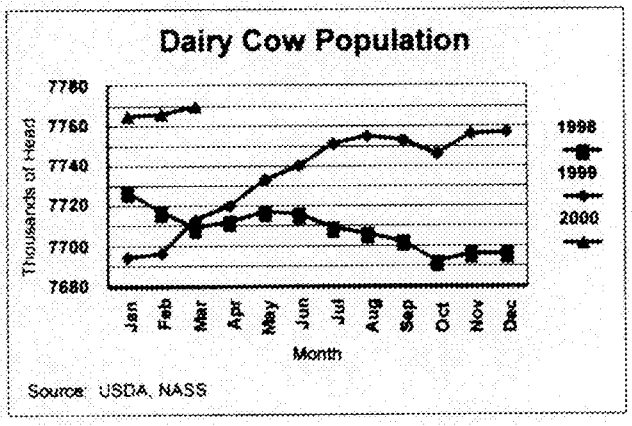


Figure 2



Despite the projected increase in production, the WAOB did not change the midpoint of its projected milk prices for the coming year. Prices for 1999-2000 are projected to be $10.25 per cwt, plus or minus $.15 for Class III, and $12.60 plus or minus $.15 for all milk. The ranges were wider in the March report, but the midpoints were the same. Projected prices are being underpinned by expanded government purchases of dairy products and growing exports bolstered by the DEIP (Dairy Export Incentive Program). Also, butter purchases by the Commodity Credit Corporation (CCC) are projected to grow from 1 million pounds in 1998-99 to 15 million pounds in 1999-2000 and cheese purchases are expected to grow to 10 million pounds compared to 6 million last year. On April 17, the prices of block and barrel cheese both dropped below the CCC support prices of $1.10 and $1.07 per pound, respectively, at the Chicago Mercantile Exchange (CME) cash auction. Barrel prices have recovered 3 cents since then, but block prices are still below the support price. Nonfat dry milk purchases will likely grow from 499 million pounds last year to 680 pounds during the current year, and dry whole milk purchases will grow by nearly 3 fold, from 12 million pounds last year to 35 million pounds this year. Total commercial use of milk, on a milk equivalent, milkfat basis, is projected to grow from 162.8 million pounds last marketing year to 169.5 million pounds this year, with expanding export activity playing a major role in this expansion.[1]

Figure 3

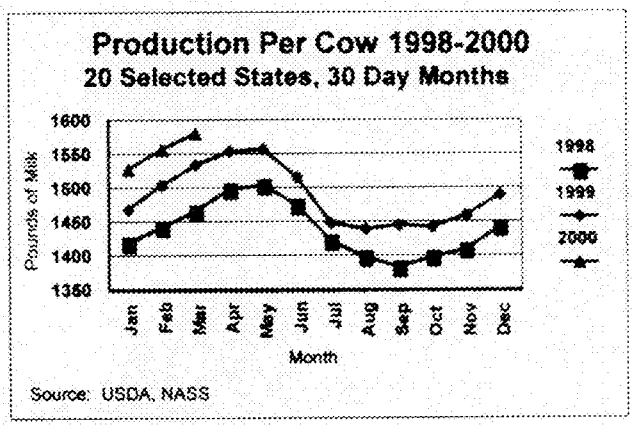
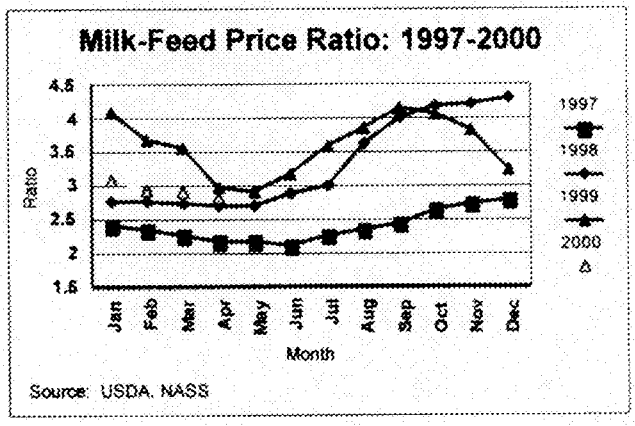


Figure 4



[1]These numbers include imports and exports, but no farm use or CCC removals under the price support system.

Marketing Choices

Developing a marketing plan under these circumstances is much more difficult than it was a year ago when milk prices were near, or at, record high levels. If one is unprotected in the open market, and is of the opinion that the futures prices for the summer or fall months will decline as the summer approaches and passes, the least costly way to protect the current price is to hedge the unpriced milk. Should a rally develop, calls can be purchased to offset margin calls. This creates a synthetic put. If one can't afford to have prices go any lower, but has reason to believe that they will likely go higher, buying price insurance by using puts may be the best way to go. This puts a floor on prices, but allows the producer to participate in a price upswing, should one occur. On the other hand, if one is of the opinion that prices will go no lower under any circumstances and will likely go up, and if he can afford to stand any losses in case he is wrong, then doing nothing may be the most desirable choice.

On the other side of the equation, given the outlook for higher grain prices, locking in input costs may prove to be a wise move. Expanded imports and/or a less than normal grain production year could put meal and grain prices considerably higher. Using price protection on this side of production could save a significant increase in input costs.

The ERS USDA price projections for all milk during the next three quarters (II, III, and IV) of calendar year 2000 are $11.80 plus or minus $.20, $12.75 plus or minus $.30, and $14.20 plus or minus $.50, with Class III prices $9.90 plus or minus $.20, $11.20 plus or minus $.35, and $12.60 plus or minus $.50, respectively. Given the expansion going on and the factors that favor more production per cow, the author feels that the likelihood of prices moving much above these midpoints is less than 50 percent. But there are two forces that could prove him wrong. One would be a very hot summer, causing a significant decrease in milk production in the major dairy states. The second would be higher grain prices forcing dairies to cut back in concentrate feeding. But there would be a significant time lag before milk production and prices would respond to an increase in input costs. Finally, grain prices are going to be closely tied to weather conditions through the growing season. Consequently, there could be some frequent and sizable price moves in the grain market before harvest with little impact on milk prices.

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