FEEDER CATTLE BASIS IN SOUTH CAROLINA 2000-2004

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FEEDER CATTLE BASIS TABLES FOR SOUTH CAROLINA 2000-2004

Introduction

Cattlemen in South Carolina, like their counterparts across the country, face substantial price risks in marketing their cattle and calves. Many cattlemen continue to buy and sell their cattle without forward pricing, accepting the cash market price on the day of sale. However, an increasing number of cattlemen are taking advantage of the opportunities to reduce their price risks by using forward cash contracts, feeder cattle futures, and/or options on feeder cattle futures to forward price their cattle purchases and sales. The design and implementation of an effective forward pricing strategy requires information on the feeder cattle basis. This report provides feeder cattle basis tables for South Carolina from 2000 through 2004. These tables update and expand the basis information in two earlier Clemson University Extension reports: Forward Pricing Feeder Cattle in South Carolina (EER 118, March 1990) and Feeder Cattle Basis Tables for South Carolina 1991-1994 (EER 158, April 1995). If you are not already familiar with futures and options, you should consult EER 118 which is available from your local Cooperative Extension office.

What is Basis?

An understanding of the basis is essential in developing a cattle marketing plan. Even if you plan to use forward cash contracts instead of futures or options markets to forward price your cattle, you need to understand the basis in order to evaluate those contracts.

Basis is defined as the differences between a local cash price and a specific futures price. As discussed in more detail below, the specific feeder cattle futures price for use in basis calculations is for the futures contract maturing nearest to, but not before, the feeder cattle transaction (purchase or sale) that is to be forward priced. The basis will be negative if the local cash price is lower than the futures price or positive if the local cash price is higher than the futures price. Within any market area, the basis for feeder cattle differs according to the weight of the cattle, whether the cattle are steers or heifers, and the season of the year. Across markets, the basis will differ based on relative costs of transporting feeders to feedlots.

Like other agricultural futures contracts, most feeder cattle contracts are offset by opposite futures transactions before the contracts expire. For example, the sale of a March
feeder cattle futures contract in January could be offset by buying a March contract before the expiration of the March contract. However, feeder cattle futures differ from other agricultural futures in that feeder cattle contracts that have not been offset prior to expiration are settled with cash payments rather than physical delivery. Feeder cattle futures are based on a quantity-weighted index of feeder steer cash prices. For futures expiring between September 1986 and November 1992, the price index was based on cash market prices of 600-800 pound feeder steers in 27 states. From January 1993 through June 1, 2005, the cash settlement price was changed to a quantity-weighted index of prices in 12 states (located mainly in the Midwest and Southwest) for 700-799 pound Medium Frame #1 and Medium and Large Frame #1 steers. Starting with the August 2005 contract, the index will be based on 650-849 pound Medium and Large Frame #1 and #2 steers. The cash settlement provisions of feeder cattle futures insure that the price index and the futures price will be equal at contract maturity. This means that the basis for the price index and the maturing futures will be zero at contract maturity.

Although South Carolina is not among the states whose cash steer prices are used to calculate the feeder cattle price index, our cash prices are nonetheless related to that index – South Carolina prices for 650-849 pound Medium Frame #1 steers should be within plus or minus the transportation cost of shipping steers between South Carolina and the states represented in the index. If South Carolina prices plus shipping costs were lower than the price index, profits could be earned by shipping our steers to the index states. This would reduce the quantities available in South Carolina and cause our prices to increase relative to the index price. On the other hand, if South Carolina prices were higher than the index price plus shipping costs, profits could be earned by shipping index state steers to South Carolina. This would increase the quantities available in South Carolina and cause our prices to decrease relative to the price index.

Figures 1 to 8 show monthly average nearby feeder cattle futures prices and monthly average cash prices in South Carolina for selected steer and heifer weight categories from January 2000 through December 2004. These figures show one common pattern – the cash and nearby futures prices tend to move up and down together. This means that while predicting cash prices is difficult, if not impossible, the differences between cash and futures prices (or basis) can be predicted with relative accuracy. It is this feature that makes forwarding pricing using futures practical.
Despite the common up and down movements in Figures 1 to 8, there are differences in the cash prices per cwt. according to the weight and sex of the cattle. Figures 1 and 2 show that steer prices per cwt. decrease as the steer weights increase. Figures 3 and 4 show that the same relationship is true for heifer prices -- heifer prices per cwt. decrease as their weight increases. Figures 5 to 8 show that steer prices per cwt. are higher than heifer prices per cwt. for a given weight category. The upshot is that the South Carolina basis with respect to a particular futures contract differs across cattle weights and sex: the South Carolina basis is stronger (the cash price is higher relative to futures) for lighter cattle versus heavier cattle of the same sex, and for steers versus heifers of the same weight.

Figures 1 to 8 also show strong seasonal patterns in South Carolina’s cash prices. Our cash prices are usually higher in the spring when cattlemen are buying to stock their pastures, and are usually lower in the fall when cattlemen are selling to avoid having to feed their cattle during the winter. There is less seasonality in the price of nearby futures (i.e., the futures contract nearest maturity), so the South Carolina basis is usually stronger in the spring than in the fall.

The figures also show that in general there tends to be a closer correspondence in the movements of the futures price and the cash price for heavier steers than for lighter steers, and for steers rather than heifers of the same weight. This follows since the heavier steer categories are closer to the specifications of the cattle covered by the feeder cattle futures price index.

**Calculating the Basis**

The local cash calf and cattle prices used to calculate the basis were obtained from the South Carolina Department of Agriculture and the United States Department of Agriculture through the Livestock Market News Service. Each week, the Livestock Market News reports the range of cattle prices, by weight and sex categories, from South Carolina’s livestock auctions. The weekly average of daily settlement prices for nearby feeder cattle futures as reported by the Chicago Mercantile Exchange was subtracted from the mid-range of the cash prices to obtain the weekly basis for each weight and sex category. The monthly basis data were then calculated by averaging the weekly basis data.
Reading the Basis Tables

Tables 1 to 5 give the results for the steer weight categories and Tables 6 to 10 give the results for the heifer weight categories. The first column of each table lists the months of the calendar year. The second column contains the futures contract month that matures nearest to, but not before, the corresponding calendar month. The feeder cattle futures contract months are January, March, April, May, August, September, October, and November. The calendar months of February, June, July, and December thus have nearby futures that mature one or more months in the future. The figures in the body of the tables represent the average nearby basis for each calendar month of the individual years from 2000 through 2004, and average across years for 2000-2004 and 2003-2004.

To illustrate, suppose that you want to consider the South Carolina nearby basis for 650 lb. feeder steers in March. This weight falls in the rage of 600-700 lb. steers reported in Table 4. Read down the first column to find the March (MAR) row, and then read across. Since there is a March futures contract, that contract is the nearby futures as shown in the second column of that row. The remaining row entries would be interpreted as follows:

<table>
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<tr>
<th>Entry</th>
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</tr>
</thead>
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<tr>
<td>-0.30</td>
<td>from 2000 through 2004, the March cash price of 600-700 lb. steers in (South Carolina) averaged $0.30/cwt. under the nearby (March) futures price,</td>
</tr>
<tr>
<td>-0.50</td>
<td>from 2003 through 2004, the March cash price of 600-700 lb. steers in (South Carolina) averaged $0.50/cwt. under the nearby (March) futures price,</td>
</tr>
<tr>
<td>1.34</td>
<td>during March 2000, the cash price of 600-700 lb. steers averaged $1.34/cwt. over the nearby futures price,</td>
</tr>
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<td>-0.27</td>
<td>during March 2001, the cash price of 600-700 lb. steers averaged $0.27/cwt. under the nearby futures price,</td>
</tr>
<tr>
<td>-1.56</td>
<td>during March 2002, the cash price of 600-700 lb. steers averaged $1.56/cwt. under the nearby futures price,</td>
</tr>
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<td>-2.94</td>
<td>during March 2003, the cash price of 600-700 lb. steers averaged $2.94/cwt. under the nearby futures price,</td>
</tr>
<tr>
<td>1.94</td>
<td>during March 2004, the cash price of 600-700 lb. steers averaged $1.94/cwt. over the nearby futures price,</td>
</tr>
</tbody>
</table>
There is variation from year to year in the basis data for this example, and in the basis data for the other sex and weight categories reported here. However, the variation in the basis is usually less than the variation in the cash prices. For this example, the range in the March basis was $4.88 (from -$2.94 to $1.94) about 20 percent of the $23.78/cwt range in the average March cash price (March cash prices from 2000 through 2004 ranged from a high of $94/cwt in 2004 to a low $70.25/cwt. in 2003).

The basis tables reflect the differences in cash price behavior across seasons and across the weight and sex categories discussed above:

- within each weight and sex category, the basis is usually stronger in the spring and weaker in the fall,
- within each season and sex category, the basis is usually stronger for lighter cattle than for heavier cattle,
- within each season and weight category, the basis is usually stronger for steers than for heavier, and
- the basis is relatively less variable for heavier steers than for lighter steers, and for steer than for heifers of the same weight.

**Using Basis Information**

The basis data reported here have several major uses for South Carolina cattlemen – making decision on whether to hedge cattle sales or purchases with feeder cattle futures, making decisions on whether to use options or feeder cattle futures as a form of price insurance, and making forward cash contracting decisions.

**Making Hedging Decisions**

Knowledge of the basis is essential in using feeder cattle futures to manage price risks and insure acceptable returns. Cattlemen use feeder cattle futures for two-types of hedges, a production (or output) hedge and a procurement (or input) hedge.

A production hedge is used to “lock-in” a price for a subsequent sale of feeder cattle. To utilize the basis information reported here to estimate the expected price from a production hedge, you would proceed as follows.
1. Select the basis table corresponding to the weight and sex of the cattle that you will sell in the cash market. For example, if you would expect to sell 750 lb. steers in your local cash market in April, you would use Table 5 (700-900 lb. steers).

2. Go down the left column to the month in which you expect to sell your cattle, April in the example. Read across the row to find the appropriate feeder cattle futures contract month and the average basis from 2000-2004. In the example, the April futures contract is appropriate and the average basis from 2000-04 is -$10.11. This average basis is an estimate of the basis when the production hedge would be lifted.

3. Determine the expected price from the hedge by adding the current price of the appropriate futures contract and the basis estimate. For the example, if April futures are traded at $85/cwt, the expected price would be $85 plus the basis of -$10.11 equaling $74.89/cwt. Hedging costs such as futures commissions would be subtracted from expected price to obtain the expected net price.

A procurement hedge is used to “lock-in” a price for a subsequent purchase of feeder cattle. The steps in determining the expected price of a procurement hedge are identical to the above: find the appropriate basis table and the appropriate futures contract month, and then add the estimated basis to the current price of the appropriate futures contract month. However, hedging costs would be added to the expected price to obtain the expected net price.

The expected prices with production and procurement hedges do no “lock-in” prices with 100 percent accuracy since the actual basis when the hedges are lifted can be stronger or weaker than expected. This uncertainty about the actual basis is called basis risk.

**Making Options Decisions**

Trading in feeder cattle futures options allows cattlemen to purchase a form of price insurance for subsequent feeder cattle sales or purchases. **Buying put options** establishes a **minimum price** for subsequent cattle sales without foregoing gains from higher cash prices, while **buying call options** establishes a **maximum price** for subsequent cattle purchases without foregoing gains from lower cash prices.
The estimated minimum net price from buying a put is obtained from the formula

\[
\text{Estimated minimum net price} = \text{Put option strike price} + \text{Estimated basis} - \text{Put option premium} - \text{Hedging costs}
\]

The estimated maximum net price from buying a call is obtained from the formula

\[
\text{Estimated maximum net price} = \text{Call option strike price} + \text{Estimated basis} + \text{Call option premium} - \text{Hedging costs}
\]

The estimated basis is required in both formulas and can be obtained in the same way as when making hedging decisions: finding the appropriate basis table and futures contract month and then use the 200-2004 average basis as the estimated basis. As with hedging by using futures, marketing strategies involving options are subject to basis risk. However, it is important to remember that the basis is less variable than the futures market.

**Making Forward Cash Contracting Decisions**

Forward cash contracts are commonly used by cotton, soybean, wheat and corn growers to forward price their crops. Although less common in livestock marketing, some buyers offer forward cash contracts that allow their cattlemen clients to price their cattle before delivery.

There are four major types of cash forward contracts:

- a **fixed price** forward cash contract fixes an exact price before delivery,
- a **basis** forward cash contract fixes an exact basis with respect to a specific futures contract before delivery, and can be converted, upon notifying the buyer, to a fixed price contract by adding the contract basis to the specific futures price,
- a **minimum price** forward cash contract specifies a minimum price before delivery and the cattlemen receives the maximum of the contract price or the going cash market price at delivery after paying an “insurance premium” to the buyer, and
- a **maximum price** forward cash contract specifies a maximum price before delivery, and the cattlemen pays the minimum of the contract price or the going cash market price at delivery after paying an “insurance premium to the buyer”
Fixed price and/or basis contracts may be available to forward price the cattlemen’s purchases or sales, minimum price contracts are used to forward price only the cattlemen’s sales, and the maximum price contracts are used to forward only the cattlemen’s purchases.

A buyer who offers forward contracts to the cattlemen offsets his forward contract obligations by hedging in the feeder cattle futures and/or options markets and thus incurs hedging costs. Moreover, a buyer cannot predict the basis with 100 percent accuracy and thus incurs basis risk. The buyer’s hedging costs and basis risks will be reflected in his forward contract bids and thus the effective basis he is offering. A cattleman can compare the effective basis offered on forward cash contracts to the average historical basis from the relevant basis table. The effective basis on contracts to forward price the cattleman’s sales may be discounted relative to the historic basis, while the effective basis on contracts to forward price the cattleman’s purchases may be at a premium to the historic basis. The buyer uses these discounts and premiums to cover the basis risk and hedging costs he incurs when offering forward contracts.

From the cattleman’s perspective, the results obtained by forward contracting can be obtained by directly trading futures or options with two major exceptions: the basis is guaranteed so there is no basis risk and there are no explicit hedging costs under forward contracting.

In evaluating forward contracts, the cattleman must decide whether the absence of basis risks and explicit hedging costs with forward contracting are worth the discounts or premiums reflective in the effective basis of the forward contracts.

Summary

Understanding the basis is a key element in designing effective marketing strategies for feeder cattle. This report has presented up-to-date basis tables for South Carolina feeder steers and heifers, and a brief discussion of how basis information can be used in decision-making.
Table 1. Feeder Cattle Basis for 300-400 lb. Steers in SC. (Using Nearby Futures Contract).

<table>
<thead>
<tr>
<th>Calendar Month</th>
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Table 2. Feeder Cattle Basis for 400-500 lb. Steers in SC. (Using Nearby Futures Contract).

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Table 3. Feeder Cattle Basis for 500-600 lb. Steers in SC. (Using Nearby Futures Contract).

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Table 4. Feeder Cattle Basis for 600-700 lb. Steers in SC. (Using Nearby Futures Contract).

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Table 5. Feeder Cattle Basis for 700-900 lb. Steers in SC. (Using Nearby Futures Contract).

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Table 6. Feeder Cattle Basis for 200-300 lb. Heifers in SC. (Using nearby futures contracts).

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Table 7. Feeder Cattle Basis for 300-400 lb. Heifers in SC. (Using Nearby Futures Contract).

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Table 8. Feeder Cattle Basis for 400-500 lb. Heifers in SC. (Using Nearby Futures Contract).

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### Table 9. Feeder Cattle Basis for 500-600 lb. Heifers in SC. (Using Nearby Futures Contract).

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### Table 10. Feeder Cattle Basis for 600-700 lb. Heifers in SC. (Using Nearby Futures Contract).

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Figure 1. Nearby Feeder Cattle Futures and SC Cash Steer (3-4, 4-5, 5-6 cwt) Prices, 2000-2004
Figure 2. Nearby Feeder Cattle Futures and SC Cash Steer (6-7, 7-9 cwt) Prices, 2000-2004
Figure 3. Nearby Feeder Cattle Futures and SC Cash Heifer (2-3, 3-4, 4-5 cwt) Prices, 2000-2004
Figure 4. Nearby Feeder Cattle Futures and SC Cash Heifer (5-6, 6-7 cwt) Prices, 2000-2004
Figure 5. Nearby Feeder Cattle Futures and SC Cash Steer and Heifer (3-4 cwt) Prices, 2000-2004
Figure 6. Nearby Feeder Cattle Futures and SC Cash Steer and Heifer (4-5 cwt) Prices, 2000-2004
Figure 7. Nearby Feeder Cattle Futures and SC Cash Steer and Heifer (5-6 cwt) Prices, 2000-2004
Figure 8. Nearby Feeder Cattle Futures and SC Cash Steer and Heifer (6-7 cwt) Prices, 2000-2004