



Fed Cattle Pricing: Basis Contracts

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Many cattle feeders are interested in pricing fed cattle with a basis forward contract and most packers will provide basis bids at feeders' requests. This extension fact sheet describes the forward contracting process and identifies advantages, disadvantages, and issues related to basis contracting.

Basis and Basis Contracting

Basis is the cash price minus the futures market price at the time of a transaction. More specifically, basis is the cash market price at the time fed cattle are delivered for slaughter less the price for the nearby futures market price at the same time. For example, assume a feeder has cattle on feed in November and expects to market those cattle in early January, the relevant basis for evaluating a basis contract is the expected cash market price for fed cattle in early January less the futures market price for the February live cattle futures market contract (i.e., the nearby futures contract price).

Both cash market prices and futures market prices fluctuate widely. For example, it would be difficult in November to forecast the cash and futures prices for January separately. During the time cattle are in the feedlot, cash and futures market prices can swing sharply in either direction. However, the relationship between cash and futures market prices remains relatively stable. The two price series move in the same general direction. Both may increase sharply and both may decrease sharply but they move together. The difference between the two prices, cash and futures, can also vary, but regardless whether cash and futures increase or decrease, the difference will remain within a relatively narrow range. Therefore, basis fluctuates less than either the cash market alone or the futures market alone. Or, using our example, the basis for January is relatively easy to forecast in November.

Feeders and packers can lock in a basis with a basis contract. Then both are assured the transaction price will move in lock-step with futures market prices. The difference between the transaction price and the futures contract price is the contracted level of basis. Forecasting basis is easier than forecasting the level of either cash prices or futures market prices. Thus, estimating an appropriate level of basis for a contract is easier than estimating an absolute price that would be associated with a fixed price forward contract.

Basis exhibits a seasonal pattern and may change abruptly when futures contract specifications change. Therefore, anyone wanting to use basis forward contracts needs

to understand historical basis patterns and the factors that influence the basis level. Basis can be positive, meaning fed cattle prices are higher than futures market prices; or negative, meaning futures market prices are higher than fed cattle prices. Figures 1 and 2 show seasonal basis indexes for fed steers and heifers at Amarillo, Texas, over the 1991-2000 period. The darker line is the average basis and lighter lines above and below the darker line are the basis plus and minus one standard deviation from the average. Basis (the cash minus futures market price difference) is most favorable for feeders in May and least favorable in September, both for steers and heifers. Note that cash prices exceed futures market prices in some months (a positive basis) but are lower than futures prices in other months (a negative basis).

Basis Contracting Process

During the cattle feeding process, a feeder and packer can enter into a basis contract. Usually, basis contracts can be agreed to when cattle are placed on feed or up until two weeks prior to delivery for slaughter. Essentially, a packer bids a basis, or cash-futures price difference, for fed cattle for the month in which cattle are expected to be slaughtered. Packers need not be concerned with the price level bid per se. Instead they need to be concerned with the expected relationship between cash and futures market prices. Price level is still important from a risk standpoint and will be discussed later.

The following is an example of a basis forward contract bid. Packers and feeders begin by determining the expected month in which cattle will be marketed for slaughter. In the example, steer cattle are assumed to be marketed in early-to-mid August. Step 1 is to estimate the August basis (Table 1). The seasonally adjusted, historical average basis for August in the Texas Panhandle is $-\$0.54/\text{cwt}$.

The packer (Step 2) estimates whether or not the expected basis will be above or below the historical basis. Assume the packer believes the cash market will be stronger than the futures market. This is to say that the futures market price is discounted somewhat from what the fundamental supply-demand conditions suggest, according to the packer bidding on cattle. In this example, the packer adds $\$0.25/\text{cwt}$ to the basis. If the cattle are higher-than-average quality, the packer may also adjust the basis upwards.

The packer also deducts a risk transfer premium. This is a less clear aspect of basis contracting than other parts of the process. A packer may not distinguish between a market adjustment to the historical basis and what we have called a risk transfer premium. The two are separated in Table 3 based on research findings. Research has indicated that forward contract prices are typically lower than cash market prices, after adjusting for cattle quality differences. Research over a wide geographic area and year-long period has shown this risk transfer premium to be substantial, perhaps \$1.50-

\$2/live cwt. (Ward, Koontz, and Schroeder). However, more research is needed to understand the details of this difference for specific locations and other time periods. In the Table 1 example, a \$0.50/cwt. risk premium is assumed.

After adjusting the historical basis for market factors and a risk transfer premium, the result is a basis bid. In this example, assume the basis bid is the adjusted basis rounded to the nearest \$0.05/cwt., or -\$0.80/cwt.

Step 3 belongs to the cattle feeder. First, assume the cattle feeder evaluates the basis bid and, if acceptable, agrees to sell cattle for that bid. Next, the feeder watches and studies the August live cattle futures market price. When the cattle feeder believes the futures market price has peaked or is sufficiently high, the feeder notifies the packer to price the cattle at that point. Note that the cattle were committed to the packer when the basis bid was accepted, but the sale price was not discovered or agreed upon, only the basis was agreed to or discovered. After the feeder picks the futures contract price, then selling price is discovered by default. In this example, assume the expected highest August live cattle futures market contract price was \$72/cwt. Then, the selling price is automatically discovered at the futures market price minus the contract basis (-\$0.80/cwt.), or \$71.20/cwt. Regardless, what happens to cash market or futures market prices between that time and delivery of the cattle, the sale price remains at \$71.20/cwt.

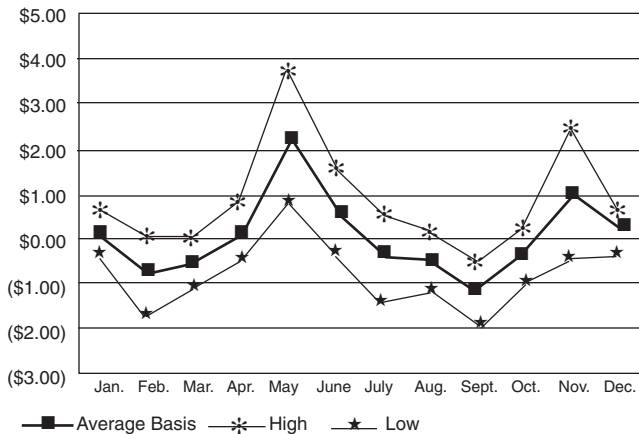


Figure 1. Fed Steer Basis, Amarillo, Texas, 1991-2000.

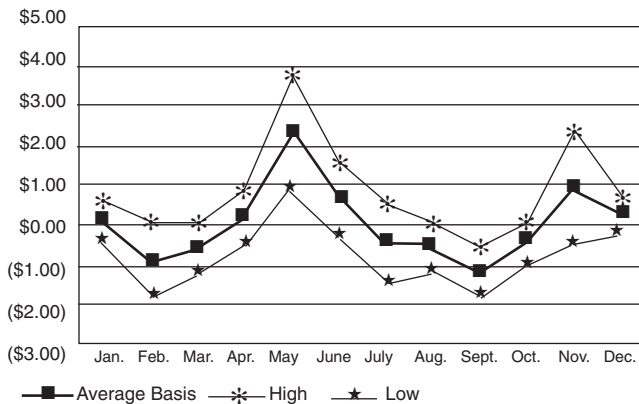


Figure 2. Fed Heifer Basis, Amarillo, Texas, 1991-2000.

Risk Premium and Basis Bidding

The risk transfer premium and the basis bidding process needs to be discussed a little more. Notice that the cattle were committed to the packer when the basis bid was accepted, but the price was not discovered or agreed upon, only the basis was agreed to or discovered. After the feeder picks the futures contract price, then the selling price is also discovered. In the example, assume the expected highest August live cattle futures market contract price was \$72/cwt. so then the transaction price was \$71.20/cwt. Notice the packer owns the cattle at that particular price. Packers seem to prefer basis contracts to fixed price contracts because they are able to secure supplies of fed cattle but they are not immediately priced. The packing business is a margin business and packers would prefer to not have the price of cattle locked in when the prices for the meat products are not locked in as well. After the feeder contacts the packer and establishes a price for the cattle, the packer will then likely hedge the animals. Since

Table 1. Basis Forward Contract Bid Example.

STEP 1: Begin with an Average August Basis	
Historical August Basis (Fed steers, Amarillo)	-\$0.54/cwt.
STEP 2: Adjust the Historical Basis	
Add a market adjustment factor	
Subtract a risk transfer premium	
Adjusted Historical Basis	
Basis Bid (rounded to the nearest five cents)	+0.25
	-0.50
	-0.79
	-\$0.80/cwt.
STEP 3: Feeder Picks the Live Cattle Futures Price	
"Estimated" Highest August Live Cattle Futures	\$72.00
Sale Price (\$72.00 - \$0.80)	\$71.20/cwt.

the hedger (the packer in this case) assumes basis risk, the packer builds in a risk transfer premium.

The packer implicitly deducts a risk transfer premium but a packer may not distinguish between an adjustment for historical basis and what we have called here a risk transfer premium. In the process of basis contracting, packers are assuming basis risk from feeders. Packers will pay a price for cattle that is a fixed difference (i.e., the basis) compared with the relevant futures market price. Thus, packers are assuming the basis risk; or feeders are transferring the basis risk to packers. Packers adjust the historical basis estimate by some amount that represents their added basis risk. Thus, the feeder and packer are negotiating what they think the actual basis will be in the delivery month and some cushion to protect the packer from basis risk. The more packers want to secure cattle for future delivery, the smaller the cushion will be, and the more cattle feeders want to forward sell, the larger the cushion. Feeders need to watch basis bids and compare them to historical information to know whether the bids are favorable or not.

Advantages, Disadvantages, Issues

Basis contracting has advantages and disadvantages for feeders and packers. For feeders, one advantage is locking in a buyer for their cattle and reducing any further costs of marketing cattle. The cattle have a "home." Feeders lock in a basis or cash-futures price difference and then can concentrate on the futures market price to pick when they believe it has peaked or when the price is sufficiently high. Basis contracts are especially attractive if fed cattle prices are expected to increase, as in the spring months. Research has indicated feeders may receive favorable financing terms if they forward price their cattle (Eilrich et al.).

Packers benefit by purchasing cattle in advance of their slaughter needs. They have a known quality of cattle, can reduce further procurement costs, and also have a locked-in cash-futures price difference. Basis forward contracts are especially attractive if packers anticipate needing cattle during times of reduced supplies.

Both feeders and packers are still vulnerable to price level changes. Hedging with futures market contracts or using futures market option contracts must eliminate price level risk. Both for feeders and packers, the cash-futures price difference or basis is known when the basis bid is accepted, but the price level at which cattle will be sold or purchased is not known unless the futures market price is also chosen at the time the basis bid is accepted. And sometimes feeders agree to use the futures market price available at the time the basis bid is accepted, rather than trying to estimate the highest expected futures market price.

Typically with cash market purchases, packers pay transportation costs from the feedlot to the packing plant. With forward contracts, feeders often pay transportation, though some packers may waive this requirement.

Basis contracts are typically for a specific set of cattle quality specifications. If actual cattle quality is lower than the contract specifications, cattle feeders can be penalized.

Specifications, and transportation costs, sometimes are negotiable. Feeders need to identify which contract terms are negotiable before entering into basis contracts.

A general disadvantage with basis forward contracts is that they do not move the industry toward value-based pricing, in and of themselves. If all cattle are sold at the same price, no consideration is given to within-pen quality differences. Poorer cattle receive a higher price than they deserve and better cattle are unnecessarily discounted. However, the basis price potentially could be used as the base price in grid pricing.

Criticisms of basis contracts are sometimes raised. First, the risk transfer premium may be larger than is originally apparent, and on average, basis contracts may be lower than expected compared with cash market prices. Given the timing of basis contract decisions, making a valid comparison between contract prices and cash market prices is not easy.

Prior to implementing mandatory price reporting, forward contract sales did not result in a discovered price that could be reported by market reporting services. Thus, forward contract prices could not be used as information for subsequent price discovery. Cash market prices, one part of the basis calculation, were then determined from fewer cash market sales.

Forward contracting removes cattle from the cash market supply and become "captive supplies" for packers. Captive supplies and their potential adverse effects have been a contentious issue in the beef industry for several years (see extension facts WF-554, Packer Concentration and Captive Supplies). The central question is whether or not packers use forward purchased cattle as bargaining leverage to reduce cash market transaction prices. If they do, cash market prices, again which are part of the calculation of basis, are lower and the basis is lower.

Conclusions

Basis forward contracting is another method of marketing and pricing fed cattle. It reduces basis risk but must be used with futures market hedging or options to simultaneously reduce price level risk. Some risk transfer premium is appropriate in basis contracting between feeders and packers because packers assume basis risk from feeders. Research to date suggests the transfer premium is relatively large, but more research is needed. Feeders using basis contracts should monitor how much sale prices differ for cattle marketed by basis contract compared with other marketing methods.

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